Cleanup Action Completion Report
Washington State Department of Natural Resources
Webster Nursery
Tumwater, Washington

May 29, 2020

Prepared for

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LIST OF ABBREVIATIONS AND ACRONYMS

AO ..... Agreed Order
bgs ..... below ground surface
CACR ..... cleanup action completion report
CAO ..... cleanup action objectives
CAP ..... cleanup action plan
CDF ..... controlled-density fill
CUL ..... cleanup level
DNR ..... Washington State Department of Natural Resources
Ecology ..... Washington State Department of Ecology
EIM ..... Ecology's Environmental Information Management database
EPA ..... US Environmental Protection Agency
ft ..... foot/feet
HE ..... heptachlor epoxide
LAI ..... Landau Associates, Inc.
µg/kg ..... micrograms per kilogram
MTCA ..... Model Toxics Control Act
RAWP ..... remedial action work plan
RCRA ..... Resource Conservation and Recovery Act
Site ..... Webster Nursery cleanup site
TESC ..... temporary erosion and sediment control
UST ..... underground storage tank
WAC ..... Washington Administrative Code

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1.0 INTRODUCTION

Landau Associates, Inc. (LAI) prepared this Cleanup Action Completion Report (CACR), which summarizes remedial action at the Washington State Department of Natural Resources (DNR) Webster Nursery cleanup site (Site) located south of Tumwater, Washington. The Site was defined by the extent of contamination caused by the release of organochlorine pesticides from an underground storage tank (UST). Persistent low concentrations of heptachlor epoxide (HE) have been identified in shallow groundwater near the previous UST location. The project location is shown on Figure 1.

The remedial action was completed in accordance with the Remedial Action Work Plan (RAWP; LAI 2017) and Agreed Order (AO) No. DE 13181, effective August 2016, between the Washington State Department of Ecology (Ecology) and DNR, consistent with the final Cleanup Action Plan (CAP) established by Ecology in August 2016 (Ecology 2016a, b). Prior to the 2016 CAP, DNR managed monitoring and compliance at the Site under a previous AO (No. DE 00 TCPSR-295, effective October 1998) and CAP issued by Ecology on January 8, 2001 (Ecology 2001).

The preferred cleanup alternative described in the 2016 CAP (Ecology 2016a, b) was removal of HE-affected soil near the water table to reduce the potential for back-diffusion of HE from soil to groundwater. This CACR presents the results of remedial activities at the Site.

2.0 SITE DESCRIPTION

Webster Nursery is an operating nursery located at 9805 Blomberg Street SW, in Thurston County, Washington, approximately 0.5 miles west of Interstate 5 (Figure 1). The Site consists of an area of contaminated soil and groundwater at the nursery that have been locally affected by a historical release of organochlorine pesticides from a UST located south of the former pesticide storage warehouse. The Site is accessible from Blomberg Street SW. The spatial extent of the Site is shown on Figure 2.

2.1 Physical Setting

The Site is generally flat, with a ground surface elevation of approximately 190 ft above mean sea level. Salmon Creek, located approximately 0.2 miles to the south, flows generally west to meet the Black River approximately 2.5 miles west of the Site (Figure 1).

Native soil encountered in borings at the Site generally consist of a thin (less than 0.2-ft-thick) layer of topsoil overlying approximately 4 to 6 ft of light brown, fine to medium sand with silt and organic material. With depth (below approximately 4 to 5 ft), soil grades to light brown, silty, fine sand and sandy silt (LAI 2016).

Groundwater below the Site is shallow and unconfined, with depth to water ranging from 4.2 to 11.3 feet (ft) below ground surface (bgs) in 2014. Groundwater levels fluctuate approximately 7 ft seasonally in response to surface conditions and precipitation. Although regional groundwater flow is likely to the west-northwest (Ecology 2001, LAI 2014b, Tetra Tech 1999), shallow groundwater flow at the Site is influenced by local surface conditions, runoff, and infiltration. Groundwater mounding has been interpreted in wells near the 1996 excavation area (Ecology 2016a).

2.2 Background

In 1978, a concrete UST was installed south of the former pesticide storage warehouse. The UST was historically used to contain washwater and spills from pesticide mixing operations at the nursery. The original concrete UST was replaced with a metal UST in 1982. During removal of the metal UST in July 1996, pesticide contamination was confirmed in soil and groundwater, and a remedial excavation was planned and completed in 1996. Groundwater seepage in the bottom of the excavation limited the horizontal and vertical extent of the excavation, so a smaller volume of soil was removed than planned. According to the 2001 CAP, approximately 70 cubic yards of contaminated soil was removed for disposal (Ecology 2001). The excavation depth was approximately 7 ft bgs. Field screening during excavation indicated soil contamination was left in place. The approximate location of the 1996 excavation area and soil and groundwater sampling locations are shown on Figure 2.

According to the 2001 CAP, the long-term timeframe for the Site remedy (monitored natural attenuation) was 5 to 10 years (Ecology 2001). However, HE concentrations in groundwater above the

Model Toxics Control Act (MTCA) Method B groundwater cleanup level (CUL) persisted at two monitoring wells: SW-10 and SW-11. These wells were located about 5 ft south and east of the 1996 excavation area margin, respectively, and were screened from approximately 6 to 16 ft bgs (LAI 2016). The persistence of HE concentrations in groundwater at these two monitoring locations led Ecology and DNR to further characterize the extent of residual pesticide contamination in soil (LAI 2014c).

HE is not mobile in the subsurface and has a low potential to leach into groundwater (Syracuse Research Corporation 2007). Consequently, the extent of HE in soil is interpreted from soil analytical results obtained from soil investigations conducted in 1999, 2014, and 2015. HE has been detected in soil below and immediately south and southeast of the 1996 excavation margins, with the highest concentrations occurring between about 4 and 10.5 ft bgs (LAI 2014a, 2016, Tetra Tech 1999). This depth interval corresponds with the seasonal range in groundwater elevations (LAI 2014a, b). In addition, at some locations, HE detections in soil at depths below the seasonal high water table exceeded the current MTCA Method B soil CUL for protection of groundwater (4.02 micrograms per kilogram [µg/kg]). The presence of HE in soil appears to correspond with groundwater contamination (LAI 2014a, 2016). Historical HE concentrations in soil and groundwater are presented on Figure 3.

2.3 Chemicals of Concern

HE (breakdown product of heptachlor) is the primary chemical of concern at the Site. Media of concern at the Site include soil and groundwater due to HE detections exceeding applicable CULs. Figures 2 and 3 show the horizontal and vertical extent of HE observed at the Site.

2.4 Cleanup Action Objectives and Standards

Cleanup action objectives (CAOs) and cleanup standards were initially established in the 2001 CAP (Ecology 2001). However, CULs have been revised by Ecology since the 2001 CAP took effect. The current CULs provided in Ecology's Cleanup Levels and Risk Calculation database (Ecology 2015) are applicable under the 2016 CAP. MTCA Method B CULs for groundwater and soil applicable at the Site are included in Table 1.

CAOs outlined in the CAP include:

- Human Health: Prevent exposure to groundwater exceeding contaminant-specific applicable or relevant and appropriate requirements in accordance with Washington Administrative Code (WAC) 173-340-360 and WAC 173-340-700
- Environmental Protection: Prevent migration of groundwater contamination at levels that could negatively affect Salmon Creek.

Additionally, DNR expressed a goal of expediting attainment of cleanup standards to the greatest extent practicable at the point of compliance. The point of compliance is defined as that portion of the subsurface impacted by leakage from the pesticide UST (Ecology 2001, 2016a). The selected remedy will strive to address each of these goals and objectives.

2.5 Remedial Action Conceptual Design

The selected remedial action described in the 2016 CAP seeks to remove HE concentrations that exceed CULs in shallow groundwater. The limited distribution of HE in groundwater at the Site suggested that low concentrations of HE were back-diffusing locally into shallow groundwater from affected soil near the water table. As a result, the selected cleanup action proposed to excavate soil located within the zone of seasonal groundwater fluctuation that contains HE at concentrations greater than the MTCA Method B soil CUL protective of groundwater (4.02 µg/kg).

Seasonally, the water table fluctuates over the interval between approximately 4 and 10.5 ft bgs. Therefore, the selected cleanup action targeted the region of soil enclosed by boring locations in which HE had been detected in soil at concentrations above the applicable 2016 soil CUL at depths between 4 and 10.5 ft bgs. Additionally, excavation targeted a deeper region in the immediate vicinity of boring LAI-B12, where past results indicated that HE concentrations exceeded the MTCA Method B soil CUL protective of groundwater to a depth of 15 ft bgs. An excavation cross section is shown on Figure 3. It is anticipated that removal of contaminated soil within the zone of seasonal groundwater fluctuation will eliminate the potential pathway from soil to groundwater and will result in groundwater compliance.

The primary components of the Site cleanup included:

- Implementation of temporary erosion and sediment control (TESC) best management practices
- Removal and stockpiling of clean soil for use as backfill
- Removal of contaminated soil
- Loading and transport of contaminated soils to a Subtitle D solid waste landfill for disposal
- Soil performance sampling and analysis to document performance of the remedial excavation
- Backfilling and compaction of the excavation with approved clean fill
- Site restoration.

Ecology determined that this selected remedy is protective of human health and the environment, and is permanent to the maximum extent practicable.

3.0 REMEDIAL ACTION IMPLEMENTATION

Remedial action consisting of excavation of contaminated soil near the water table was completed in general accordance with the CAP and RAWP. All field work was overseen by a licensed professional engineer. Based on the performance monitoring results and review of daily field reports, the engineer is of the opinion that the remedial action has been constructed in substantial compliance with the CAP, RAWP, and construction specifications. The area adjacent to the warehouse was excavated by advancing sheet piles for support; the area was backfilled with controlled-density fill (CDF). Excavated HE-contaminated soil was removed from the Site and disposed of at a Resource Conservation and Recovery Act (RCRA) Subtitle D solid waste landfill.

3.1 Deviations from the Remedial Action Work Plan

Due to conditions encountered in the field, several modifications to the RAWP were required. Details of the deviations are presented in Subsections 3.1.1 and 3.1.2 below.

3.1.1 Sequential Slot-Cutting Procedure

The RAWP described the anticipated excavation procedure, which included sequential excavation of "slots" in order to maintain structural support of the warehouse and attain the target depths. However, actual excavation procedures differed according to the contractor's means and methods to achieve the stated CAOs. The contractor excavated Slot F first, followed by Slot E, followed by the remaining Slots A through D (simultaneously). As planned, Slots A through D were backfilled with CDF and Slots E and F were backfilled with imported gravel fill and clean excavation soil.

3.1.2 Groundwater Monitoring Well Installation

The RAWP included the decommissioning of two wells, SW-10 and SW-11, and the installation of two replacement wells, SW-17 and SW-18. The contractor erroneously decommissioned SW-9 as well. Three replacement wells were installed after the completion of the remedial excavation and were designated with an "R" modifier in the well identification number (i.e., the replacement well for SW-10 is named SW-10R). Additional information regarding the installation of groundwater monitoring wells is included in Section 3.4.6 of this report.

3.2 Identification of Source Removal Excavation Area

The excavation area was based on the locations of historical soil sampling with analytical results exceeding CULs, as discussed in Section 2.5. Soil performance samples were collected from the excavation base and sidewalls to document conditions; however, due to the physical limitations on the excavation extent described in Section 2.2, soil contamination was not "chased" during excavation.

3.3 Permits, Approvals, and Notifications

The substantive requirements of a Thurston County Clearing and Grading Permit were addressed by project plans including a TESC Plan and a Stormwater Pollution Prevention Plan. A State Environmental Policy Act review has been completed for this project and reviewed by Ecology and the public in conjunction with the 2016 CAP (Ecology 2016a). No other permits or permit exemptions were sought for this project.

As all work was performed on property owned by DNR, access agreements were not required. Nursery staff were notified 1 week in advance of work by the DNR project manager. Additionally, nearby residents were notified by Ecology through standard public notification procedures consistent with the Public Participation Plan developed by Ecology per Condition VIII.G of the AO. Signs were placed at the Webster Nursery gate during work to remind staff and visitors of the active construction. A Site-specific Health and Safety Plan was also prepared both by LAI and the excavation contractor prior to excavation activities.

3.4 Source Removal Excavation, Disposal, and Soil Performance Sampling

This section describes the procedures for soil excavation and disposal, and soil performance sampling. Soil excavation began the week of July 30, 2018, and was completed the week of August 13, 2018. The excavation area is shown on Figure 4. Selected Site photographs taken during soil excavation activities are provided in Appendix A.

3.4.1 Site Preparation

Activities described below were completed prior to the start of excavation.

3.4.1.1 Monitoring Well Decommissioning

Existing monitoring wells SW-10 and SW-11 were located within the proposed excavation area and decommissioned by a licensed well driller according to regulation (WAC 173-160-460) prior to excavation. As stated in Section 3.1.2, monitoring well SW-9 was also decommissioned by mistake. Well decommissioning was completed July 30, 2018 and decommissioning records are provided in Appendix B.

3.4.1.2 Tree Removal

The contractor removed trees as needed to accommodate necessary equipment for excavation activities, as well as a small direct-push drill rig to install monitoring wells after completing the excavation. Six trees were felled and no stumps were removed as part of the remedial excavation preparation.

3.4.2 Soil Excavation and Slot Cutting Procedure

Soil was removed by the contractor using a trackhoe and transported to the Republic Services Roosevelt Regional Municipal Solid Waste Landfill in Roosevelt, Washington. LAI representatives were on Site during excavation to observe and document excavation activities, collect excavation soil samples, and document project progress.

Approximately 277 tons (about 252 cubic yards in trucks) of soil was excavated and removed for offsite disposal from an area of approximately 575 square feet. Specifically, the excavation removed:

- Native soil between 3 ft and 10.5 ft bgs in the approximately 25-ft by 23-ft area enclosed by boring locations in which HE had been detected at concentrations above applicable CULs
- Native soil from 10.5 ft to 15 ft bgs in an approximately 6-ft by 6-ft area near boring LAI-B12 (Figures 3 and 4).

The northern extent of excavation was physically limited by structural constraints (i.e., warehouse building). During excavation, geographical coordinates for each corner of the excavation were recorded using a portable GPS unit. The excavation extent is shown on Figure 4 and contractor-prepared as-built drawings are provided in Appendix C. Construction was completed during a period forecasted to have little or no precipitation to minimize the potential for dewatering, erosion, and soil caving. Groundwater was encountered at a depth of approximately 10 ft bgs within the excavation, but infiltration occurred slowly enough that construction dewatering was not required to reach the full depth of soil removal. Excavation and soil management was conducted with standard construction equipment (tracked backhoe), aided by sheet piles. A geotechnical engineer observed excavation activities and provided guidance and recommendations regarding the extent of excavation and excavation side slopes.

3.4.3 Importing and Verifying Clean Soil

Excavated soil presumed to be unaffected by contaminants released from the UST was stockpiled and sampled. This soil included:

- Soil excavated from 0 ft to 3 ft bgs across the proposed excavation area (identified as overburden)
- Excavated backfill material used to fill the 1996 excavation area to a presumed depth of 6 ft bgs, as it was readily identifiable from native soil using physical characteristics (such as soil color and texture) during excavation. The 1996 excavation area fill consisted of fine to coarse gravel with sand, cobbles, and abundant debris including concrete chunks, rebar, and plastic sheeting.

Clean soil, as defined above, was excavated independent of deeper (contaminated) soil, directed to a specially identified stockpile location, and properly contained and sampled. The excavation was backfilled with clean excavated soil and clean imported fill comparable to surrounding soil. The fill was placed in approximately 8- to 12-inch lifts and compacted to an unyielding condition. Filling and

compacting were terminated when final Site grades were approximately equivalent to existing Site grades.

3.4.4 Management and Disposal of Excavated Soil

Excavated contaminated soil was loaded directly into bins and transported by truck to an RCRA Subtitle D solid waste disposal facility for proper disposal. As indicated in Ecology's Contained-Out Determination letter dated July 18, 2018, contaminated soil at the Site does not warrant management as dangerous waste (Ecology 2018).

The total amount of excavated soil transported for offsite disposal was approximately 277 tons, which included soil cuttings generated from the 2015 soil investigation stored in one 20-gallon drum. A summary of soil sent offsite for disposal, disposal tickets, and a copy of Ecology's Contained-Out Determination letter are provided in Appendix D.

3.4.5 Soil Sampling Procedures, Analysis and Results

Soil performance samples were collected from the excavation bottom and sidewalls (soil performance monitoring), and from imported fill and excavated soil stockpiles to confirm clean conditions prior to use as excavation backfill material (stockpile sampling). Soil sampling procedures, analysis, and analytical results for performance monitoring and stockpile sampling are described below in Sections 3.4.5.2 and 3.4.5.3, respectively.

3.4.5.1 Sample Labeling

Each performance soil sample was identified by a unique sample designation. The sample designation was included on the soil sample container and on the corresponding sample collection form. The designation system included the sequential sample number of each sidewall or base sample and spatial information about the sample, as described below.

Excavation sidewall sample SW1-N-6, where:

- "SW" indicates sample was collected from the excavation sidewall
- "1" is the sequential sidewall sample number
- "N" indicates compass direction of the excavation sidewall
- "6" is the approximate depth in feet below original grade.

Thus, sample SW1-N-6 identifies the first sidewall sample and indicates the sample was collected from the north sidewall at a depth of approximately 6 ft below the original grade.

Excavation base sample B1-A-10.5, where:

- "B" indicates sample was collected from the excavation base
- "1" is the sequential base sample number

- "A" is the slot identifier or location
- "10.5" is the approximate depth in feet below original grade.

Thus, sample B1-A-10.5 identifies the first base sample and indicates the sample was collected from Slot A (or location A) at a depth of approximately 10.5 ft below the original grade.

3.4.5.2 Performance Monitoring

Soil performance monitoring was conducted during excavation. Four discrete excavation soil samples were collected from the top 6 inches of undisturbed soil from the base of the excavation. Base samples were collected approximately near the center of each slot. Additionally, one discrete excavation soil sample was collected from each of the north, west, and east sidewalls, and two excavation soil samples were collected from the south exterior sidewall, at depths corresponding to the depth of the maximum HE detection near each sample. Excavation soil samples were collected using the excavator bucket and decontaminated stainless steel sampling utensils; however, due to access constraints, the north sidewall sample (SW3-N-6.5) was collected using a hand auger prior to reaching the final excavation depth. One blind field duplicate soil sample (SW9-S-5.5) was collected during excavation at excavation soil sampling location SW4-S-5.5. Each soil sample was placed directly into a clean laboratory-provided sample container and stored in a cooler with ice until delivery to the analytical laboratory. Soil performance samples were submitted to TestAmerica, Inc. located in Tacoma, Washington, for analysis for organochlorine pesticides by US Environmental Protection Agency (EPA) Method 8081A with a standard turnaround time. Soil sampling locations were measured from fixed Site features (e.g., structures and monitoring wells) and plotted on a Site map in the field. Soil performance sampling locations are shown on Figure 4.

Soil data were screened using the current MTCA Method B groundwater CULs for applicable constituents. The primary constituent of concern at the Site is HE. Results are summarized below.

- Base sample B4-A-10.5, and sidewall samples SW1-W-8, SW3-N-6.5, SW4-S-5.5, and SW5-W-6.5 were non-detect for all constituents.
- Technical chlordane was detected in base samples B2-A-10.5 and B3-F-10.5 at concentrations of 330 µg/kg and 2,300 µg/kg, respectively, which exceeded the saturated zone CUL (103 µg/kg).
- Heptachlor was detected in base sample B3-F-10.5 at a concentration of 4.9 µg/kg, which exceeded the saturated zone CUL (1.9 µg/kg).
- HE was detected in base samples B1-E-15, B2-A-10.5, B3-F-10.5, and sidewall sample SW2-N-6.5 at concentrations ranging between 11 µg/kg and 49 µg/kg, which exceeded the saturated zone CUL (4.02 µg/kg). The highest concentration (49 µg/kg) was detected at location B3-F-10.5.

Soil performance sample results, provided in Table 2 and in Appendix E, indicate that soil impacted with concentrations of heptachlor and HE remain onsite and institutional controls, in the form of an environmental covenant, will be required at the Site. The purpose of the environmental covenant is to

notify personnel involved in potential future ground-disturbing work of contaminated soil and groundwater conditions. The covenant will include the following:

- Notification to Ecology prior to any ground-disturbing activities
- Identification of potentially contaminated soil
- Health and safety protocols
- Soil handling and disposal
- Recordkeeping.

3.4.5.3 Stockpile Sampling

Clean, excavated soil and imported fill were stockpiled on Site for use as backfill. The contractor was required to obtain confirmation of the non-contaminated nature of imported clean fill from the supplier, as well as the CDF aggregate source material. Imported fill consisting of gravel borrow was supplied by Black Lake Resources, located in Tumwater, Washington. CDF was obtained from Miles Sand & Gravel of Puyallup, Washington. The supplier analytical results and the imported fill specifications are provided in Appendix F.

Additionally, LAI confirmed the non-contaminated nature of imported clean fill (not including CDF) by collecting and analyzing two six-point composite soil samples (IM-SP-1-Comp and IM-SP-2-Comp) from the imported clean fill stockpiles for pesticides using EPA Method 8081B. These results are provided in Table 3 and included in Appendix E.

To confirm the non-contaminated nature of excavated soil that was expected to be clean, two six-point composite soil samples collected from the excavated clean soil stockpile were analyzed for pesticides using EPA Method 8081B with an expedited (72-hour) turnaround time. EX-SP-1-Comp was collected from the 0- to 3-ft bgs overburden stockpile and EX-SP-2-Comp was from the 3- 6-ft bgs 1996 excavation material stockpile. In both samples, HE, heptachlor, and technical chlordane were detected at concentrations exceeding the saturated zone CULs. However, constituent concentrations in the sample collected from the 0- 3-ft bgs overburden stockpile (EX-SP-1-Comp) did not exceed the vadose zone CULs. Therefore, the overburden stockpile was cleared for use as backfill for the excavation within the vadose zone (i.e., 0 to 4 ft bgs). Constituent concentrations in the sample collected from the 3- 6-ft 1996 excavation material stockpile also exceeded the vadose zone CULs and the stockpile was handled and disposed of in the same manner as contaminated soil. Additional clean backfill material was imported to compensate for the lost volume. Results of the excavated stockpile confirmation sampling are provided in Table 3 and included in Appendix E.

3.4.5.4 Environmental Information Management Submittal

A submittal to Ecology's Environmental Information Management (EIM) database will be prepared and submitted along with this report to Ecology. The EIM submittal will include performance monitoring

and stockpile sampling data representing current conditions (i.e., the stockpile sample of material that was rejected for use as fill material will not be included).

3.4.6 Drilling, Installation and Development of New Monitoring Wells

Three new monitoring wells were installed to replace decommissioned wells SW-9, SW-10, and SW-11. The new monitoring wells were drilled and installed using direct-push drilling equipment by Cascade Drilling, located in Clackamas, Oregon. The new wells were developed 24 or more hours after installation. To be comparable to the existing wells, the replacement wells were located south (SW-10R, approximately 10 ft south of the excavation), west (SW-9R, at the approximate location of SW-9), and east (SW-11R, approximately 20 ft east of the excavation) of the excavation and screened from approximately 6 ft to 16 ft bgs. Wells were constructed of 2-inch-diameter, Schedule 40 PVC, with 0.010-inch slot, prepacked PVC screen (using 20/40 stainless steel mesh and 10/20 silica sand), and flush-mount monuments. The replacement wells for SW-9, SW-10, and SW-11 were identified as SW-9R, SW-10R, and SW-11R, respectively. Well locations are shown on Figure 5. Driller and consultant well logs are provided in Appendix G. A survey of all wells (new and existing) was completed by DNR on August 27, 2018; well survey coordinates, including the top of casing elevations, are provided in Table 4.

3.4.7 Recordkeeping

Daily field reports were prepared to record the progress of the excavation and other activities. These reports included descriptions of contractor activity oversight and excavation soil sampling. A sample collection form was prepared for each excavation soil sample collected.

3.4.8 Equipment Decontamination

All field sampling equipment, including stainless steel bowls, stainless steel spoons, etc., were decontaminated in the following manner:

- Initial tap water rinse to remove large soil particles, if applicable
- Alconox® and tap water wash
- Tap water rinse
- De-ionized water rinse.

4.0 SITE RESTORATION

After completion of drilling, excavation, and filling/grading activities, the Site was restored by seeding with a permanent seed mix. Restoration was performed in general accordance with the applicable guidelines set forth in Ecology's Stormwater Management Manual for Western Washington (Ecology 2014).

5.0 GROUNDWATER PERFORMANCE MONITORING PLAN

Four consecutive quarters of groundwater performance sampling were conducted at Site monitoring wells. The groundwater monitoring plan included new wells SW-9R, SW-10R, and SW-11R, as well as three existing water quality monitoring wells designated SW-14, SW-15, and SW-16. Three additional monitoring wells, SW-1, SW-12, and SW-13, were measured for groundwater elevation. The first groundwater monitoring event was completed August 29, 2018 and results were presented in a separate technical memorandum, and quarterly, from then on.

Quarterly groundwater performance monitoring is ongoing. A Compliance Monitoring Plan was prepared under separate cover (LAI 2020) to document performance monitoring and other compliance monitoring requirements.

6.0 SUMMARY

This Cleanup Action Completion Report presents a summary of environmental investigations and remediation at the DNR Webster Nursery Site in Tumwater, Washington through August 2018. Cleanup of the Site has been conducted in accordance with the RAWP (LAI 2017), CAP (Ecology 2016a, b), and AO (No. DE 13181) between Ecology and DNR. As described in this report, the primary objective of the 2018 remedial action excavation was to remove soil that contained concentrations of HE greater than applicable soil CULs for protection of groundwater. Due to Site constraints (i.e., warehouse, groundwater), the extent of the excavation was predetermined and consisted of an approximately 575 square-foot area south of the warehouse to depths of either 10.5 ft or 15 ft bgs.

The extent and depth of the soil excavation area were determined based on the analytical results for soil samples collected during previous Site characterization events. In total, approximately 277 tons (approximately 252 cubic yards) of soil and debris were excavated and disposed of during the remedial excavation project. Due to the aforementioned constraints, compliance with the soil CULs was not required prior to backfilling the excavation area; soil performance sampling data are used only to document conditions. Final excavation depths were confirmed by field measurements/ observations. Soil performance sampling locations representing soil remaining in place within the final excavation area are shown on Figure 4. The excavation was backfilled with clean imported fill, as well as clean excavated material in the vadose zone.

Results of the soil performance sampling indicate that technical chlordane, heptachlor, and HE remain at concentrations exceeding the soil CULs for protection of groundwater, primarily in base samples. The highest concentrations of those constituents were detected in base sample B3-F-10.5; the technical chlordane concentration was 2,300 µg/kg, the heptachlor concentration was 4.9 µg/kg, and the HE concentration was 49 µg/kg. An environmental covenant will be required to provide restrictions for potential future ground-disturbing work at the Site.

After completion of the remedial excavation, three replacement groundwater monitoring wells were installed (SW-9R, SW-10R, and SW-11R). Along with other existing water quality monitoring wells (SW-14, SW-15, and SW-16), these wells will be sampled quarterly and results will be presented in supplemental memoranda.

7.0 USE OF THIS REPORT

This Cleanup Action Completion Report has been prepared for the exclusive use of the Washington State Department of Natural Resources and applicable regulatory agencies for specific application to the 2018 Webster Nursery cleanup project. No other party is entitled to rely on the information included in this document without the express written consent of LAI. Further, the reuse of information provided herein for extensions of the project or for any other project, without review and authorization by LAI, shall be at the user's sole risk. LAI warrants that within the limitations of scope, schedule, and budget, our services have been provided in a manner consistent with that level of care and skill ordinarily exercised by members of the profession currently practicing in the same locality under similar conditions as this project. LAI makes no other warranty, either express or implied.

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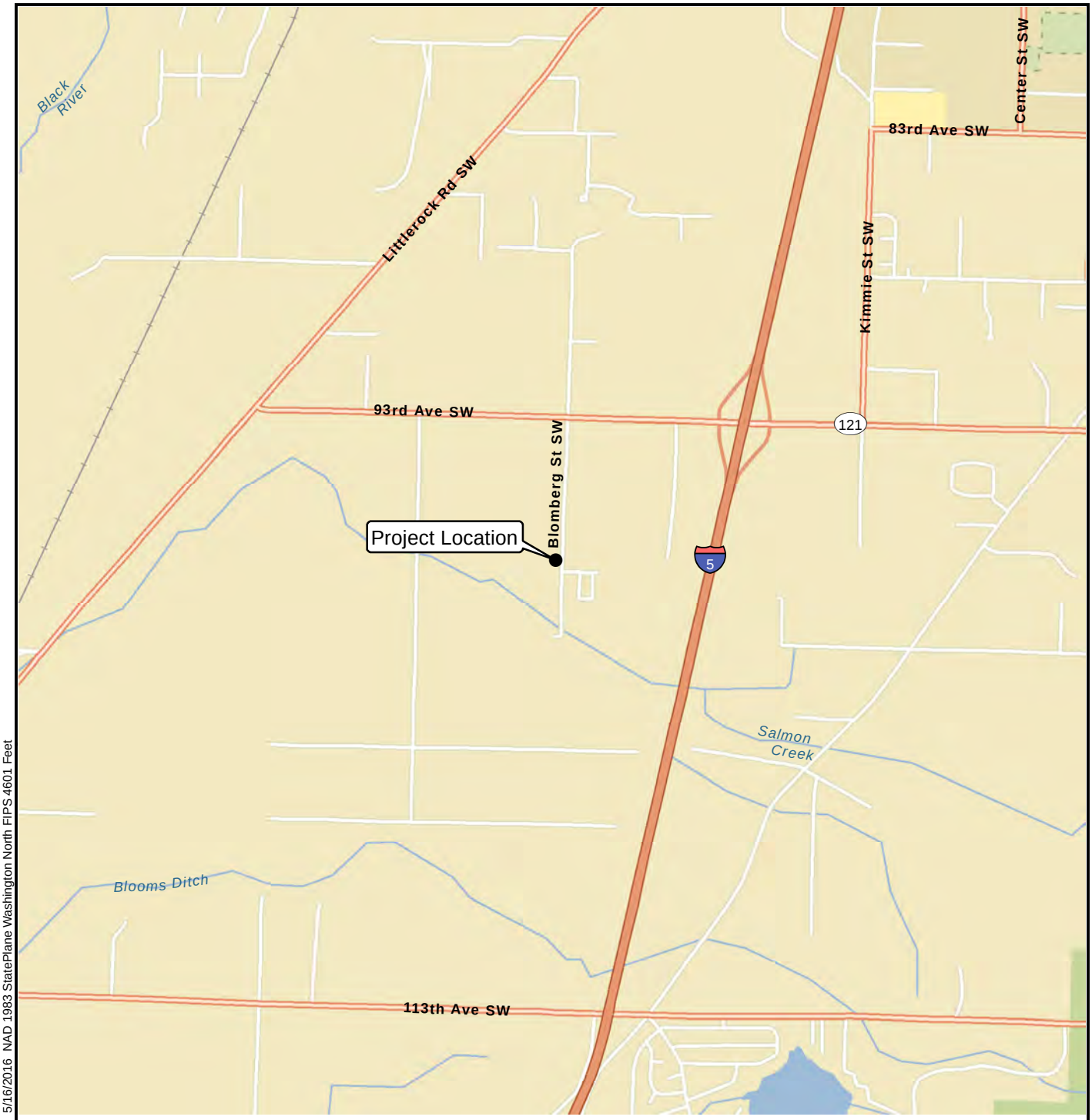


N

0 0.5 1

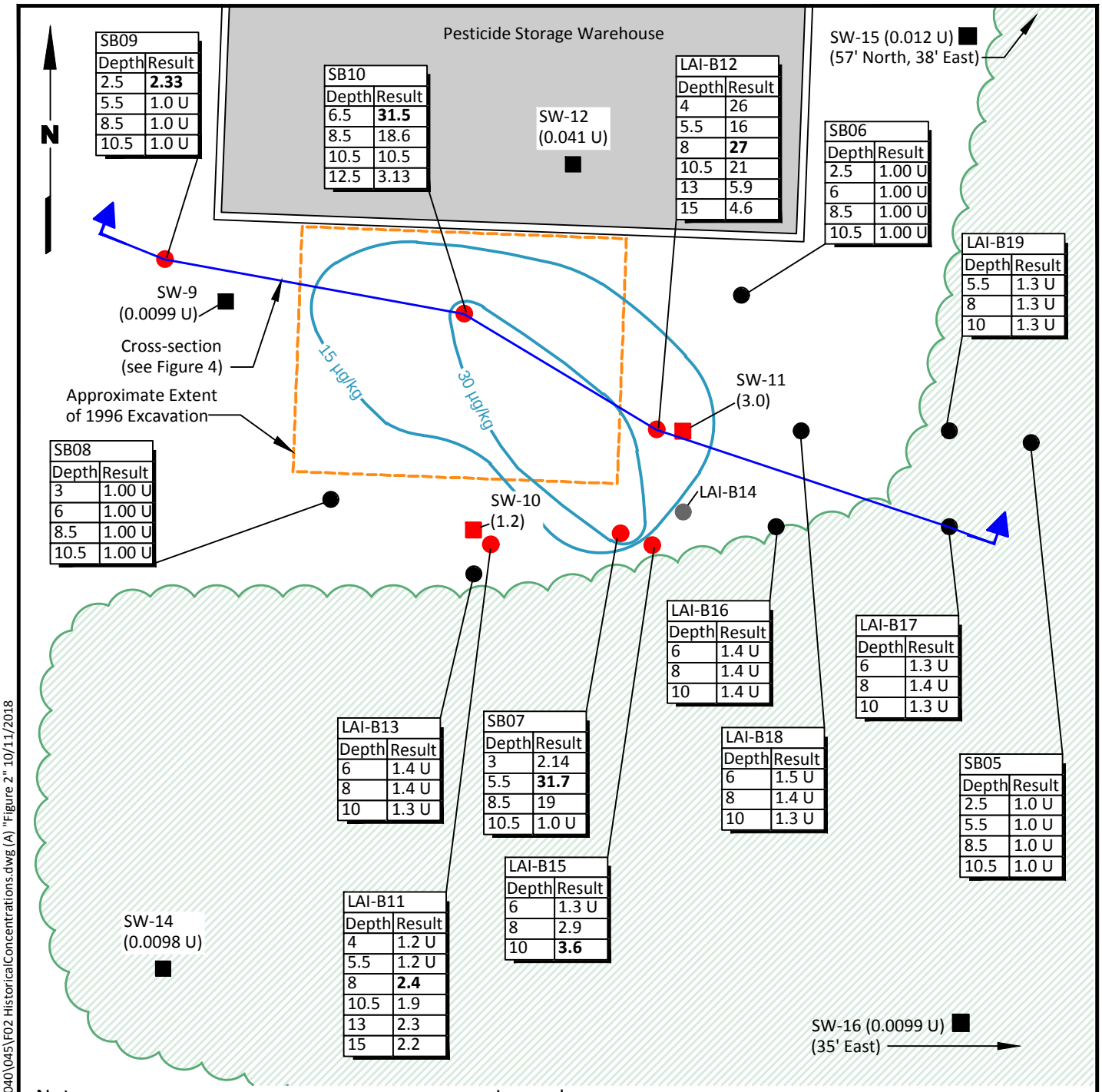
Miles

Data Source: Esri 2012

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

LANDAU ASSOCIATES

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



Notes

1. Depth measured in feet below ground surface.
2. Soil concentrations in micrograms per kilogram (µg/kg); bold indicates maximum.
3. Groundwater concentrations are most recent result, in micrograms per liter (µg/L).
4. U = indicates the compound was not detected at the reported concentration.
5. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Source: Tetra Tech, 1999

Legend

Location Type:
- Soil Boring
- Groundwater Monitoring Well
- Soil Concentration Contour
- Treed Area

Heptachlor Epoxide Results:
- Detected
- Not Detected
- Not Analyzed

0 10 20
Scale in Feet

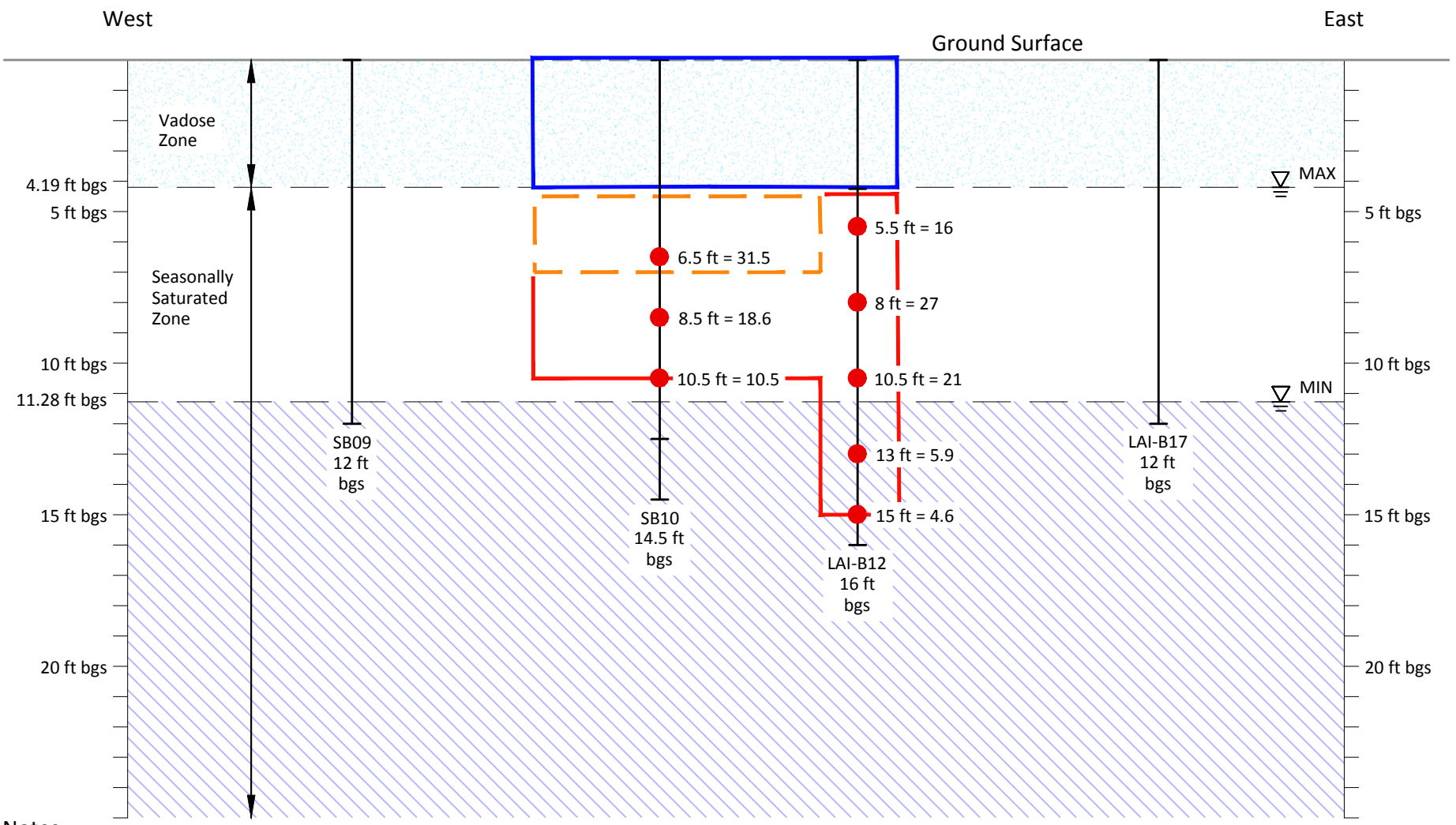
LANDAU ASSOCIATES, INC. | G:\Projects\774\006\040\045\F02 HistoricalConcentrations.dwg (A) "Figure 2" 10/11/2018

LANDAU ASSOCIATES

Webster Nursery Site
Tumwater, Washington

Historical Heptachlor Epoxide Concentrations in Soil and Groundwater

Figure 2



Notes

1. Maximum Water Level = 4.19 bgs (Feb 2014), Minimum Water Level = 11.28 bgs (Sept 2014).
2. Surface elevation approx. 193 ft.
3. Ground surface elevations obtained from GoogleEarth, vertical datum unknown.
4. Soil concentrations in micrograms per kilogram (µg/kg)
5. Exceedance indicates a location where HE concentration in soil exceeds the MTCA Method B soil cleanup level for protection of groundwater.
6. Backfill in 1996 excavation was sampled and managed as contaminated soil.
7. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Legend

- Exceedance
- Contaminated Backfill of 1996 Excavation
- Clean Overburden
- Planned Excavation and Disposal

0 10 20

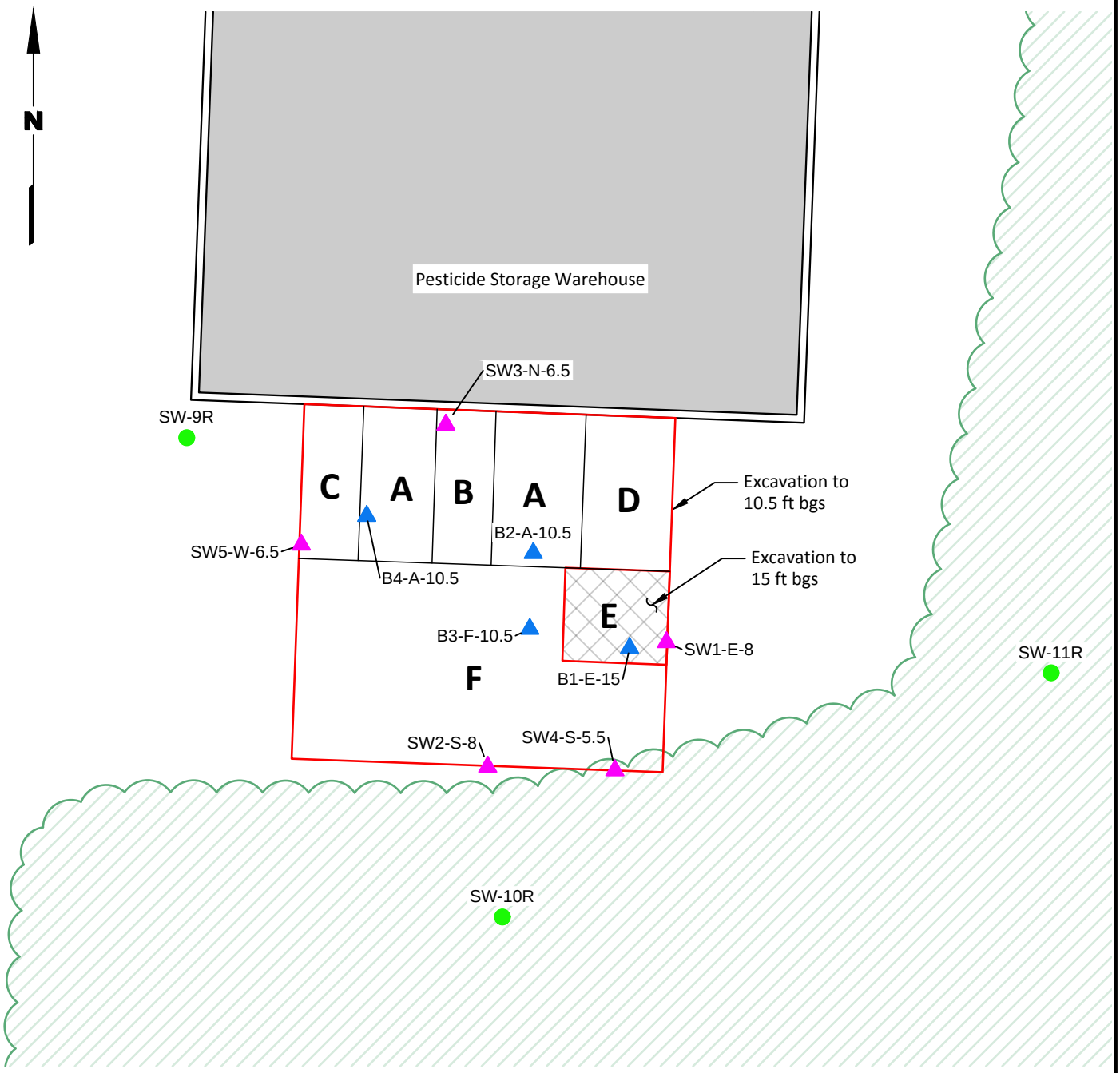
Horizontal Scale: 1" = 10'
Vertical Scale: 1" = 5'
2x vertical exaggeration

LANDAU ASSOCIATES

Webster Nursery Site
Tumwater, Washington

Conceptual Cross Section of Completed Remedial Action

Figure 3



Notes

1. "ft bgs" = feet below ground surface.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

0 10 20

Scale in Feet

Legend

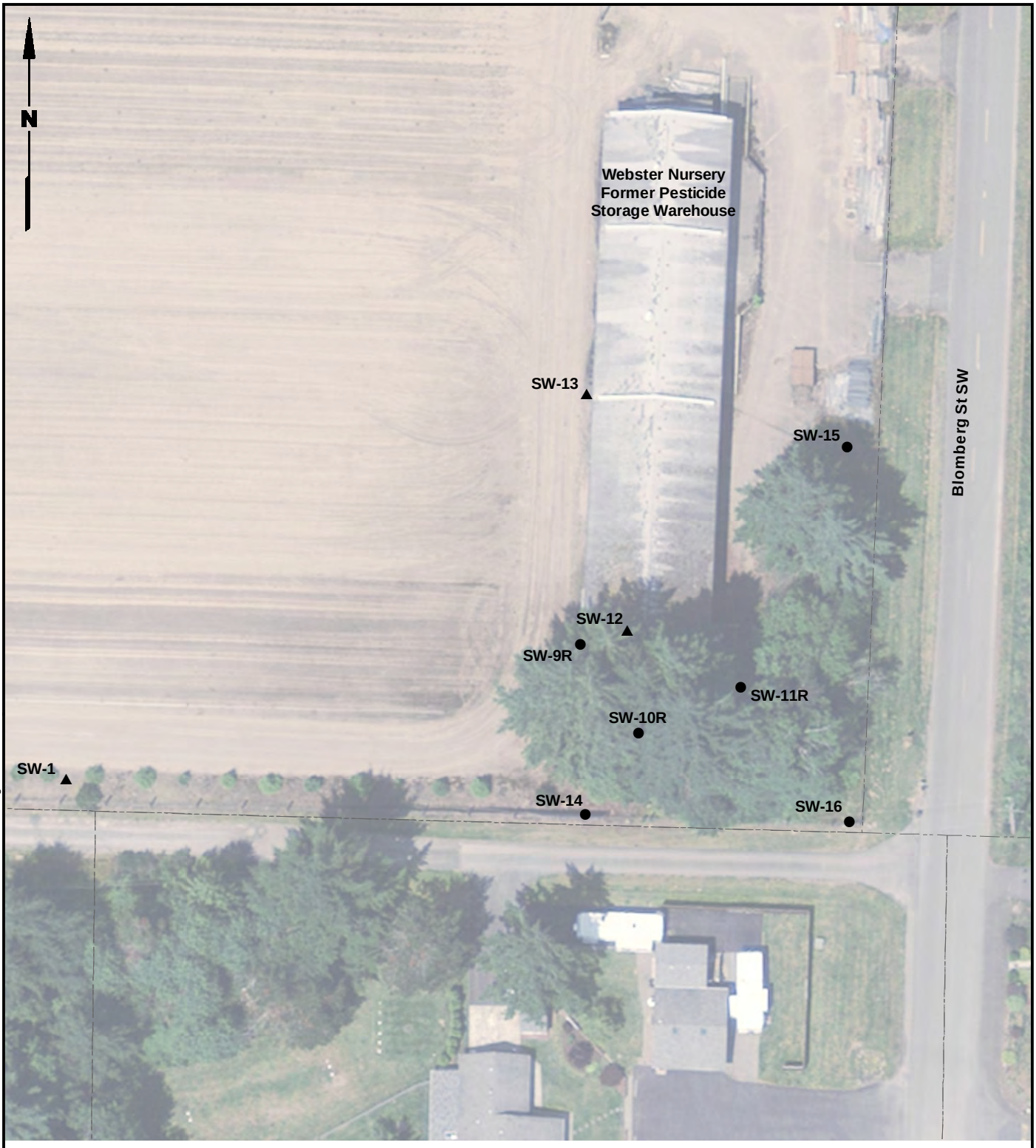
Location Type:

- Replacement Monitoring Well
- Slot Base Soil Performance Sample and Depth
- Sidewall Soil Performance Sample and Depth
- Tree Canopy Area

Source: Tetra Tech, 1999

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Soil Performance Sampling Detail**	Figure 4



Legend

- Pesticide Monitoring Well
- Other Monitoring Well
- Tax Parcels

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\045\F05 GroundwaterWellNetwork.mxd 10/12/2018 NAD 1983 StatePlane Washington South FIPS 4602 Feet

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Groundwater Monitoring Well Network**	Figure 5

Table 1
Model Toxics Control Act Method B Cleanup Levels
Webster Nursery – Tumwater, Washington

Chemical Name	CAS #	Soil Direct Contact MTCA Method B Non cancer (mg/kg)	Soil Direct Contact MTCA Method B Cancer (mg/kg)	Soil Protective of Groundwater Vadose @ 25 degrees C (mg/kg)	Soil Protective of Groundwater Saturated (mg/kg)	Soil TEE Soil Biota (mg/kg)	Soil TEE Wildlife (mg/kg)	Soil CUL in Final Units Vadose Zone (µg/kg)	Soil CUL in Final Units Saturated Zone (µg/kg)	Groundwater MTCA Method B Non cancer (µg/L)	Groundwater MTCA Method B Cancer (µg/L)
Atrazine	1912-24-9	2.80E+03	4.35E+00					4.35E+03	4.35E+03	5.60E+02	3.80E-01
Chlordane	57-74-9	4.00E+01	2.86E+00	2.06E+00	1.03E-01	1.00E+00	2.70E+00	2.06E+03	1.03E+02	8.00E+00	2.50E-01
Dicamba	1918-00-9	2.40E+03						2.40E+06	2.40E+06	4.80E+02	
Heptachlor	76-44-8	4.00E+01	2.22E-01	3.78E-02	1.90E-03		0.4[a]	3.78E+01	1.90E+00	8.00E+00	1.94E-02
Heptachlor Epoxide	1024-57-3	1.04E+00	1.10E-01	8.02E-02	4.02E-03		0.4[a]	8.02E+01	4.02E+00	1.04E-01	4.81E-03
Picloram	1918-02-1	5.60E+03						5.60E+06	5.60E+06	1.12E+03	
Simazine	122-34-9	4.00E+02	8.33E+00					8.33E+03	8.33E+03	8.00E+01	7.29E-01
2,4,5-Trichlorophenoxy	93-72-1	6.40E+02						6.40E+05	6.40E+05	1.28E+02	
2,4-Dichlorophenol	94-75-7	8.00E+02									
2,4,5 Trichlorophenol	93-76-5	8.00E+02									

Notes:

All cleanup criteria are from Ecology's Cleanup Levels and Risk Calculation Database, except for the TEE values which are from WAC 173-340-900, Table 749-3.
Green shading = selected CUL

[a] Total heptachlor and heptachlor epoxide

Abbreviations/Acronyms:

CUL = cleanup level
Ecology = Washington State Department of Ecology
mg/kg = milligrams per kilogram
µg/kg = micrograms per kilogram
µg/L = micrograms per liter
MTCA = Model Toxics Control Act
TEE = terrestrial ecological evaluation
WAC = Washington Administrative Code

Table 2
Soil Performance Sample Analytical Results
Webster Nursery – Tumwater, Washington

Analyte	Saturated Zone Soil Cleanup Level	Sample Location, Sample Depth (bgs), Laboratory SDG, Sample Date									
		B1-E 15 ft 580-79307-1 8/2/2018	B2-A 10.5 ft 580-79307-1 8/2/2018	B3-F 10.5 ft 580-79307-1 8/2/2018	B4-A 10.5 ft 580-79307-1 8/2/2018	SW1-E 8 ft 580-79307-1 8/2/2018	SW2-S 8 ft 580-79307-1 8/2/2018	SW3-N 6.5 ft 580-79307-1 8/2/2018	SW4-S 5.5 ft 580-79508-1 8/8/2018	SW5-W 6.5 ft 580-79307-1 8/2/2018	SW9-S 5.5 ft 580-79508-1 8/8/2018
Pesticides (µg/kg; SW-846 8081B)											
4,4'-DDD	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
4,4'-DDE	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
4,4'-DDT	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 UJ	2.4 U	2.4 UJ
Aldrin	--	4.1 U	4.1 U	4.3 U	3.6 U	4.3 U	4.1 U	4.0 U	3.6 U	3.5 U	3.6 U
alpha-BHC	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
beta-BHC	--	6.8 U	6.9 U	7.2 U	6.1 U	7.1 U	6.8 U	6.6 U	6.0 U	5.9 U	6.1 U
Chlordane, Technical	103	14 U	**330**	**2300**	12 U	14 U	14 U	13 U	12 U	12 U	12 U
cis-Chlordane	--	2.7 U	**26**	**140**	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
delta-BHC	--	4.1 U	4.1 U	4.3 U	3.6 U	4.3 U	4.1 U	4.0 U	3.6 U	3.5 U	3.6 U
Dieldrin	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
Endosulfan I	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
Endosulfan II	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
Endosulfan Sulfate	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 UJ	2.4 U	2.4 U
Endrin	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
Endrin Aldehyde	--	27 UJ	28 UJ	29 UJ	24 UJ	28 UJ	27 UJ	26 UJ	24 U	24 UJ	24 U
Endrin Ketone	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
gamma-BHC	--	2.7 U	2.8 U	2.9 U	2.4 U	2.8 U	2.7 U	2.6 U	2.4 U	2.4 U	2.4 U
Heptachlor	1.9	4.1 U	4.1 U	**4.9**	3.6 U	4.3 U	4.1 U	4.0 U	3.6 UJ	3.5 U	3.6 U
Heptachlor Epoxide	4.02	**11**	**16**	**49**	3.6 U	4.3 U	**11**	4.0 U	3.6 U	3.5 U	3.6 U
Methoxychlor	--	14 U	14 U	14 U	12 U	14 U	14 U	13 U	12 U	12 U	12 U
Toxaphene	--	140 U	140 U	140 U	120 U	140 U	140 U	130 U	120 U	120 U	120 U
trans-Chlordane	--	**15**	**130**	**730**	3.6 U	4.3 U	4.1 U	4.0 U	3.6 U	3.5 U	3.6 U

Notes:

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

UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be

Bold = detected compound

Green Box = detected concentration is greater than the cleanup level

-- = not available

Abbreviations and Acronyms:

µg/kg = micrograms per kilogram

bgs = below ground surface

ft = feet

SDG = sample delivery group

Table 3
Soil Stockpile Analytical Results
Webster Nursery – Tumwater, Washington

Analyte	Soil Cleanup Level Vadose Zone	Soil Cleanup Level Saturated Zone	Sample Location, Laboratory SDG, Sample Date			
			EX-SP-1-Comp 580-79252-1 8/1/2018	EX-SP-2-Comp 580-79307-2 8/2/2018	IM-SP-1-Comp 580-79271-1 7/31/2018	IM-SP-2-Comp 580-79271-1 7/31/2018
Pesticides (µg/kg; SW-846 8081B)						
4,4'-DDD	--	--	2.1 U	2.2 U	2.1 U	2.1 U
4,4'-DDE	--	--	2.1 UJ	2.2 U	2.1 UJ	2.1 UJ
4,4'-DDT	--	--	2.1 U	2.2 U	2.1 U	2.1 U
Aldrin	--	--	3.2 U	3.2 U	3.2 U	3.2 U
alpha-BHC	--	--	2.1 UJ	2.2 U	2.1 UJ	2.1 UJ
beta-BHC	--	--	5.4 U	5.4 U	5.3 U	5.3 U
Chlordane, Technical	2,060	103	**200**	**1,500**	11 U	11 U
cis-Chlordane	--	--	**14 J**	**33**	2.1 U	2.1 U
delta-BHC	--	--	3.2 U	3.2 U	3.2 U	3.2 U
Dieldrin	--	--	2.1 UJ	2.2 U	2.1 UJ	2.1 UJ
Endosulfan I	--	--	2.1 U	2.2 U	2.1 U	2.1 U
Endosulfan II	--	--	2.1 U	2.2 U	2.1 U	2.1 U
Endosulfan Sulfate	--	--	2.1 UJ	2.2 U	2.1 UJ	2.1 UJ
Endrin	--	--	2.1 U	2.2 U	2.1 U	2.1 U
Endrin Aldehyde	--	--	21 UJ	22 UJ	21 UJ	21 UJ
Endrin Ketone	--	--	2.1 U	2.2 U	2.1 U	2.1 U
gamma-BHC	--	--	2.1 U	2.2 U	2.1 U	2.1 U
Heptachlor	38	1.9	**13**	**89**	3.2 U	3.2 U
Heptachlor Epoxide	80	4.0	**58 J**	**130**	3.2 U	3.2 U
Methoxychlor	--	--	11 U	11 U	11 U	11 U
Toxaphene	--	--	110 U	110 U	110 U	110 U
trans-Chlordane	--	--	**43**	**230**	3.2 U	3.2 U

Notes:

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.
UJ = The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
Bold = detected compound
-- = not available

Blue Box = detected concentration is greater than the saturated zone cleanup level

Purple Box = detected concentration is greater than both the vadose and saturated zone cleanup levels

Abbreviations and Acronyms:

µg/kg = micrograms per kilogram
SDG = sample delivery group

Table 4
Well Survey Coordinates
Webster Nursery – Tumwater, Washington

Well ID	Coordinates		Top of Casing Elevation (ft)
	Northing	Easting	
SW-1	597438.835	1028221.024	193.22
SW-9R	597467.388	1028402.255	192.62
SW-10R	597456.164	1028422.836	193.41
SW-11R	597472.084	1025458.613	192.50
SW-12	597492.038	1028418.745	192.68
SW-13	597575.515	1028404.399	192.95
SW-14	597427.458	1028404.028	192.87
SW-15	597556.963	1028496.220	194.58
SW-16	597424.860	1028497.058	194.57

Notes:

Survey was completed August 27, 2018.
Horizontal Datum: North American Datum of 1983 (91), South Zone, US Feet
Vertical Datum: National Geodetic Vertical Datum of 1958, US Feet

Abbreviations and Acronyms:

ft = foot/feet
ID = identification

APPENDIX A

Selected Site Photographs

1. Looking east at the Site; beginning excavation activities.

2. Looking northeast at the Site; removal of clean overburden.

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Selected Site Photographs**	Figure A-1

3. Looking south at the Site; uncovering 1996 excavation area backfill.

4. Looking west from the Site; direct loading of contaminated soil into awaiting containers.

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Selected Site Photographs**	Figure A-2

5. Looking east at the Site; reaching final depth at Slot E.

6. Looking west at the Site; slots supported using sheet pile walls.

LANDAU ASSOCIATES	Webster Nursery Site Tumwater, Washington	**Selected Site Photographs**

Figure
A-3

7. Looking west at the Site; excavating Slots A through D.

8. Looking east at the Site; groundwater infiltration in Slots A through D.

9. Looking west at the Site; placing CDF in Slots A through D.

10. Looking west at the Site; Site restoration and new monitoring well locations.

APPENDIX B

Well Decommissioning Records

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE50267

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

- ☐ Construction
- ☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number: RE03197

Consulting Firm 3 KINGS

Unique Ecology Well IDTag No. BBL544

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) DAY,TYLER

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2896

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

- ☒ Resource Protection
- ☐ Geotech Soil Boring

Property Owner DEPARTMENT OF NATURAL RESOURCES

Site Address 9805 BLOMBERG ST SW

City TUMWATER County THURSTON Thurston

Location ____ 1/4-1/4 NE 1/4 Sec SE Twn 17N R 2W

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

Tax Parcel No. 12720130000

Cased or Uncased Diameter ____ Static Level ____

Work/Decommission Start Date 7/30/18

Work/Decommission Completed Date 7/30/18

306-18-1129

Construction Design	Well Data	Formation Description
CHIP IN PLACE WELL 2" PVC BENTONITE CHIPS (1 BAG) REMOVED MONUMENT	DEPTH OF WELL 20'	

SCALE: 1"= ____ PAGE 1 OF 1

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE50267

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

- ☐ Construction
- ☒ Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Consulting Firm

Unique Ecology Well IDTag No.

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

☒ Driller ☐ Engineer ☐ Trainee

Name (Print Last, First Name) DAY, TYLER

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2896

If trainee, licensed driller's Signature and License Number:

Type of Well *("x in box)*

- ☒ Resource Protection
- ☐ Geotech Soil Boring

Property Owner DEPARTMENT OF NATURAL RESOURCES

Site Address 9805 BLOMBERG ST SW

City TUMWATER County THURTON Thurston

Location ____ 1/4-1/4 NE 1/4 Sec SE Twn 17N R 2W

EWM ☒ or WWM ☐

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

Tax Parcel No. 12720130000

Cased or Uncased Diameter ____ Static Level ____

Work/Decommission Start Date 7/30/18

Work/Decommission Completed Date 7/30/18

306-18-1129

Construction Design	Well Data	Formation Description
CHIP IN PLACE WELL 2" PVC BENTONITE CHIPS (1 BAG) REMOVED MONUMENT	DEPTH OF WELL 20'	

SCALE: 1"= ____ PAGE 1 OF 1

ECY 050-12 (Rev 02-2011) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

Please print, sign and return to the Department of Ecology

RESOURCE PROTECTION WELL REPORT

CURRENT Notice of Intent No. AE50267

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

Construction/Decommission *("x" in box)*

[ ] Construction

[■] Decommission

ORIGINAL INSTALLATION Notice of Intent Number:

Type of Well *("x in box)*

[■] Resource Protection

[ ] Geotech Soil Boring

Property Owner DEPARTMENT OF NATURAL RESOURCES

Site Address 9805 BLOMBERG ST SW

City TUMWATER County THURTON Thurston

Location ____ 1/4-1/4 NE 1/4 Sec SE Twn 17N R 2W

EWM [■] or WWM [ ]

Lat/Long (s, t, r still REQUIRED) Lat Deg ____ Min ____ Sec ____

Long Deg ____ Min ____ Sec ____

Tax Parcel No. 12720130000

Cased or Uncased Diameter ____ Static Level ____

Work/Decommission Start Date 7/30/18

Work/Decommission Completed Date 7/30/18

Consulting Firm ____

Unique Ecology Well IDTag No. ____

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

[■] Driller [ ] Engineer [ ] Trainee

Name (Print Last, First Name) DAY,TYLER

Driller/Engineer /Trainee Signature

Driller or Trainee License No. 2896

If trainee, licensed driller's Signature and License Number:

306-18-1129

Construction Design	Well Data	Formation Description
CHIP IN PLACE WELL 2" PVC BENTONITE CHIPS (1 BAG) REMOVED MONUMENT	DEPTH OF WELL 20'	

SCALE: 1"= ____ PAGE 1 OF 1

ECY 050-12 (Rev 02-2011) To request ADA accommodation including materials in a format for the visually impaired, call Ecology Water Resources Program at 360-407-6872. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

APPENDIX C

Excavation As-Built Drawings

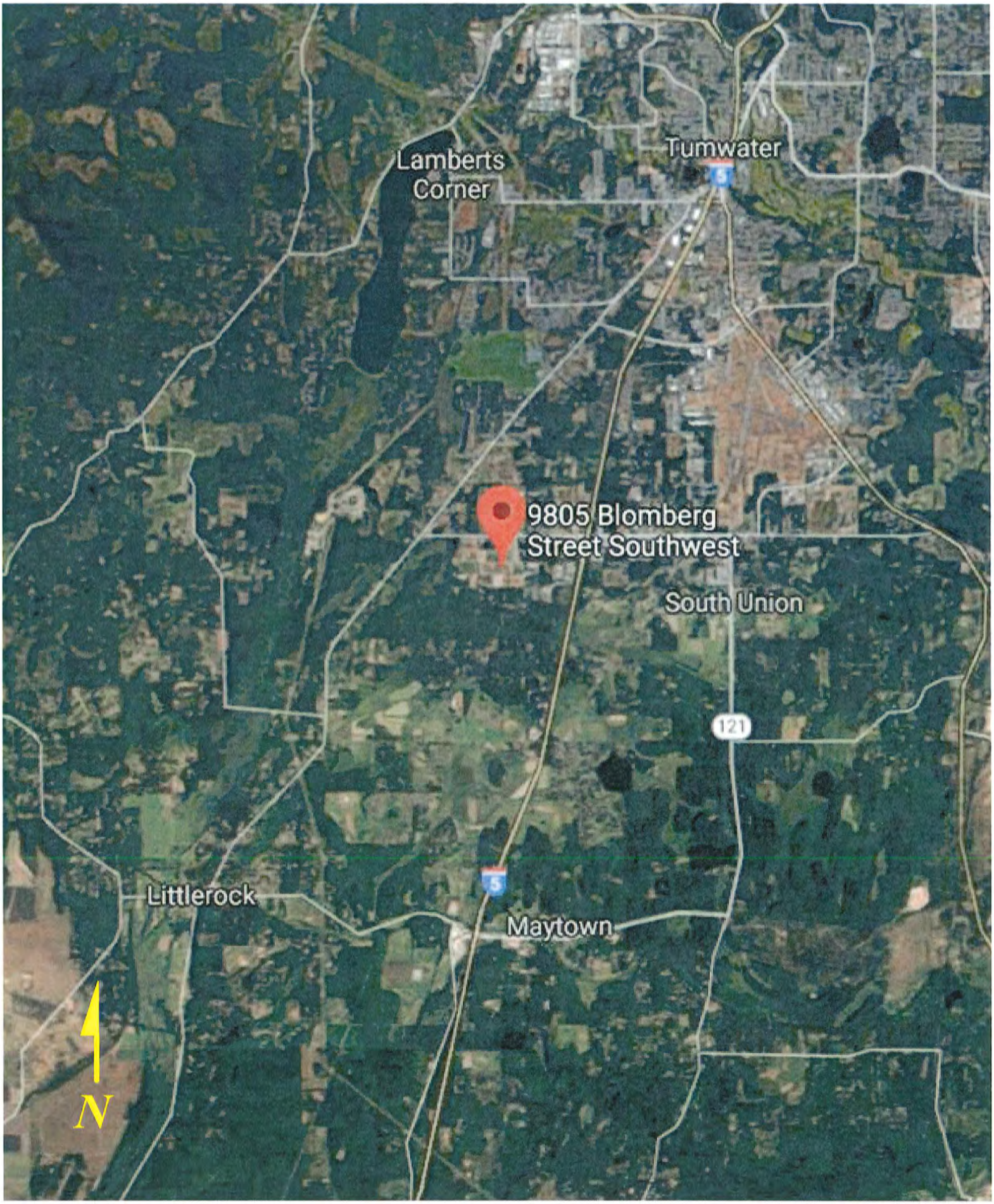


FIGURE 1: SITE VICINITY MAP

DNR-Webster Nursery Cleanup
9805 Blomberg Street SW
Tumwater, Washington
3 Kings Job Number: 218076

3 KINGS
ENVIRONMENTAL • EXCAVATING • DEMO

FIGURE 2: SITE MAP

DNR-Webster Nursery Cleanup
9805 Blomberg Street SW
Tumwater, Washington
3 Kings Job Number: 218076

3 KINGS
ENVIRONMENTAL • EXCAVATING • DEMO

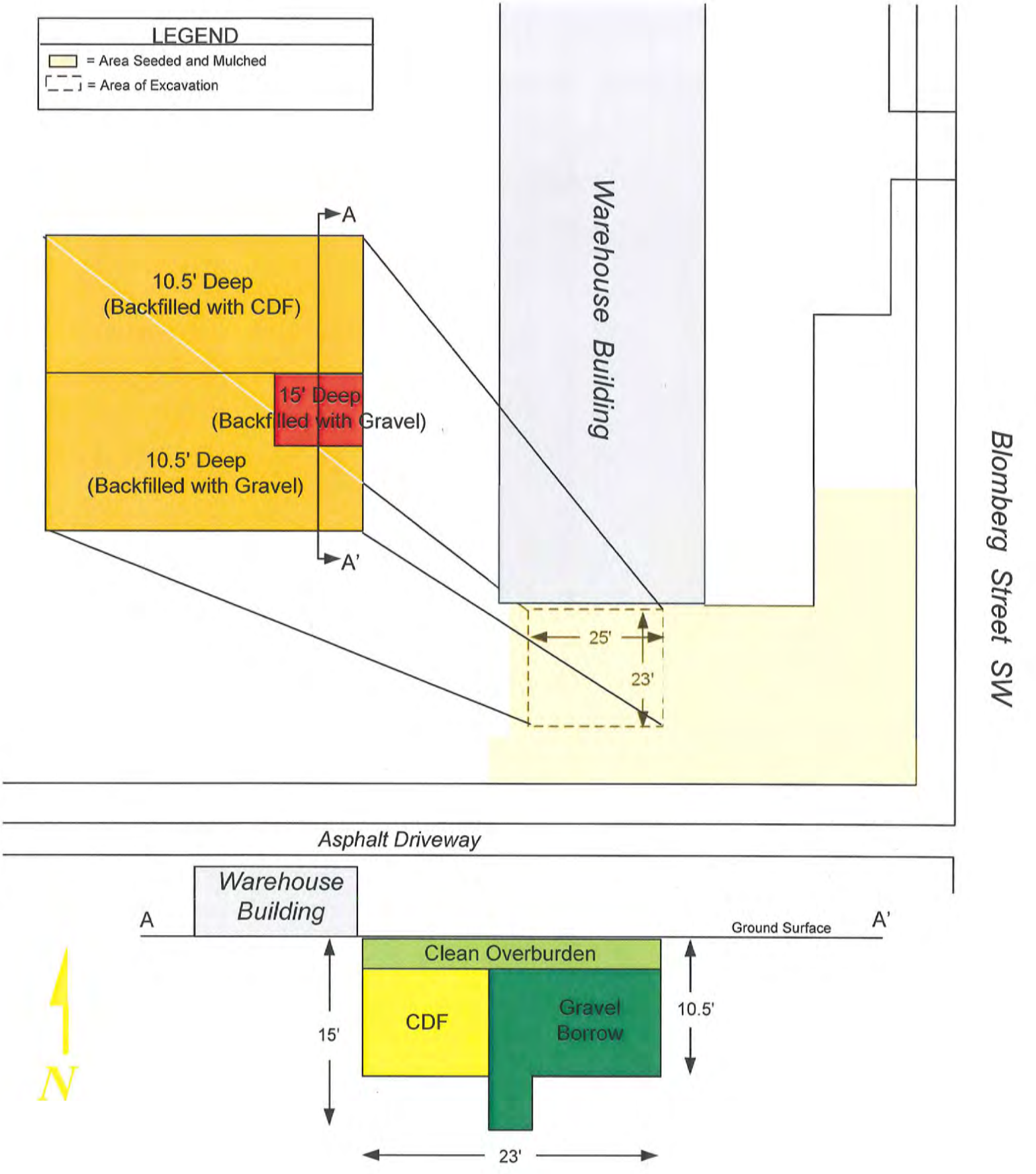


FIGURE 3:
AS-BUILT MAP

DNR-Webster Nursery Cleanup
9805 Blomberg Street SW
Tumwater, Washington
3 Kings Job Number: 218076

3 KINGS
ENVIRONMENTAL • EXCAVATING • DEMO

APPENDIX D

Soil Disposal Documentation

Table D-1
Soil Disposal Documentation Summary
Webstery Nursery – Tumwater, Washington

Date	Vehicle ID	Ticket #	Quantity (estimated cubic yards)	Quantity (actual tons)
8/4/2018	329	3258807	28	32.43
8/4/2018	5222	3258808	28	27.85
8/7/2018	329	3258871	28	31.43
8/7/2018	7328	3258872	28	29.39
8/7/2018	7329	3258873	28	35.47
8/7/2018	6181	3258874	28	36.15
8/13/2018	1454	3259046	28	29.2
8/13/2018	7327	3259047	28	31.88
8/13/2018	330	3259049	28	23.37
		Total Quantity	252	277.17

SITE Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

CUSTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3258807	CELL 262229	
WEIGHMASTER	Denise B.		
DATE/TIME IN	8/4/18 7:32 am	DATE/TIME OUT	8/4/18 8:05 am
VEHICLE	0329	CONTAINER	GCEU432020
REFERENCE			
BILL OF LADING	BNSF231122		

SCALE IN GROSS WEIGHT 111,480 NET TONS 32.42 INBOUND
SCALE OUT TARE WEIGHT 46,640 NET WEIGHT 64,840 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	TD	Tracking QTY				
32.42	tn	Contained in Origin:Tumwater 100% Contaminated Soil				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT
TENDERED
CHANGE
CHECK#

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

SITE Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

CUSTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3258808	CELL 262230	
WEIGHMASTER	Denise B.		
DATE/TIME IN	8/4/18 7:37 am	DATE/TIME OUT	8/4/18 8:08 am
VEHICLE	5222	CONTAINER	TOLU453880
REFERENCE			
BILL OF LADING	BNSF231122		

SCALE IN GROSS WEIGHT 101,740 NET TONS 27.85 INBOUND
SCALE OUT TARE WEIGHT 46,040 NET WEIGHT 55,700 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	YD	Tracking QTY				
27.85	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT

TENDERED

CHANGE

CHECK#

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

ITE Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

USTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3258871	CELL 262240	
WEIGHMASTER	Tiffany O.		
DATE/TIME IN 8/7/18	6:14 am	DATE/TIME OUT 8/7/18	6:50 am
VEHICLE 0329		CONTAINER TOLU457546	
REFERENCE			
BILL OF LADING BNSF231011			

SCALE IN GROSS WEIGHT 111,420 NET TONS 31.43 INBOUND
SCALE OUT TARE WEIGHT 48,560 NET WEIGHT 62,860 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	TO	Tracking QTY				
31.43	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT
TENDERED
CHANGE
CHECK#

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ITE **Centralia, WA --**
CENTRALIA ROOSEVELT-ROOSEVELT, WA

USTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3258872	CELL	262239
WEIGHMASTER	Tiffany O.		
DATE/TIME IN	8/7/18 6:22 am	DATE/TIME OUT	8/7/18 6:54 am
VEHICLE	7328	CONTAINER	GCEU431285
REFERENCE			
BILL OF LADING	BNSF230070		

SCALE IN GROSS WEIGHT 105,900 NET TONS 29.39
SCALE OUT TARE WEIGHT 47,120 NET WEIGHT 58,780

INBOUND
INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	YD	Tracking QTY				
29.39	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT
TENDERED
CHANGE
CHECK#

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TE Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

USTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11 | TICKET # 3258873 | CELL 262231

WEIGHMASTER Tiffany O.

DATE/TIME IN 8/7/18 6:18 am | DATE/TIME OUT 8/7/18 7:02 am

VEHICLE 7329 | CONTAINER TOLU425670

REFERENCE

BILL OF LADING BNSF231011

SCALE IN GROSS WEIGHT 118,660 NET TONS 35.47
SCALE OUT TARE WEIGHT 47,720 NET WEIGHT 70,940

INBOUND
INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	YD	Tracking QTY				
35.47	tn	Contained in Origin:Tumwater 100% Contaminated Soil				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT

TENDERED

CHANGE

CHECK#

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ITE Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

USTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11 | TICKET # 3258874 | CELL 262233

WEIGHMASTER Tiffany O.

DATE/TIME IN 8/7/18 6:25 am | DATE/TIME OUT 8/7/18 7:07 am

VEHICLE 6181 | CONTAINER GCEU445118

REFERENCE

BILL OF LADING BNSF230070

SCALE IN GROSS WEIGHT 118,000 NET TONS 36.15 INBOUND
SCALE OUT TARE WEIGHT 45,700 NET WEIGHT 72,300 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
36.00	TD	Tracking QTY				
36.15	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT

TENDERED

CHANGE

CHECK#

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ITE **Centralia, WA --**
CENTRALIA ROOSEVELT-ROOSEVELT, WA

USTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3259046	CELL 262307	
WEIGHMASTER Tiffany O.			
DATE/TIME IN 8/13/18 7:12 am		DATE/TIME OUT 8/13/18 7:59 am	
VEHICLE 1454		CONTAINER TOLU452466	
REFERENCE			
BILL OF LADING DTTX56050			

SCALE IN GROSS WEIGHT 105,180 NET TONS 29.20 INBOUND
SCALE OUT TARE WEIGHT 46,780 NET WEIGHT 58,400 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	YD	Tracking QTY				
29.20	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT
TENDERED
CHANGE
CHECK#

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ITE
Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

USTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3259047	CELL 262308	
WEIGHMASTER	Tiffany O.		
DATE/TIME IN	8/13/18 7:05 am	DATE/TIME OUT	8/13/18 7:59 am
VEHICLE	7327	CONTAINER	GCEU430038
REFERENCE			
BILL OF LADING	BNSF231011		

SCALE IN GROSS WEIGHT 110,540 NET TONS 31.88 INBOUND
SCALE OUT TARE WEIGHT 46,780 NET WEIGHT 63,760 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	YD	Tracking QTY				
31.88	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT
TENDERED
CHANGE
CHECK#

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SITE Centralia, WA --
CENTRALIA ROOSEVELT-ROOSEVELT, WA

CUSTOMER 012646
3 Kings Environmental
P. O. Box 280
Battle Ground, WA 98604
Contract:TB-12151

SITE 11	TICKET # 3259049	CELL	262234
WEIGHMASTER	Tiffany O.		
DATE/TIME IN	8/13/18 7:21 am	DATE/TIME OUT	8/13/18 8:05 am
VEHICLE	0330	CONTAINER	TOLU425710
REFERENCE			
BILL OF LADING	DTTX56050		

SCALE IN GROSS WEIGHT 94,220 NET TONS 23.37 INBOUND
SCALE OUT TARE WEIGHT 47,480 NET WEIGHT 46,740 INVOICE

QTY.	UNIT	DESCRIPTION	RATE	EXTENSION	TAX	TOTAL
28.00	YD	Tracking QTY				
23.37	tn	Contained in Contaminated Soil Origin:Tumwater 100%				
1.00		CONTAINER/CHASIS RENTAL				

NET AMOUNT
TENDERED
CHANGE
CHECK#

The undersigned individual signing this document on behalf of Customer acknowledges that he or she has read and understands the terms and conditions on the reverse side and that he or she has the authority to sign this document on behalf of the customer.

RS-F042UPR (07/12)

SIGNATURE _____

REPUBLIC SERVICES, INC.

Republic Services, Inc.

18500 N. Allied Way, Phoenix, AZ 85054

SPECIAL WASTE DEPARTMENT DECISION

	Waste Profile # 41781812151	**Expiration Date** 10/31/2018	
I. Decision Request:	☐ **Initial** **Recertification** **Change**		

Disposal Facility: 4178 - Roosevelt Regional MSW L/F

Generator Name: Department of Natural Resources

Generator Site Address: 9805 Blomberg Street SW

City: Tumwater	**County:**	**State:** WA	**Zip:**

Name of Waste: Pesticide Impacted Soil (Contained Out Designation)

Estimated Annual Volume: 145 Cubic Yards

II. Special Waste Department Decision: **Approved** **Rejected**

Management Method(s): ☐ Landfill ☐ Solidification Bioremediation Transfer Facility

Problematic Special Waste according to Republic? Yes No

If yes, which one?

Approved by Special Waste Review Committee? Yes No Not Applicable

Precautions, Conditions or Limitations on Approval

The Generator must meet the conditions listed on the State of Washington Department of Ecology letter "Contained-Out Determination for Contaminated Soils from Webster Nursery in Tumwater, Washington (Ecology Cleanup Site Identification No. 3380)," dated July 18, 2018.

TOTAL VOLUME approved for disposal is 145 CUBIC YARDS.

Department of Ecology approval expiration date: OCTOBER 31, 2018.

Special Waste Analyst Signature: Joseph M. Sorokach **Name (Printed):** Joseph Sorokach

Date: 7/27/2018

III. Facility Decision: ✓ **Approved** **Rejected**

Precautions, Conditions or Limitations on Approval

By signing below, the General Manager or Designee agrees that a fully executed Special Waste Service Agreement is on file for this profile and that the special waste file is complete.

General Manager or Designee: **Name (Printed):**

Date: 7/27/2018

REPUBLIC SERVICES **SPECIAL WASTE PROFILE**

Requested Disposal Facility: 4178 Roosevelt Regional MSW LF WA

Waste Profile #
Sales Rep #:

Saveable fill-in form. Restricted printing until all required (yellow) fields are completed.

I. Generator Information

Generator Name: Department of Natural Resources			
Generator Site Address: 9805 Blomberg Street SW			
City: Tumwater	County: Thurston	State: Washington	Zip: 98512
State ID/Reg No:	State Approval/Waste Code: (if applicable)		NAICS #:
Generator Mailing Address (if different): ☐ 9805 Blomberg Street SW			
City: Tumwater	County:	State: Washington	Zip: 98512
Generator Contact Name: Mr. John Felder		Email: john.felder@dnr.wa.gov	
Phone Number: (360) 902-1158	Ext:	Fax Number:	

II. Billing Information

Bill To: 3 Kings Environmental, Inc.		Contact Name: Brett MacDonald	
Billing Address: PO Box 280		Email: bmacdonald@3kingsinc.com	
City: Battle Ground	State: WA	Zip: 98604	Phone: (360) 666-5464

III. Waste Stream Information

Name of Waste: Pesticide-Impacted Soil	
Process Generating Waste: Leaking tank containing pesticide residue	
Type of Waste:	☐ INDUSTRIAL PROCESS WASTE ☑ POLLUTION CONTROL WASTE
Physical State:	☑ SOLID ☐ SEMI-SOLID ☐ POWDER ☐ LIQUID
Method of Shipment:	☑ BULK ☐ DRUM ☐ BAGGED ☐ OTHER:
Estimated Annual Volume:	300 Tons
Frequency:	☑ ONE TIME ☐ ONGOING
Disposal Consideration:	☑ LANDFILL ☐ SOLIDIFICATION ☐ BIOREMEDIATION

IV. Representative Sample Certification

☐ NO SAMPLE TAKEN

Is the representative sample collected to prepare this profile and laboratory analysis, collected in accordance with U.S. EPA 40 CFR 261.20(c) guidelines or equivalent rules?	☑ YES or ☐ NO
Type of Sample: ☐ COMPOSITE SAMPLE ☑ GRAB SAMPLE	
Sample Date: 09/01/2017	
See Attached Report	

REPUBLIC SERVICES **SPECIAL WASTE PROFILE**

Waste Profile #

V. Physical Characteristics of Waste

Characteristic Components	% by Weight (range)
1. Pesticide-Impacted Soil	98-100
2. Drums containing Investigation Derived Waste	0-2
3.	
4.	
5.	

Color	Odor (describe)	Does Waste Contain Free Liquids?	% Solids	pH:	Flash Point
Brown	Pesticide (Mild)	☐ YES or ☑ NO	100	6 to 9	N/A °F

Attach Laboratory Analytical Report (and/or Material Safety Data Sheet) Including Chain of Custody and Required Parameters Provided for this Profile

Does this waste or generating process contain regulated concentrations of the following Pesticides and/or Herbicides: Chlordane, Endrin, Heptachlor (and its epoxides), Lindane, Methoxychlor, Toxaphene, 2,4-D, or 2,4,5-TP Silvex as defined in 40 CFR 261.33?	☑ Yes or ☐ No
Does this waste contain reactive sulfides (greater than 500 ppm) or reactive cyanide (greater than 250 ppm)[reference 40 CFR 261.23(a)(5)]?	☐ Yes or ☑ No
Does this waste contain regulated concentrations of Polychlorinated Biphenyls (PCBs) as defined in 40 CFR Part 761?	☐ Yes or ☑ No
Does this waste contain concentrations of listed hazardous wastes defined in 40 CFR 261.31, 261.32, 261.33, including RCRA F-Listed Solvents?	☐ Yes or ☑ No
Does this waste exhibit a Hazardous Characteristic as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Does this waste contain regulated concentrations of 2,3,7,8-Tetrachlorodibenzodioxin (2,3,7,8-TCCD), or any other dioxin as defined in 40 CFR 261.31?	☐ Yes or ☑ No
Is this a regulated Radioactive Waste as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Is this a regulated Medical or Infectious Waste as defined by Federal and/or State regulations?	☐ Yes or ☑ No
Is this waste a reactive or heat generating waste?	☐ Yes or ☑ No
Does the waste contain sulfur or sulfur by-products?	☐ Yes or ☑ No
Is this waste generated at a Federal Superfund Clean Up Site?	☐ Yes or ☑ No
Is this waste from a TSD facility, TSD like facility or consolidator?	☐ Yes or ☑ No

VI. Certification

I hereby certify that to the best of my knowledge and belief, the information contained herein is a true, complete and accurate description of the waste material being offered for disposal and all known or suspected hazards have been disclosed. All Analytical Results/Material Safety Data Sheets submitted are truthful and complete and are representative of the waste.

I further certify that by utilizing this profile, neither myself nor any other employee of the company will deliver for disposal or attempt to deliver for disposal any waste which is classified as toxic waste, hazardous waste or infectious waste, or any other waste material this facility is prohibited from accepting by law. I shall immediately give written notice of any change or condition pertaining to the waste not provided herein. Our company hereby agrees to fully indemnify this disposal facility against any damages resulting from this certification being inaccurate or untrue.

I further certify that the company has not altered the form or content of this profile sheet as provided by Republic Services Inc.

Brett MacDonald	3 Kings Environmental, Inc.
Authorized Representative Name And Title (Type or Print)	Company Name
Brett MacDonald	07/23/2018
Authorized Representative Signature	Date

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

July 18, 2018

Mr. John Felder
Department of Natural Resources
P.O. Box 47030
Olympia, WA 98504-7030

Re: Contained-Out Determination for Contaminated Soils from Webster Nursery in Tumwater, Washington (Ecology Cleanup Site Identification No. 3380)

Reference: Email from Sierra Mott, Landau Associates, Inc., to Charles Hoffman, dated July 11, 2018

Email from Toni Smith, Landau Associates, Inc., to Charles Hoffman, dated January 17, 2017

Report from Eric Weber, Landau Associates, Inc., to Ava Edmonson, dated April 22, 2016

Email from Toni Smith, Landau Associates, Inc., to Charles Hoffman, dated October 11, 2016

Dear Mr. Felder:

The Washington State Department of Ecology (Ecology) received a request from your consultant, Landau Associates, Inc., for a contained-out determination for approximately 145 cubic yards of soil to be excavated at the Webster Nursery located in Tumwater, Washington. Landau Associates, Inc., submitted analytical data and supplemental information to determine if the soils are contaminated with listed dangerous waste constituents (identified in the report as D020 and D031) are exempt from management as dangerous wastes according to the "Contained-In Policy"[1].

Based on review of the provided information, Ecology's determination follows:

Ecology understands that approximately 145 cubic yards of U036 and P059 listed waste contaminated soils subject to the contained-out request do not designate under federal characteristics (WAC 173-303-090) or state-only criteria (WAC 173-303-100). Ecology will not require disposal of these soils as listed dangerous wastes at a RCRA permitted dangerous waste treatment, storage, and disposal (TSD) facility, provided that all of the following conditions are implemented.

[1]Washington State Department of Ecology Contained-In Policy, February 19, 1993

You or your consultant, Landau Associates, Inc., shall:

- Ensure that no standing water is present within each container holding the contaminated soils. All water must be removed to the maximum extent possible from each container and managed as U036 and P059 dangerous waste or as otherwise allowed under Chapter 173-303 WAC;
- Directly deliver the soils to a solid waste landfill permitted under WAC 173-351 in the state of Washington. If you plan to deliver the contaminated soils to a landfill outside Washington State, you must submit to Ecology written approval for the contaminated soil disposal from the receiving State hazardous waste program and the out-of-state landfill, before the soils are delivered to the out-of-state landfill. Do not consolidate these contaminated soils with other solids that do not pertain to this contained-out determination. No off-loading of the contaminated soils is allowed between the cleanup site and the permitted solid waste landfill;
- Dispose of the contaminated soils at a permitted solid waste landfill by October 31, 2018, or within 90 days of excavation, whichever comes first. This contained-out determination letter is no longer valid after October 31, 2018, and the contaminated soils must be managed as dangerous wastes after this date;
- Notify Ecology before disposal of the soil if the amount exceeds the amount approved by this letter. Ecology needs assurance that additional soil qualifies for this contained-out determination;
- Provide copies of all signed solid waste landfill receipts or a certificate of disposal issued by the receiving landfill for these contaminated soils to Ecology, attention of Charles Hoffman, within 15 days or your receipt. This is an important verification step for you and your consultation for this Ecology decision to be valid;
- Take measures to prevent unauthorized contact with the soils at all times;
- Plastic line the delivery truck (or roll of boxes) and cover all loads if delivered by truck;
- During transport, take adequate measure to prevent spill and dispersion due to wind erosion;
- Provide instructions to the landfill operator that these soils are not to be used for daily, intermediate, or final cover;
- Provide copies of all soil analytical data to the landfill operator upon request, and
- Do not send these contaminated soils to any incinerator, thermal desorption unit, or recycling facility unless that facility is a RCRA subtitle C permitted dangerous waste TSD facility.

Ecology issued this determination based on the information provided and reviewed to date. This written decision only applies to the approximately 145 cubic yards of soil described in the

April 22, 2016, report by Landau Associates Inc. and the January 17, 2017, email message from Landau Associates Inc., and does not apply to any other area or other media. Any data used for this contained-out determination is intended for use in determining the proper disposal of the soils according to the Washington State Dangerous Waste Regulation, Chapter 132-303 WAC, and Ecology's Contained-in Policy.

This letter is not an Ecology approval for dangerous waste designation process or disposal of soils that may be generated in the future or already excavated.

This letter is not a No Further Action (NFA) letter and not a written approval for any cleanup action plan. Instead, this letter only address the procedures for disposal of contaminated soils according to the Washington State Dangerous Waste Regulation (Chapter 173-303 WAC). Regulatory decisions regarding the cleanup action, applicable soil and groundwater cleanup level, and any other cleanup issues must comply with the requirements under Model Toxics Control Act (Chapter 173-340 WAC).

Local agencies may have the authority to impose additional requirements on this waste stream.

If you fail to comply with the terms of this letter, Ecology may issue an administrative order and/or penalty as provided by the Revised Code of Washington, Sections 70.105.080 and/or .095 (Hazardous Waste Management Act).

Please contact me at (360) 407-6344 or chof461@ecy.wa.gov if I can answer any questions or provided additional information.

Sincerely,

Charles P. Hoffman

Charles P. Hoffman, P.E.
Environmental Engineer
Hazardous Waste and Toxics Reduction Program
Southwest Regional Office

cc: Sierra Mott, Landau Associates, Inc.
Gerald Tousley, Thurston County Health Department
Steve Teel, Ecology/SWRO

APPENDIX E

Laboratory Analytical Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79252-1
Client Project/Site: 2018 Webster Nursery Cleanup

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Sierra Mott

Authorized for release by:
8/7/2018 6:08:42 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Job ID: 580-79252-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79252-1

Comments
No additional comments.

Receipt
The sample was received on 8/1/2018 1:34 PM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 9.4º C.

GC Semi VOA
Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-280818 recovered outside acceptance criteria, low biased, for Endrin aldehyde, Heptachlor epoxide, Endosulfan sulfate, Dieldrin, alpha-BHC, Endosulfan I and 4,4'-DDE. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method(s) 8081B: Q flags were removed manually for Endrin and Endosulfan I due to CCVIS passing criteria, 20.1% and -20.3% rounds to 20%. (CCVIS 580-280818/8)

Method(s) 8081B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries and precision for preparation batch 580-280649 and analytical batch 580-280818 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample / laboratory sample control duplicate (LCS/LCSD) precision was within acceptance limits.

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-280818 recovered low and outside the control limits for Heptachlor epoxide on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: EX-SP-1-comp (580-79252-1), (CCVIS 580-280818/8), (580-79252-1 MS) and (580-79252-1 MSD).

Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-280818 recovered above the upper control limit for Technical Chlordane. The samples associated with this CCV were re-analyzed in batch 281015 for the Technical Chlordane dilutions. The following samples are impacted: EX-SP-1-comp (580-79252-1), (CCV 580-280818/5), (580-79252-1 MS) and (580-79252-1 MSD).

Method(s) 8081B: PEM breakdown fails on the confirmation column only. Since these samples are being reported from the passing, primary column, re-analysis was not performed. X-SP-1-comp (580-79252-1), (CCV 580-281015/5), (PEM 580-281015/4), (580-79252-1 MS) and (580-79252-1 MSD)

Method(s) 8081B: The following samples were diluted due to the nature of the sample matrix: (580-79252-1 MS) and (580-79252-1 MSD). Because of this dilution, the surrogate spike and matrix spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method(s) 8081B: The following samples were diluted to bring the concentration of target analytes within the calibration range: EX-SP-1-comp (580-79252-1), (580-79252-1 MS) and (580-79252-1 MSD). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79252-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79252-1	EX-SP-1-comp	Solid	08/01/18 08:42	08/01/18 13:34

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client	Client Contact	Date	Chain of Custody Number
Landau Associates, Inc.	Sierra Mott smott@landauinc.com	8/1/18	36902
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page 1 of 1**
2107 S C St	(253) 225-5743	79252	
City / **State** / **Zip Code**	**Sampler**	**Lab Contact**	
Tacoma / WA / 98402	Annabel Warnell	Sheri Cruz	
Project Name and Location (State)	**Billing Contact**		
2018 Webster Nursery Cleanup, WA	Sierra Mott		
Contract/Purchase Order/Quote No.			
0774006.040.044			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis (Attach list if more space is needed): Pesticides EPA 8081B	Special Instructions/ Conditions of Receipt
EX-SP-1-comp	8/1/18	8:42				X	X						X	On ice

580-79252 Chain of Custody

Therm. ID: A2 Cor: 3.4 ° Unc: 1.3 °
Cooler Dsc: Med Red
Packing: bub
Cust. Seal: Yes ____ No X
(Wet/Packs/Dry Ice/None)
FedEx: ____
UPS: ____
Lab Cour: ____
Other: cli ice

Cooler: ☑ Yes ☐ No Cooler Temp: ____

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☑ Other 72 hours

QC Requirements (Specify):

	Sign/Print	Date	Time
1. Relinquished By	Annabel Warnell	8/1/18	13:34
1. Received By	Tom Blankinship	8/1/18	1334
2. Relinquished By			
2. Received By			
3. Relinquished By			
3. Received By			

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

8/7/2018

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-79252-1

Login Number: 79252
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8081B - Organochlorine Pesticides (GC)

Client Sample ID: EX-SP-1-comp
Date Collected: 08/01/18 08:42
Date Received: 08/01/18 13:34

Lab Sample ID: 580-79252-1
Matrix: Solid
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
4,4'-DDE	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
4,4'-DDT	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Aldrin	ND		3.2		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
alpha-BHC	ND	F1	2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
beta-BHC	ND		5.4		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
cis-Chlordane	**14**	**F1**	2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
delta-BHC	ND		3.2		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Dieldrin	ND	F1	2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Endosulfan I	ND	F1	2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Endosulfan II	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Endosulfan sulfate	ND	F1	2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Endrin	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Endrin aldehyde	ND		21		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Endrin ketone	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
gamma-BHC (Lindane)	ND		2.1		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Heptachlor	**13**		3.2		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Heptachlor epoxide	**58**	**F1**	3.2		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Methoxychlor	ND	F2	11		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
Toxaphene	ND		110		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1
trans-Chlordane	**43**	**F1**	3.2		ug/Kg	☼	08/02/18 09:29	08/04/18 01:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*97*		*43 - 129*	*08/02/18 09:29*	*08/04/18 01:03*	*1*
Tetrachloro-m-xylene	*87*		*50 - 123*	*08/02/18 09:29*	*08/04/18 01:03*	*1*

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79252-1

Method: 8081B - Organochlorine Pesticides (GC) - DL

Client Sample ID: EX-SP-1-comp
Date Collected: 08/01/18 08:42
Date Received: 08/01/18 13:34

Lab Sample ID: 580-79252-1
Matrix: Solid
Percent Solids: 90.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technical Chlordane	200		110		ug/Kg	☼	08/02/18 09:29	08/07/18 13:51	10

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 580-280649/1-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 280649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
4,4'-DDE	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
4,4'-DDT	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Aldrin	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
alpha-BHC	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
beta-BHC	ND		5.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
cis-Chlordane	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
delta-BHC	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Dieldrin	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endosulfan I	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endosulfan II	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endosulfan sulfate	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endrin	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endrin aldehyde	ND		20		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endrin ketone	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
gamma-BHC (Lindane)	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Heptachlor	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Heptachlor epoxide	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Methoxychlor	ND		10		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Toxaphene	ND		100		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
trans-Chlordane	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Technical Chlordane	ND		10		ug/Kg		08/02/18 09:29	08/03/18 23:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*99*		*43 - 129*	*08/02/18 09:29*	*08/03/18 23:27*	*1*
Tetrachloro-m-xylene	*93*		*50 - 123*	*08/02/18 09:29*	*08/03/18 23:27*	*1*

Lab Sample ID: LCS 580-280649/2-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	20.0	18.1		ug/Kg		90	61 - 122
4,4'-DDE	20.0	16.6		ug/Kg		83	53 - 124
4,4'-DDT	20.0	19.7		ug/Kg		99	57 - 137
Aldrin	20.0	16.1		ug/Kg		80	56 - 121
alpha-BHC	20.0	14.7		ug/Kg		74	62 - 120
beta-BHC	20.0	14.9		ug/Kg		74	62 - 120
cis-Chlordane	20.0	17.1		ug/Kg		85	62 - 120
delta-BHC	20.0	16.7		ug/Kg		83	53 - 124
Dieldrin	20.0	16.1		ug/Kg		81	63 - 121
Endosulfan I	20.0	16.2		ug/Kg		81	64 - 121
Endosulfan II	20.0	15.6		ug/Kg		78	37 - 139
Endosulfan sulfate	20.0	14.7		ug/Kg		73	63 - 120
Endrin	20.0	21.8		ug/Kg		109	70 - 127
Endrin aldehyde	20.0	13.9	J	ug/Kg		70	36 - 150
Endrin ketone	20.0	16.5		ug/Kg		83	56 - 120
gamma-BHC (Lindane)	20.0	14.6		ug/Kg		73	55 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 580-280649/2-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Heptachlor	20.0	19.4		ug/Kg		97	64 - 124
Heptachlor epoxide	20.0	15.7		ug/Kg		78	62 - 120
Methoxychlor	20.0	19.8		ug/Kg		99	61 - 130
trans-Chlordane	20.0	16.5		ug/Kg		83	60 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*94*		*43 - 129*
Tetrachloro-m-xylene	*89*		*50 - 123*

Lab Sample ID: LCS 580-280649/4-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Toxaphene	500	416		ug/Kg		83	57 - 126

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*83*		*43 - 129*
Tetrachloro-m-xylene	*83*		*50 - 123*

Lab Sample ID: LCSD 580-280649/3-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	20.0	17.6		ug/Kg		88	61 - 122	3	18
4,4'-DDE	20.0	16.1		ug/Kg		80	53 - 124	3	18
4,4'-DDT	20.0	19.4		ug/Kg		97	57 - 137	1	23
Aldrin	20.0	15.6		ug/Kg		78	56 - 121	3	18
alpha-BHC	20.0	14.0		ug/Kg		70	62 - 120	5	15
beta-BHC	20.0	14.6		ug/Kg		73	62 - 120	2	19
cis-Chlordane	20.0	16.4		ug/Kg		82	62 - 120	4	18
delta-BHC	20.0	16.6		ug/Kg		83	53 - 124	1	18
Dieldrin	20.0	15.7		ug/Kg		78	63 - 121	3	19
Endosulfan I	20.0	15.5		ug/Kg		77	64 - 121	4	20
Endosulfan II	20.0	15.2		ug/Kg		76	37 - 139	3	18
Endosulfan sulfate	20.0	14.3		ug/Kg		71	63 - 120	3	19
Endrin	20.0	20.9		ug/Kg		104	70 - 127	4	20
Endrin aldehyde	20.0	13.6	J	ug/Kg		68	36 - 150	2	24
Endrin ketone	20.0	16.1		ug/Kg		80	56 - 120	3	18
gamma-BHC (Lindane)	20.0	14.4		ug/Kg		72	55 - 120	2	18
Heptachlor	20.0	18.7		ug/Kg		94	64 - 124	4	17
Heptachlor epoxide	20.0	15.1		ug/Kg		75	62 - 120	4	20
Methoxychlor	20.0	19.7		ug/Kg		98	61 - 130	0	20
trans-Chlordane	20.0	15.8		ug/Kg		79	60 - 120	4	19

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 580-280649/3-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280649

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl	90		43 - 129
Tetrachloro-m-xylene	84		50 - 123

Lab Sample ID: LCSD 580-280649/5-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280649

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toxaphene			500	472		ug/Kg		94	57 - 126	13	24

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl	89		43 - 129
Tetrachloro-m-xylene	85		50 - 123

Lab Sample ID: 580-79252-1 MS
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: EX-SP-1-comp
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	ND		21.2	15.1		ug/Kg	☼	71	61 - 122
4,4'-DDE	ND		21.2	14.6		ug/Kg	☼	69	53 - 124
4,4'-DDT	ND		21.2	15.6		ug/Kg	☼	74	57 - 137
Aldrin	ND		21.2	15.1		ug/Kg	☼	71	56 - 121
alpha-BHC	ND	F1	21.2	14.4		ug/Kg	☼	62	62 - 120
beta-BHC	ND		21.2	15.1		ug/Kg	☼	71	62 - 120
cis-Chlordane	14	F1	21.2	26.4	F1	ug/Kg	☼	58	62 - 120
delta-BHC	ND		21.2	15.1		ug/Kg	☼	71	53 - 124
Dieldrin	ND	F1	21.2	12.3	F1	ug/Kg	☼	58	63 - 121
Endosulfan I	ND	F1	21.2	13.8		ug/Kg	☼	65	64 - 121
Endosulfan II	ND		21.2	13.0		ug/Kg	☼	61	37 - 139
Endosulfan sulfate	ND	F1	21.2	12.3	F1	ug/Kg	☼	58	63 - 120
Endrin	ND		21.2	18.4		ug/Kg	☼	84	70 - 127
Endrin aldehyde	ND		21.2	ND		ug/Kg	☼	53	36 - 150
Endrin ketone	ND		21.2	14.3		ug/Kg	☼	67	56 - 120
gamma-BHC (Lindane)	ND		21.2	14.8		ug/Kg	☼	64	55 - 120
Heptachlor	13		21.2	28.0		ug/Kg	☼	68	64 - 124
Heptachlor epoxide	58	F1	21.2	59.1	F1	ug/Kg	☼	3	62 - 120
Methoxychlor	ND	F2	21.2	17.9		ug/Kg	☼	84	61 - 130
trans-Chlordane	43	F1	21.2	51.9	F1	ug/Kg	☼	43	60 - 120

Surrogate	MS %Recovery	MS Qualifier	Limits
DCB Decachlorobiphenyl	86		43 - 129
Tetrachloro-m-xylene	85		50 - 123

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 580-79252-1 MSD
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: EX-SP-1-comp
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	ND		21.5	13.1		ug/Kg	☼	61	61 - 122	14	18
4,4'-DDE	ND		21.5	13.6		ug/Kg	☼	63	53 - 124	7	18
4,4'-DDT	ND		21.5	13.9		ug/Kg	☼	65	57 - 137	12	23
Aldrin	ND		21.5	13.6		ug/Kg	☼	64	56 - 121	10	18
alpha-BHC	ND	F1	21.5	14.2	F1	ug/Kg	☼	60	62 - 120	2	15
beta-BHC	ND		21.5	14.5		ug/Kg	☼	68	62 - 120	4	19
cis-Chlordane	14	F1	21.5	26.5	F1	ug/Kg	☼	58	62 - 120	0	18
delta-BHC	ND		21.5	15.2		ug/Kg	☼	71	53 - 124	0	18
Dieldrin	ND	F1	21.5	13.4	F1	ug/Kg	☼	62	63 - 121	8	19
Endosulfan I	ND	F1	21.5	13.6	F1	ug/Kg	☼	63	64 - 121	2	20
Endosulfan II	ND		21.5	11.9		ug/Kg	☼	56	37 - 139	9	18
Endosulfan sulfate	ND	F1	21.5	11.6	F1	ug/Kg	☼	54	63 - 120	6	19
Endrin	ND		21.5	18.2		ug/Kg	☼	82	70 - 127	1	20
Endrin aldehyde	ND		21.5	ND		ug/Kg	☼	45	36 - 150	15	24
Endrin ketone	ND		21.5	13.0		ug/Kg	☼	61	56 - 120	9	18
gamma-BHC (Lindane)	ND		21.5	14.3		ug/Kg	☼	60	55 - 120	4	18
Heptachlor	13		21.5	27.3		ug/Kg	☼	64	64 - 124	3	17
Heptachlor epoxide	58	F1	21.5	55.6	F1	ug/Kg	☼	-13	62 - 120	6	20
Methoxychlor	ND	F2	21.5	25.6	F2	ug/Kg	☼	119	61 - 130	36	20
trans-Chlordane	43	F1	21.5	59.5		ug/Kg	☼	78	60 - 120	14	19

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*77*		*43 - 129*
Tetrachloro-m-xylene	*79*		*50 - 123*

Method: 8081B - Organochlorine Pesticides (GC) - DL

Lab Sample ID: 580-79252-1 MS
Matrix: Solid
Analysis Batch: 281015

Client Sample ID: EX-SP-1-comp
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD - DL	ND	F1	21.2	ND		ug/Kg	☼	98	61 - 122
4,4'-DDE - DL	ND		21.2	ND		ug/Kg	☼	83	53 - 124
4,4'-DDT - DL	ND	F1	21.2	ND	F1	ug/Kg	☼	28	57 - 137
Aldrin - DL	ND		21.2	ND		ug/Kg	☼	87	56 - 121
alpha-BHC - DL	ND		21.2	ND		ug/Kg	☼	76	62 - 120
beta-BHC - DL	ND		21.2	ND		ug/Kg	☼	90	62 - 120
cis-Chlordane - DL	ND		21.2	21.6	F1	ug/Kg	☼	43	62 - 120
delta-BHC - DL	ND		21.2	ND		ug/Kg	☼	79	53 - 124
Dieldrin - DL	ND		21.2	ND		ug/Kg	☼	81	63 - 121
Endosulfan I - DL	ND		21.2	ND		ug/Kg	☼	82	64 - 121
Endosulfan II - DL	ND		21.2	ND		ug/Kg	☼	78	37 - 139
Endosulfan sulfate - DL	ND		21.2	ND		ug/Kg	☼	74	63 - 120
Endrin - DL	ND	F1 *	21.2	ND		ug/Kg	☼	95	70 - 127
Endrin aldehyde - DL	ND		21.2	ND		ug/Kg	☼	NC	36 - 150
Endrin ketone - DL	ND		21.2	ND		ug/Kg	☼	58	56 - 120

Method: 8081B - Organochlorine Pesticides (GC) - DL (Continued)

Lab Sample ID: 580-79252-1 MS
Matrix: Solid
Analysis Batch: 281015

Client Sample ID: EX-SP-1-comp
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
gamma-BHC (Lindane) - DL	ND		21.2	ND		ug/Kg	☼	76	55 - 120
Heptachlor - DL	ND		21.2	ND		ug/Kg	☼	79	64 - 124
Heptachlor epoxide - DL	77	F1	21.2	73.2	F1	ug/Kg	☼	-18	62 - 120
Methoxychlor - DL	ND	F1	21.2	ND	F1	ug/Kg	☼	49	61 - 130
trans-Chlordane - DL	61	F1	21.2	64.3	F1	ug/Kg	☼	14	60 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl - DL	*96*		*43 - 129*
Tetrachloro-m-xylene - DL	*88*		*50 - 123*

Lab Sample ID: 580-79252-1 MSD
Matrix: Solid
Analysis Batch: 281015

Client Sample ID: EX-SP-1-comp
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD - DL	ND	F1	21.5	ND	F1	ug/Kg	☼	0	61 - 122	NC	18
4,4'-DDE - DL	ND		21.5	ND		ug/Kg	☼	74	53 - 124	11	18
4,4'-DDT - DL	ND	F1	21.5	ND	F1 F2	ug/Kg	☼	22	57 - 137	25	23
Aldrin - DL	ND		21.5	ND		ug/Kg	☼	75	56 - 121	14	18
alpha-BHC - DL	ND		21.5	ND		ug/Kg	☼	65	62 - 120	14	15
beta-BHC - DL	ND		21.5	ND		ug/Kg	☼	74	62 - 120	18	19
cis-Chlordane - DL	ND		21.5	ND	F1	ug/Kg	☼	39	62 - 120	4	18
delta-BHC - DL	ND		21.5	ND		ug/Kg	☼	71	53 - 124	8	18
Dieldrin - DL	ND		21.5	ND		ug/Kg	☼	75	63 - 121	7	19
Endosulfan I - DL	ND		21.5	ND		ug/Kg	☼	73	64 - 121	10	20
Endosulfan II - DL	ND		21.5	ND		ug/Kg	☼	69	37 - 139	11	18
Endosulfan sulfate - DL	ND		21.5	ND		ug/Kg	☼	67	63 - 120	9	19
Endrin - DL	ND	F1 *	21.5	ND		ug/Kg	☼	92	70 - 127	2	20
Endrin aldehyde - DL	ND		21.5	ND		ug/Kg	☼	NC	36 - 150	NC	24
Endrin ketone - DL	ND		21.5	ND	F1 F2	ug/Kg	☼	45	56 - 120	24	18
gamma-BHC (Lindane) - DL	ND		21.5	ND		ug/Kg	☼	68	55 - 120	11	18
Heptachlor - DL	ND		21.5	ND	F1	ug/Kg	☼	62	64 - 124	12	17
Heptachlor epoxide - DL	77	F1	21.5	66.9	F1	ug/Kg	☼	-47	62 - 120	9	20
Methoxychlor - DL	ND	F1	21.5	ND	F2	ug/Kg	☼	94	61 - 130	65	20
trans-Chlordane - DL	61	F1	21.5	72.0	F1	ug/Kg	☼	50	60 - 120	11	19

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl - DL	*88*		*43 - 129*
Tetrachloro-m-xylene - DL	*76*		*50 - 123*

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79252-1

Client Sample ID: EX-SP-1-comp
Date Collected: 08/01/18 08:42
Date Received: 08/01/18 13:34

Lab Sample ID: 580-79252-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280647	08/02/18 09:11	BAH	TAL SEA

Client Sample ID: EX-SP-1-comp
Date Collected: 08/01/18 08:42
Date Received: 08/01/18 13:34

Lab Sample ID: 580-79252-1
Matrix: Solid
Percent Solids: 90.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280649	08/02/18 09:29	SPS	TAL SEA
Total/NA	Analysis	8081B		1	280818	08/04/18 01:03	TL1	TAL SEA
Total/NA	Prep	3546	DL		280649	08/02/18 09:29	SPS	TAL SEA
Total/NA	Analysis	8081B	DL	10	281015	08/07/18 13:51	APR	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79252-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79271-1
Client Project/Site: 2018 Webster Nursery Cleanup

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Sierra Mott

Authorized for release by:
8/6/2018 4:44:19 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Job ID: 580-79271-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79271-1

Comments
No additional comments.

Receipt
The samples were received on 8/2/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º C.

GC Semi VOA
Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-280818 recovered outside acceptance criteria, low biased, for Endrin aldehyde, Heptachlor epoxide, Endosulfan sulfate, Dieldrin, alpha-BHC, Endosulfan I and 4,4'-DDE. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method(s) 8081B: Q flags were removed manually for Endrin and Endosulfan I due to CCVIS passing criteria, 20.1% and -20.3% rounds to 20%. (CCVIS 580-280818/8)

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-280818 recovered low and outside the control limits for Heptachlor epoxide on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: (CCVIS 580-280818/8), (580-79271-1) and (580-79271-2).

Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-280818 recovered above the upper control limit for Technical Chlordane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: (CCV 580-280818/5), (580-79271-1) and (580-79271-2).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79271-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79271-1	IM-SP-1-comp	Solid	07/31/18 11:32	08/02/18 09:30
580-79271-2	IM-SP-2-comp	Solid	07/31/18 11:45	08/02/18 09:30

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client	Client Contact	Date	Chain of Custody Number
Landau Associates, Inc.	Sierra Mott smott@landauinc.com	7/31/18	36901
Address	**Telephone Number (Area Code)/Fax Number**	**Lab Number**	**Page** 1 of 1
2107 S C St	(253) 225-5743		
City Tacoma	**State** WA	**Zip Code** 98402	**Sampler** Annabel Warnell
Lab Contact Sheri Cruz			
Project Name and Location (State) 2018 Webster Nursery Cleanup Tumwater, WA	**Billing Contact** Sierra Mott		
Contract/Purchase Order/Quote No. 0774006.040.044			

Analysis (Attach list if more space is needed)

Loc: 580
79271

Special Instructions/ Conditions of Receipt

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Pesticides EPA 8081B	
IM-SP-1-comp	7/31/18	11:32				X	X						X	On-ice
IM-SP-2-comp	7/31/18	11:45				X	X						X	

580-79271 Chain of Custody

Therm. ID: A2 Cor: 1.3 Unc: 1.2
Cooler Dsc: Med Blk
Packing: Bubble
Cust. Seal: Yes X No
(Wet) Packs/Dry Ice/None
FedEx: P.O.
UPS:
Lab Cour:
Other:

Cooler: ☑ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days)
☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☑ Other 72 hours

QC Requirements (Specify)

	Sign/Print	Date	Time
1. Relinquished By	Annabel Warnell	7/31/18	13:04
1. Received By	TANAS	8-1-18	@ 1045
2. Relinquished By	TANAS	8.1.18	1045
2. Received By	B. Gall SEA TA	8/2/18	0930
3. Relinquished By			
3. Received By			

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (8210) 8/6/2018

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-79271-1

Login Number: 79271
List Number: 1
Creator: Hobbs, Kenneth F

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8081B - Organochlorine Pesticides (GC)

Client Sample ID: IM-SP-1-comp
Date Collected: 07/31/18 11:32
Date Received: 08/02/18 09:30

Lab Sample ID: 580-79271-1
Matrix: Solid
Percent Solids: 88.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
4,4'-DDE	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
4,4'-DDT	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Aldrin	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
alpha-BHC	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
beta-BHC	ND		5.3		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
cis-Chlordane	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
delta-BHC	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Dieldrin	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Endosulfan I	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Endosulfan II	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Endosulfan sulfate	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Endrin	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Endrin aldehyde	ND		21		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Endrin ketone	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
gamma-BHC (Lindane)	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Heptachlor	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Heptachlor epoxide	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Methoxychlor	ND		11		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Toxaphene	ND		110		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
trans-Chlordane	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1
Technical Chlordane	ND		11		ug/Kg	☼	08/02/18 12:15	08/04/18 02:01	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*85*		*43 - 129*	*08/02/18 12:15*	*08/04/18 02:01*	*1*
Tetrachloro-m-xylene	*78*		*50 - 123*	*08/02/18 12:15*	*08/04/18 02:01*	*1*

Client Sample ID: IM-SP-2-comp
Date Collected: 07/31/18 11:45
Date Received: 08/02/18 09:30

Lab Sample ID: 580-79271-2
Matrix: Solid
Percent Solids: 86.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
4,4'-DDE	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
4,4'-DDT	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Aldrin	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
alpha-BHC	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
beta-BHC	ND		5.3		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
cis-Chlordane	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
delta-BHC	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Dieldrin	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Endosulfan I	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Endosulfan II	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Endosulfan sulfate	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Endrin	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Endrin aldehyde	ND		21		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Endrin ketone	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
gamma-BHC (Lindane)	ND		2.1		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Heptachlor	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Heptachlor epoxide	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Methoxychlor	ND		11		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: IM-SP-2-comp
Date Collected: 07/31/18 11:45
Date Received: 08/02/18 09:30

Lab Sample ID: 580-79271-2
Matrix: Solid
Percent Solids: 86.5

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	ND		110		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
trans-Chlordane	ND		3.2		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1
Technical Chlordane	ND		11		ug/Kg	☼	08/02/18 12:15	08/04/18 02:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*85*		*43 - 129*	*08/02/18 12:15*	*08/04/18 02:20*	*1*
Tetrachloro-m-xylene	*83*		*50 - 123*	*08/02/18 12:15*	*08/04/18 02:20*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 580-280649/1-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 280649

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
4,4'-DDE	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
4,4'-DDT	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Aldrin	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
alpha-BHC	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
beta-BHC	ND		5.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
cis-Chlordane	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
delta-BHC	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Dieldrin	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endosulfan I	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endosulfan II	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endosulfan sulfate	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endrin	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endrin aldehyde	ND		20		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Endrin ketone	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
gamma-BHC (Lindane)	ND		2.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Heptachlor	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Heptachlor epoxide	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Methoxychlor	ND		10		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Toxaphene	ND		100		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
trans-Chlordane	ND		3.0		ug/Kg		08/02/18 09:29	08/03/18 23:27	1
Technical Chlordane	ND		10		ug/Kg		08/02/18 09:29	08/03/18 23:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*99*		*43 - 129*	*08/02/18 09:29*	*08/03/18 23:27*	*1*
Tetrachloro-m-xylene	*93*		*50 - 123*	*08/02/18 09:29*	*08/03/18 23:27*	*1*

Lab Sample ID: LCS 580-280649/2-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280649

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	20.0	18.1		ug/Kg		90	61 - 122
4,4'-DDE	20.0	16.6		ug/Kg		83	53 - 124
4,4'-DDT	20.0	19.7		ug/Kg		99	57 - 137
Aldrin	20.0	16.1		ug/Kg		80	56 - 121
alpha-BHC	20.0	14.7		ug/Kg		74	62 - 120
beta-BHC	20.0	14.9		ug/Kg		74	62 - 120
cis-Chlordane	20.0	17.1		ug/Kg		85	62 - 120
delta-BHC	20.0	16.7		ug/Kg		83	53 - 124
Dieldrin	20.0	16.1		ug/Kg		81	63 - 121
Endosulfan I	20.0	16.2		ug/Kg		81	64 - 121
Endosulfan II	20.0	15.6		ug/Kg		78	37 - 139
Endosulfan sulfate	20.0	14.7		ug/Kg		73	63 - 120
Endrin	20.0	21.8		ug/Kg		109	70 - 127
Endrin aldehyde	20.0	13.9	J	ug/Kg		70	36 - 150
Endrin ketone	20.0	16.5		ug/Kg		83	56 - 120
gamma-BHC (Lindane)	20.0	14.6		ug/Kg		73	55 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 580-280649/2-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280649

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Heptachlor			20.0	19.4		ug/Kg		97	64 - 124		
Heptachlor epoxide			20.0	15.7		ug/Kg		78	62 - 120		
Methoxychlor			20.0	19.8		ug/Kg		99	61 - 130		
trans-Chlordane			20.0	16.5		ug/Kg		83	60 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*94*		*43 - 129*
Tetrachloro-m-xylene	*89*		*50 - 123*

Lab Sample ID: LCS 580-280649/4-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280649

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Toxaphene			500	416		ug/Kg		83	57 - 126		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*83*		*43 - 129*
Tetrachloro-m-xylene	*83*		*50 - 123*

Lab Sample ID: LCSD 580-280649/3-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280649

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD			20.0	17.6		ug/Kg		88	61 - 122	3	18
4,4'-DDE			20.0	16.1		ug/Kg		80	53 - 124	3	18
4,4'-DDT			20.0	19.4		ug/Kg		97	57 - 137	1	23
Aldrin			20.0	15.6		ug/Kg		78	56 - 121	3	18
alpha-BHC			20.0	14.0		ug/Kg		70	62 - 120	5	15
beta-BHC			20.0	14.6		ug/Kg		73	62 - 120	2	19
cis-Chlordane			20.0	16.4		ug/Kg		82	62 - 120	4	18
delta-BHC			20.0	16.6		ug/Kg		83	53 - 124	1	18
Dieldrin			20.0	15.7		ug/Kg		78	63 - 121	3	19
Endosulfan I			20.0	15.5		ug/Kg		77	64 - 121	4	20
Endosulfan II			20.0	15.2		ug/Kg		76	37 - 139	3	18
Endosulfan sulfate			20.0	14.3		ug/Kg		71	63 - 120	3	19
Endrin			20.0	20.9		ug/Kg		104	70 - 127	4	20
Endrin aldehyde			20.0	13.6	J	ug/Kg		68	36 - 150	2	24
Endrin ketone			20.0	16.1		ug/Kg		80	56 - 120	3	18
gamma-BHC (Lindane)			20.0	14.4		ug/Kg		72	55 - 120	2	18
Heptachlor			20.0	18.7		ug/Kg		94	64 - 124	4	17
Heptachlor epoxide			20.0	15.1		ug/Kg		75	62 - 120	4	20
Methoxychlor			20.0	19.7		ug/Kg		98	61 - 130	0	20
trans-Chlordane			20.0	15.8		ug/Kg		79	60 - 120	4	19

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 580-280649/3-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280649

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*90*		*43 - 129*
Tetrachloro-m-xylene	*84*		*50 - 123*

Lab Sample ID: LCSD 580-280649/5-A
Matrix: Solid
Analysis Batch: 280818

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280649

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toxaphene			500	472		ug/Kg		94	57 - 126	13	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*89*		*43 - 129*
Tetrachloro-m-xylene	*85*		*50 - 123*

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79271-1

Client Sample ID: IM-SP-1-comp
Lab Sample ID: 580-79271-1
Date Collected: 07/31/18 11:32
Matrix: Solid
Date Received: 08/02/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280754	08/03/18 09:53	BAH	TAL SEA

Client Sample ID: IM-SP-1-comp
Lab Sample ID: 580-79271-1
Date Collected: 07/31/18 11:32
Matrix: Solid
Date Received: 08/02/18 09:30
Percent Solids: 88.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280649	08/02/18 12:15	SPS	TAL SEA
Total/NA	Analysis	8081B		1	280818	08/04/18 02:01	TL1	TAL SEA

Client Sample ID: IM-SP-2-comp
Lab Sample ID: 580-79271-2
Date Collected: 07/31/18 11:45
Matrix: Solid
Date Received: 08/02/18 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280754	08/03/18 09:53	BAH	TAL SEA

Client Sample ID: IM-SP-2-comp
Lab Sample ID: 580-79271-2
Date Collected: 07/31/18 11:45
Matrix: Solid
Date Received: 08/02/18 09:30
Percent Solids: 86.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280649	08/02/18 12:15	SPS	TAL SEA
Total/NA	Analysis	8081B		1	280818	08/04/18 02:20	TL1	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79271-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

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ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79307-1
Client Project/Site: 2018 Webster Nursery Cleanup

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Sierra Mott

Authorized for release by:
8/9/2018 2:00:47 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Job ID: 580-79307-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79307-1

Comments
8/8/18 sample SW4-S-5.5 (580-79307-7) was canceled by client.

Receipt
The samples were received on 8/2/2018 4:38 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.2º C.

GC Semi VOA
Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-281077 recovered high and outside the control limits for 4,4'-DDE, Aldrin, alpha-BHC, Dieldrin, Endosulfan II, Endosulfan sulfate, Endosulfan I, Endrin, Endrin ketone, Heptachlor epoxide and trans-Chlordane on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: B1-E-15 (580-79307-1), B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3), SW1-E-8 (580-79307-4), SW2-S-8 (580-79307-5), SW3-N-6.5 (580-79307-6), SW4-S-5.5 (580-79307-7), SW5-W-6.5 (580-79307-8), B4-A-10.5 (580-79307-9), (CCVIS 580-281077/8), (LCS 580-280805/2-A), (LCS 580-280805/3-A), (LCSD 580-280805/4-A), and (MB 580-280805/1-A).

Method(s) 8081B: The following continuing calibration verification (CCV) standard associated with batch 580-281077 recovered outside acceptance criteria for %D for surrogate DCB Decachlorobiphenyl. Since the %Rec is within the acceptance criteria for the surrogate in the CCV and associated samples, the data have been reported. The following samples are impacted: B1-E-15 (580-79307-1), B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3), SW1-E-8 (580-79307-4), SW2-S-8 (580-79307-5), SW3-N-6.5 (580-79307-6), SW4-S-5.5 (580-79307-7), SW5-W-6.5 (580-79307-8), B4-A-10.5 (580-79307-9), (LCS 580-280805/2-A), (LCS 580-280805/3-A), (LCSD 580-280805/4-A), (MB 580-280805/1-A), (580-79307-A-10-A), (580-79307-A-10-B MS) and (580-79307-A-10-C MSD) B1-E-15 (580-79307-1), B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3), SW1-E-8 (580-79307-4), SW2-S-8 (580-79307-5), SW3-N-6.5 (580-79307-6), SW4-S-5.5 (580-79307-7), SW5-W-6.5 (580-79307-8), B4-A-10.5 (580-79307-9), (LCS 580-280805/2-A), (LCS 580-280805/3-A), (LCSD 580-280805/4-A), and (MB 580-280805/1-A).

Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-281077 recovered outside acceptance criteria, low biased, for Endrin aldehyde. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-281127 recovered high and outside the control limits for Technical Chlordane on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3), and (CCV 580-281127/5).

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-281127 recovered low and outside the control limits for gamma-BHC (Lindane), Endrin and Methoxychlor alpha-BHC and Endrin aldehyde on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3), and (CCVIS 580-281127/6).

Method(s) 8081B: The following continuing calibration verification (CCV) standard associated with batch 580-281127 recovered outside acceptance criteria for %D for surrogate DCB Decachlorobiphenyl on the confirmation column only. Since the %Rec is within the acceptance criteria for the surrogate in the CCV and associated samples, the data have been reported. The following samples are impacted: B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3), and (CCVIS 580-281127/6).

Method(s) 8081B: The following samples were diluted to bring the concentration of target analytes within the calibration range: B2-A-10.5 (580-79307-2), B3-F-10.5 (580-79307-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Job ID: 580-79307-1 (Continued)

Laboratory: TestAmerica Seattle (Continued)

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79307-1	B1-E-15	Solid	08/02/18 09:14	08/02/18 16:38
580-79307-2	B2-A-10.5	Solid	08/02/18 10:06	08/02/18 16:38
580-79307-3	B3-F-10.5	Solid	08/02/18 10:13	08/02/18 16:38
580-79307-4	SW1-E-8	Solid	08/02/18 10:25	08/02/18 16:38
580-79307-5	SW2-S-8	Solid	08/02/18 10:30	08/02/18 16:38
580-79307-6	SW3-N-6.5	Solid	08/02/18 12:11	08/02/18 16:38
580-79307-8	SW5-W-6.5	Solid	08/02/18 14:28	08/02/18 16:38
580-79307-9	B4-A-10.5	Solid	08/02/18 13:56	08/02/18 16:38

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☐ Rush
☐ Short Hold

Chain of Custody Record

Client: Landau Associates, Inc.	Client Contact: Sierra Mott smott@landauinc.com	Date: 8/2/18	Chain of Custody Number: 36903
Address: 2107 S C St	Telephone Number (Area Code)/Fax Number: (253) 225-5743	Lab Number: 79307	Page 1 of 2
City: Tacoma / State: WA / Zip Code: 98402	Sampler: Annabel Warnell	Lab Contact: Sheri Cruz	
Project Name and Location (State): 2018 Webster Nursery Cleanup, WA	Billing Contact: Sierra Mott		
Contract/Purchase Order/Quote No.: 0774006.040.044			

Analysis (Attach list if more space is needed): Pesticides EPA 8081B

Special Instructions/ Conditions of Receipt

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Pesticides EPA 8081B
-1	B1-E-15	8/2/18	9:14				X	X						X
	B2-A-10.5		10:06				X	X						X
-3	B3-F-10.5		10:13				X	X						X
	SW1-E-8		10:25				X	X						X
-5	SW2-S-8		10:30				X	X						X
	SW3-N-6.5		12:11				X	X						X
-7	SW4-S-5.5		14:06				X	X						X
	SW5-W-6.5		14:28				X	X						X
-9	B4-A-10.5		13:52				X	X						X

On ice

Therm. ID: A2 Cor: 2.2 ° Unc: 2.1 °
Cooler Dsc: Sm Blue
Packing: Bub
Cust. Seal: Yes ___ No ✓
Ice/Packs/Dry Ice/None
FedEx: ___
UPS: ___
Lab Cour: ___
Other: CD

580-79307 Chain of Custody

Cooler: ☑ Yes ☐ No Cooler Temp: ___

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For ___ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☑ 15 Days (Standard) ☐ Other ___

QC Requirements (Specify)

1. Relinquished By Sign/Print	Annabel Warnell	Date: 8/2/18	Time: 16:38	1. Received By Sign/Print	Thea Hobbs	Date: 8.2.18 / Time: 1638
2. Relinquished By Sign/Print		Date	Time	2. Received By Sign/Print		Date / Time
3. Relinquished By Sign/Print		Date	Time	3. Received By Sign/Print		Date / Time

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

8/9/2018

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www.testamericainc.com

☐ Rush
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Chain of Custody Record

Client: Landau Associates, Inc.	Client Contact: Sierra Mott smott@landauinc.com	Date: 8/2/18	Chain of Custody Number: 36904
Address: 2107 S C St	Telephone Number (Area Code)/Fax Number: (253) 225-5743	Lab Number: 79307	Page 2 of 2
City: Tacoma / State: WA / Zip Code: 98402	Sampler: Annabel Warnell	Lab Contact: Sheri Cruz	
Project Name and Location (State): 2018 Webster Nursery Cleanup, WA	Billing Contact: Sierra Mott		
Contract/Purchase Order/Quote No.: 0774006.040.044			

Analysis (Attach list if more space is needed): Pesticides EPA 8081B

Special Instructions/ Conditions of Receipt

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Pesticides EPA 8081B	Special Instructions/ Conditions of Receipt
-10	EX-SP-2-comp	8/2/18	14:40				X	X						X	On ice

Therm. ID: A2 Cor: 7.2 ° Unc: 7.1 °
Cooler Dsc: Sm Blk FedEx:
Packing: Bub UPS:
Cust. Seal: Yes No Lab Cour:
Wet/Packs/Dry Ice/None Other: CD

Cooler: ☑ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☑ Other 72 hours

QC Requirements (Specify):

	Relinquished By Sign/Print	Date	Time	Received By Sign/Print	Date	Time
1.	Annabel Warnell	8/2/18	16:38	Ken Tibbs	8-2-18	1638
2.						
3.						

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

8/9/2018

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Tacoma, WA 98424
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Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: Landau Associates, Inc.	Client Contact: Sierra Mott smott@landauinc.com	Date: 8/2/18	Chain of Custody Number: 36903
Address: 2107 S C St	Telephone Number (Area Code)/Fax Number: (253) 225-5743	Lab Number:	Page 1 of 2
City: Tacoma / State: WA / Zip Code: 98402	Sampler: Annabel Warnell	Lab Contact: Sheri Cruz	
Project Name and Location (State): 24th & Webster Nursery Cleanup, WA	Billing Contact: Sierra Mott		
Contract/Purchase Order/Quote No.: 0774006.040.044			

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Analysis (Attach list if more space is needed): Provides EPH 9043B	Special Instructions/ Conditions of Receipt
B1-E-15	8/2/18	9:14				X	X						X	On ice
B2-A-10.5		10:06				X	X						X	
B3-F-10.5		10:13				X	X						X	
SW1-E-8		10:25				X	X						X	
SW2-S-8		10:30				X	X						X	
SW3-N-6.5		12:11				X	X						X	
~~SW4-S-5.5~~		~~14:06~~				X	X						X	
SW5-W-6.5		14:28				X	X						X	
B4-A-10.5		13:56				X	X						X	

Cancel analysis for SW4-S-5.5 -SMM, 8/8/18

Cooler: ☑ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☑ 15 Days (Standard) ☐ Other _____

QC Requirements (Specify):

1. Relinquished By Sign/Print: Annabel Warnell	Date: 8/2/18	Time: 16:30	1. Received By Sign/Print:	Date:	Time:
2. Relinquished By Sign/Print:	Date:	Time:	2. Received By Sign/Print:	Date:	Time:
3. Relinquished By Sign/Print:	Date:	Time:	3. Received By Sign/Print:	Date:	Time:

Comments:

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-79307-1

Login Number: 79307
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8081B - Organochlorine Pesticides (GC)

Client Sample ID: B1-E-15
Date Collected: 08/02/18 09:14
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-1
Matrix: Solid
Percent Solids: 71.3

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
4,4'-DDE	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
4,4'-DDT	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Aldrin	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
alpha-BHC	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
beta-BHC	ND		6.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
cis-Chlordane	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
delta-BHC	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Dieldrin	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Endosulfan I	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Endosulfan II	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Endosulfan sulfate	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Endrin	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Endrin aldehyde	ND		27		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Endrin ketone	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
gamma-BHC (Lindane)	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Heptachlor	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Heptachlor epoxide	**11**		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Methoxychlor	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Toxaphene	ND		140		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
trans-Chlordane	**15**		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1
Technical Chlordane	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 20:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*77*		*43 - 129*	*08/03/18 15:25*	*08/07/18 20:25*	*1*
Tetrachloro-m-xylene	*74*		*50 - 123*	*08/03/18 15:25*	*08/07/18 20:25*	*1*

Client Sample ID: B2-A-10.5
Date Collected: 08/02/18 10:06
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-2
Matrix: Solid
Percent Solids: 69.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
4,4'-DDE	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
4,4'-DDT	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Aldrin	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
alpha-BHC	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
beta-BHC	ND		6.9		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
cis-Chlordane	**26**		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
delta-BHC	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Dieldrin	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Endosulfan I	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Endosulfan II	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Endosulfan sulfate	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Endrin	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Endrin aldehyde	ND		28		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Endrin ketone	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
gamma-BHC (Lindane)	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Heptachlor	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Heptachlor epoxide	**16**		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
Methoxychlor	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: B2-A-10.5
Date Collected: 08/02/18 10:06
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-2
Matrix: Solid
Percent Solids: 69.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	ND		140		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1
trans-Chlordane	**130**		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 20:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*80*		*43 - 129*	*08/03/18 15:25*	*08/07/18 20:44*	*1*
Tetrachloro-m-xylene	*78*		*50 - 123*	*08/03/18 15:25*	*08/07/18 20:44*	*1*

Client Sample ID: B3-F-10.5
Date Collected: 08/02/18 10:13
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-3
Matrix: Solid
Percent Solids: 67.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
4,4'-DDE	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
4,4'-DDT	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Aldrin	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
alpha-BHC	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
beta-BHC	ND		7.2		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
cis-Chlordane	**140**		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
delta-BHC	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Dieldrin	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Endosulfan I	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Endosulfan II	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Endosulfan sulfate	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Endrin	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Endrin aldehyde	ND		29		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Endrin ketone	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
gamma-BHC (Lindane)	ND		2.9		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Heptachlor	**4.9**		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Heptachlor epoxide	**49**		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Methoxychlor	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1
Toxaphene	ND		140		ug/Kg	☼	08/03/18 15:25	08/07/18 21:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*66*		*43 - 129*	*08/03/18 15:25*	*08/07/18 21:03*	*1*
Tetrachloro-m-xylene	*74*		*50 - 123*	*08/03/18 15:25*	*08/07/18 21:03*	*1*

Client Sample ID: SW1-E-8
Date Collected: 08/02/18 10:25
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-4
Matrix: Solid
Percent Solids: 68.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
4,4'-DDE	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
4,4'-DDT	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Aldrin	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
alpha-BHC	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
beta-BHC	ND		7.1		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
cis-Chlordane	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
delta-BHC	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Dieldrin	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Endosulfan I	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SW1-E-8
Date Collected: 08/02/18 10:25
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-4
Matrix: Solid
Percent Solids: 68.9

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Endosulfan II	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Endosulfan sulfate	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Endrin	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Endrin aldehyde	ND		28		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Endrin ketone	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
gamma-BHC (Lindane)	ND		2.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Heptachlor	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Heptachlor epoxide	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Methoxychlor	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Toxaphene	ND		140		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
trans-Chlordane	ND		4.3		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1
Technical Chlordane	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 21:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*77*		*43 - 129*	*08/03/18 15:25*	*08/07/18 21:23*	*1*
Tetrachloro-m-xylene	*76*		*50 - 123*	*08/03/18 15:25*	*08/07/18 21:23*	*1*

Client Sample ID: SW2-S-8
Date Collected: 08/02/18 10:30
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-5
Matrix: Solid
Percent Solids: 72.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
4,4'-DDE	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
4,4'-DDT	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Aldrin	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
alpha-BHC	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
beta-BHC	ND		6.8		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
cis-Chlordane	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
delta-BHC	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Dieldrin	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Endosulfan I	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Endosulfan II	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Endosulfan sulfate	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Endrin	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Endrin aldehyde	ND		27		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Endrin ketone	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
gamma-BHC (Lindane)	ND		2.7		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Heptachlor	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Heptachlor epoxide	**11**		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Methoxychlor	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Toxaphene	ND		140		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
trans-Chlordane	ND		4.1		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1
Technical Chlordane	ND		14		ug/Kg	☼	08/03/18 15:25	08/07/18 21:42	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*74*		*43 - 129*	*08/03/18 15:25*	*08/07/18 21:42*	*1*
Tetrachloro-m-xylene	*77*		*50 - 123*	*08/03/18 15:25*	*08/07/18 21:42*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Client Sample ID: SW3-N-6.5
Date Collected: 08/02/18 12:11
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-6
Matrix: Solid
Percent Solids: 75.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
4,4'-DDE	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
4,4'-DDT	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Aldrin	ND		4.0		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
alpha-BHC	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
beta-BHC	ND		6.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
cis-Chlordane	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
delta-BHC	ND		4.0		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Dieldrin	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Endosulfan I	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Endosulfan II	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Endosulfan sulfate	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Endrin	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Endrin aldehyde	ND		26		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Endrin ketone	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
gamma-BHC (Lindane)	ND		2.6		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Heptachlor	ND		4.0		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Heptachlor epoxide	ND		4.0		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Methoxychlor	ND		13		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Toxaphene	ND		130		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
trans-Chlordane	ND		4.0		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1
Technical Chlordane	ND		13		ug/Kg	☼	08/03/18 15:25	08/07/18 22:02	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*81*		*43 - 129*	*08/03/18 15:25*	*08/07/18 22:02*	*1*
Tetrachloro-m-xylene	*78*		*50 - 123*	*08/03/18 15:25*	*08/07/18 22:02*	*1*

Client Sample ID: SW5-W-6.5
Date Collected: 08/02/18 14:28
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-8
Matrix: Solid
Percent Solids: 81.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
4,4'-DDE	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
4,4'-DDT	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Aldrin	ND		3.5		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
alpha-BHC	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
beta-BHC	ND		5.9		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
cis-Chlordane	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
delta-BHC	ND		3.5		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Dieldrin	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Endosulfan I	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Endosulfan II	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Endosulfan sulfate	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Endrin	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Endrin aldehyde	ND		24		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Endrin ketone	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
gamma-BHC (Lindane)	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Heptachlor	ND		3.5		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Heptachlor epoxide	ND		3.5		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Methoxychlor	ND		12		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SW5-W-6.5
Date Collected: 08/02/18 14:28
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-8
Matrix: Solid
Percent Solids: 81.6

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	ND		120		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
trans-Chlordane	ND		3.5		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1
Technical Chlordane	ND		12		ug/Kg	☼	08/03/18 15:25	08/07/18 22:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*75*		*43 - 129*	*08/03/18 15:25*	*08/07/18 22:40*	*1*
Tetrachloro-m-xylene	*74*		*50 - 123*	*08/03/18 15:25*	*08/07/18 22:40*	*1*

Client Sample ID: B4-A-10.5
Date Collected: 08/02/18 13:56
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-9
Matrix: Solid
Percent Solids: 82.1

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
4,4'-DDE	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
4,4'-DDT	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Aldrin	ND		3.6		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
alpha-BHC	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
beta-BHC	ND		6.1		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
cis-Chlordane	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
delta-BHC	ND		3.6		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Dieldrin	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Endosulfan I	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Endosulfan II	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Endosulfan sulfate	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Endrin	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Endrin aldehyde	ND		24		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Endrin ketone	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
gamma-BHC (Lindane)	ND		2.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Heptachlor	ND		3.6		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Heptachlor epoxide	ND		3.6		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Methoxychlor	ND		12		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Toxaphene	ND		120		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
trans-Chlordane	ND		3.6		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1
Technical Chlordane	ND		12		ug/Kg	☼	08/03/18 15:25	08/07/18 23:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*84*		*43 - 129*	*08/03/18 15:25*	*08/07/18 23:00*	*1*
Tetrachloro-m-xylene	*82*		*50 - 123*	*08/03/18 15:25*	*08/07/18 23:00*	*1*

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Method: 8081B - Organochlorine Pesticides (GC) - DL

Client Sample ID: B2-A-10.5
Date Collected: 08/02/18 10:06
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-2
Matrix: Solid
Percent Solids: 69.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technical Chlordane	330		140		ug/Kg	☼	08/03/18 15:25	08/08/18 15:01	10

Client Sample ID: B3-F-10.5
Date Collected: 08/02/18 10:13
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-3
Matrix: Solid
Percent Solids: 67.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
trans-Chlordane	730		43		ug/Kg	☼	08/03/18 15:25	08/08/18 13:43	10

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Method: 8081B - Organochlorine Pesticides (GC) - DL2

Client Sample ID: B3-F-10.5
Date Collected: 08/02/18 10:13
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-3
Matrix: Solid
Percent Solids: 67.2

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Technical Chlordane	2300		720		ug/Kg	☼	08/03/18 15:25	08/08/18 15:21	50

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 580-280805/1-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 280805

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
4,4'-DDE	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
4,4'-DDT	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Aldrin	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
alpha-BHC	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
beta-BHC	ND		5.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
cis-Chlordane	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
delta-BHC	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Dieldrin	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endosulfan I	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endosulfan II	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endosulfan sulfate	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endrin	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endrin aldehyde	ND		20		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endrin ketone	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
gamma-BHC (Lindane)	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Heptachlor	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Heptachlor epoxide	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Methoxychlor	ND		10		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Toxaphene	ND		100		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
trans-Chlordane	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Technical Chlordane	ND		10		ug/Kg		08/03/18 15:25	08/07/18 19:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*84*		*43 - 129*	*08/03/18 15:25*	*08/07/18 19:07*	*1*
Tetrachloro-m-xylene	*82*		*50 - 123*	*08/03/18 15:25*	*08/07/18 19:07*	*1*

Lab Sample ID: LCS 580-280805/2-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	20.0	17.7		ug/Kg		89	61 - 122
4,4'-DDE	20.0	19.1		ug/Kg		96	53 - 124
4,4'-DDT	20.0	19.2		ug/Kg		96	57 - 137
Aldrin	20.0	17.1		ug/Kg		85	56 - 121
alpha-BHC	20.0	18.0		ug/Kg		90	62 - 120
beta-BHC	20.0	15.5		ug/Kg		78	62 - 120
cis-Chlordane	20.0	16.7		ug/Kg		83	62 - 120
delta-BHC	20.0	17.2		ug/Kg		86	53 - 124
Dieldrin	20.0	18.7		ug/Kg		94	63 - 121
Endosulfan I	20.0	18.3		ug/Kg		92	64 - 121
Endosulfan II	20.0	17.2		ug/Kg		86	37 - 139
Endosulfan sulfate	20.0	18.2		ug/Kg		91	63 - 120
Endrin	20.0	20.8		ug/Kg		104	70 - 127
Endrin aldehyde	20.0	13.8	J	ug/Kg		69	36 - 150
Endrin ketone	20.0	19.1		ug/Kg		96	56 - 120
gamma-BHC (Lindane)	20.0	16.6		ug/Kg		83	55 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 580-280805/2-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Heptachlor	20.0	18.3		ug/Kg		92	64 - 124
Heptachlor epoxide	20.0	18.9		ug/Kg		95	62 - 120
Methoxychlor	20.0	19.5		ug/Kg		98	61 - 130
trans-Chlordane	20.0	19.2		ug/Kg		96	60 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*80*		*43 - 129*
Tetrachloro-m-xylene	*80*		*50 - 123*

Lab Sample ID: LCS 580-280805/3-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technical Chlordane	100	103		ug/Kg		103	20 - 132

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*82*		*43 - 129*
Tetrachloro-m-xylene	*83*		*50 - 123*

Lab Sample ID: LCSD 580-280805/4-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technical Chlordane	100	102		ug/Kg		102	20 - 132	1	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*84*		*43 - 129*
Tetrachloro-m-xylene	*80*		*50 - 123*

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Client Sample ID: B1-E-15
Date Collected: 08/02/18 09:14
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: B1-E-15
Date Collected: 08/02/18 09:14
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-1
Matrix: Solid
Percent Solids: 71.3

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 20:25	TL1	TAL SEA

Client Sample ID: B2-A-10.5
Date Collected: 08/02/18 10:06
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: B2-A-10.5
Date Collected: 08/02/18 10:06
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-2
Matrix: Solid
Percent Solids: 69.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 20:44	TL1	TAL SEA
Total/NA	Prep	3546	DL		280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B	DL	10	281127	08/08/18 15:01	APR	TAL SEA

Client Sample ID: B3-F-10.5
Date Collected: 08/02/18 10:13
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: B3-F-10.5
Date Collected: 08/02/18 10:13
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-3
Matrix: Solid
Percent Solids: 67.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 21:03	TL1	TAL SEA
Total/NA	Prep	3546	DL		280805	08/03/18 15:25	KMS	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Client Sample ID: B3-F-10.5
Date Collected: 08/02/18 10:13
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-3
Matrix: Solid
Percent Solids: 67.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8081B	DL	10	281127	08/08/18 13:43	APR	TAL SEA
Total/NA	Prep	3546	DL2		280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B	DL2	50	281127	08/08/18 15:21	APR	TAL SEA

Client Sample ID: SW1-E-8
Date Collected: 08/02/18 10:25
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-4
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: SW1-E-8
Date Collected: 08/02/18 10:25
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-4
Matrix: Solid
Percent Solids: 68.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 21:23	TL1	TAL SEA

Client Sample ID: SW2-S-8
Date Collected: 08/02/18 10:30
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-5
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: SW2-S-8
Date Collected: 08/02/18 10:30
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-5
Matrix: Solid
Percent Solids: 72.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 21:42	TL1	TAL SEA

Client Sample ID: SW3-N-6.5
Date Collected: 08/02/18 12:11
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Client Sample ID: SW3-N-6.5

Lab Sample ID: 580-79307-6
Date Collected: 08/02/18 12:11
Matrix: Solid
Date Received: 08/02/18 16:38
Percent Solids: 75.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 22:02	TL1	TAL SEA

Client Sample ID: SW5-W-6.5

Lab Sample ID: 580-79307-8
Date Collected: 08/02/18 14:28
Matrix: Solid
Date Received: 08/02/18 16:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: SW5-W-6.5

Lab Sample ID: 580-79307-8
Date Collected: 08/02/18 14:28
Matrix: Solid
Date Received: 08/02/18 16:38
Percent Solids: 81.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 22:40	TL1	TAL SEA

Client Sample ID: B4-A-10.5

Lab Sample ID: 580-79307-9
Date Collected: 08/02/18 13:56
Matrix: Solid
Date Received: 08/02/18 16:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: B4-A-10.5

Lab Sample ID: 580-79307-9
Date Collected: 08/02/18 13:56
Matrix: Solid
Date Received: 08/02/18 16:38
Percent Solids: 82.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 23:00	TL1	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-1

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79307-2
Client Project/Site: 2018 Webster Nursery Cleanup

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Sierra Mott

Authorized for release by:
8/9/2018 1:28:11 PM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Job ID: 580-79307-2

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79307-2

Comments
No additional comments.

Receipt
The samples were received on 8/2/2018 4:38 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.2º C.

GC Semi VOA
RPD for LCS/LCSD 281077 is reporting as NaN?

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-281077 recovered high and outside the control limits for 4,4'-DDE, Aldrin, alpha-BHC, Dieldrin, Endosulfan II, Endosulfan sulfate, Endosulfan I, Endrin, Endrin ketone, Heptachlor epoxide and trans-Chlordane on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: EX-SP-2-Comp (580-79307-10), (CCVIS 580-281077/8), (LCS 580-280805/2-A), (LCS 580-280805/3-A), (LCSD 580-280805/4-A), (MB 580-280805/1-A), (580-79307-10 MS) and (580-79307-10 MSD).

Method(s) 8081B: The following continuing calibration verification (CCV) standard associated with batch 580-281077 recovered outside acceptance criteria for %D for surrogate DCB Decachlorobiphenyl. Since the %Rec is within the acceptance criteria for the surrogate in the CCV and associated samples, the data have been reported. The following samples are impacted: EX-SP-2-Comp (580-79307-10), (LCS 580-280805/2-A), (LCS 580-280805/3-A), (LCSD 580-280805/4-A), (MB 580-280805/1-A), (580-79307-10 MS) and (580-79307-10 MSD)

Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-281077 recovered outside acceptance criteria, low biased, for Endrin aldehyde. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-281127 recovered high and outside the control limits for Technical Chlordane on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: EX-SP-2-Comp (580-79307-10), (CCV 580-281127/5), (580-79307-10 MS) and (580-79307-10 MSD).

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-281127 recovered low and outside the control limits for gamma-BHC (Lindane), Endrin and Methoxychlor alpha-BHC and Endrin aldehyde on one column. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: EX-SP-2-Comp (580-79307-10), (CCVIS 580-281127/6), (580-79307-10 MS) and (580-79307-10 MSD).

Method(s) 8081B: The following continuing calibration verification (CCV) standard associated with batch 580-281127 recovered outside acceptance criteria for %D for surrogate DCB Decachlorobiphenyl on the confirmation column only. Since the %Rec is within the acceptance criteria for the surrogate in the CCV and associated samples, the data have been reported. The following samples are impacted: EX-SP-2-Comp (580-79307-10), (CCVIS 580-281127/6), (580-79307-10 MS) and (580-79307-10 MSD)

Method(s) 8081B: The matrix spike (MS) recoveries for preparation batch 580-280805 and analytical batch 580-281077 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method(s) 8081B: The following samples were diluted due to the nature of the sample matrix: (580-79307-10 MS) and (580-79307-10 MSD). Because of this dilution, the surrogate spike and matrix spike concentration in the sample was reduced to a level where the recovery calculation does not provide useful information.

Method(s) 8081B: The following samples were diluted to bring the concentration of target analytes within the calibration range: EX-SP-2-Comp (580-79307-10), (580-79307-10 MS) and (580-79307-10 MSD). Elevated reporting limits (RLs) are provided.

Job ID: 580-79307-2 (Continued)

Laboratory: TestAmerica Seattle (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
E	Result exceeded calibration range.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79307-10	EX-SP-2-Comp	Solid	08/02/18 14:40	08/02/18 16:38

TestAmerica
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TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
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www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: Landau Associates, Inc.	Client Contact: Sierra Mott smott@landauinc.com	Date: 8/2/18	Chain of Custody Number: 36903
Address: 2107 S C St	Telephone Number (Area Code)/Fax Number: (253) 225-5743	Lab Number: 79307	Page 1 of 2
City: Tacoma / State: WA / Zip Code: 98402	Sampler: Annabel Warnell	Lab Contact: Sheri Cruz	
Project Name and Location (State): 2018 Webster Nursery Cleanup, WA	Billing Contact: Sierra Mott		
Contract/Purchase Order/Quote No.: 0774006.040.044			

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis (Attach list if more space is needed): Pesticides EPA 8081B
-1	B1-E-15	8/2/18	9:14				X	X						X
	B2-A-10.5		10:06				X	X						X
-3	B3-F-10.5		10:13				X	X						X
	SW1-E-8		10:25				X	X						X
-5	SW2-S-8		10:30				X	X						X
	SW3-N-6.5		12:11				X	X						X
-7	SW4-S-5.5		14:06				X	X						X
	SW5-W-6.5		14:28				X	X						X
-9	B4-A-10.5		13:52				X	X						X

Special Instructions/ Conditions of Receipt

On ice

Therm. ID: A2 Cor: 2.2 ° Unc: 2.1 °
Cooler Dsc: Sm Blue
Packing: Bub
Cust. Seal: Yes ___ No ✓
Wet/Packs/Dry Ice/None
FedEx: ___
UPS: ___
Lab Cour: ___
Other: CD

580-79307 Chain of Custody

Cooler: ☑ Yes ☐ No Cooler Temp: ___

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For ___ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☑ 15 Days (Standard) ☐ Other ___

QC Requirements (Specify)

1. Relinquished By Sign/Print	Annabel Warnell	Date 8/2/18	Time 16:38	1. Received By Sign/Print	Thea Hobbs	Date 8.2.18	Time 1638
2. Relinquished By Sign/Print		Date	Time	2. Received By Sign/Print		Date	Time
3. Relinquished By Sign/Print		Date	Time	3. Received By Sign/Print		Date	Time

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

8/9/2018

TestAmerica
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TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: Landau Associates, Inc.	Client Contact: Sierra Mott smott@landauinc.com	Date: 8/2/18	Chain of Custody Number: 36904
Address: 2107 S C St	Telephone Number (Area Code)/Fax Number: (253) 225-5743	Lab Number: 79307	Page 2 of 2
City: Tacoma / State: WA / Zip Code: 98402	Sampler: Annabel Warnell	Lab Contact: Sheri Cruz	
Project Name and Location (State): 2018 Webster Nursery Cleanup, WA	Billing Contact: Sierra Mott		
Contract/Purchase Order/Quote No.: 0774006.040.044			

Analysis (Attach list if more space is needed): Pesticides EPA 8081B

Special Instructions/ Conditions of Receipt

	Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Pesticides EPA 8081B	Special Instructions/ Conditions of Receipt
-10	EX-SP-2-comp	8/2/18	14:40				X	X						X	On ice

Therm. ID: A2 Cor: 7.2 ° Unc: 7.1 °
Cooler Dsc: Sm Blk FedEx:
Packing: Bub UPS:
Cust. Seal: Yes No Lab Cour:
Wet/Packs/Dry Ice/None Other: CD

Cooler: ☑ Yes ☐ No Cooler Temp: _____

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☐ 15 Days ☑ Other 72 hours

QC Requirements (Specify):

	Relinquished By Sign/Print	Date	Time	Received By Sign/Print	Date	Time
1.	Annabel Warnell	8/2/18	16:38	Ken Tibbs	8-2-18	1638
2.						
3.						

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

8/9/2018

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-79307-2

Login Number: 79307
List Number: 1
Creator: Blankinship, Tom X

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8081B - Organochlorine Pesticides (GC)

Client Sample ID: EX-SP-2-Comp
Date Collected: 08/02/18 14:40
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-10
Matrix: Solid
Percent Solids: 89.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
4,4'-DDE	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
4,4'-DDT	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Aldrin	ND		3.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
alpha-BHC	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
beta-BHC	ND		5.4		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
cis-Chlordane	**33**	**F1**	2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
delta-BHC	ND		3.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Dieldrin	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Endosulfan I	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Endosulfan II	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Endosulfan sulfate	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Endrin	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Endrin aldehyde	ND		22		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Endrin ketone	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
gamma-BHC (Lindane)	ND		2.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Heptachlor	**89**		3.2		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Methoxychlor	ND		11		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1
Toxaphene	ND		110		ug/Kg	☼	08/03/18 15:25	08/07/18 23:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*86*		*43 - 129*	*08/03/18 15:25*	*08/07/18 23:19*	*1*
Tetrachloro-m-xylene	*78*		*50 - 123*	*08/03/18 15:25*	*08/07/18 23:19*	*1*

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-2

Method: 8081B - Organochlorine Pesticides (GC) - DL

Client Sample ID: EX-SP-2-Comp
Date Collected: 08/02/18 14:40
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-10
Matrix: Solid
Percent Solids: 89.8

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Heptachlor epoxide	130	F1	32		ug/Kg	☼	08/03/18 15:25	08/08/18 14:02	10
trans-Chlordane	230		32		ug/Kg	☼	08/03/18 15:25	08/08/18 14:02	10
Technical Chlordane	1500		110		ug/Kg	☼	08/03/18 15:25	08/08/18 14:02	10

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 580-280805/1-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 280805

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
4,4'-DDE	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
4,4'-DDT	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Aldrin	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
alpha-BHC	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
beta-BHC	ND		5.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
cis-Chlordane	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
delta-BHC	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Dieldrin	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endosulfan I	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endosulfan II	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endosulfan sulfate	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endrin	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endrin aldehyde	ND		20		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Endrin ketone	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
gamma-BHC (Lindane)	ND		2.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Heptachlor	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Heptachlor epoxide	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Methoxychlor	ND		10		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Toxaphene	ND		100		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
trans-Chlordane	ND		3.0		ug/Kg		08/03/18 15:25	08/07/18 19:07	1
Technical Chlordane	ND		10		ug/Kg		08/03/18 15:25	08/07/18 19:07	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*84*		*43 - 129*	*08/03/18 15:25*	*08/07/18 19:07*	*1*
Tetrachloro-m-xylene	*82*		*50 - 123*	*08/03/18 15:25*	*08/07/18 19:07*	*1*

Lab Sample ID: LCS 580-280805/2-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	20.0	17.7		ug/Kg		89	61 - 122
4,4'-DDE	20.0	19.1		ug/Kg		96	53 - 124
4,4'-DDT	20.0	19.2		ug/Kg		96	57 - 137
Aldrin	20.0	17.1		ug/Kg		85	56 - 121
alpha-BHC	20.0	18.0		ug/Kg		90	62 - 120
beta-BHC	20.0	15.5		ug/Kg		78	62 - 120
cis-Chlordane	20.0	16.7		ug/Kg		83	62 - 120
delta-BHC	20.0	17.2		ug/Kg		86	53 - 124
Dieldrin	20.0	18.7		ug/Kg		94	63 - 121
Endosulfan I	20.0	18.3		ug/Kg		92	64 - 121
Endosulfan II	20.0	17.2		ug/Kg		86	37 - 139
Endosulfan sulfate	20.0	18.2		ug/Kg		91	63 - 120
Endrin	20.0	20.8		ug/Kg		104	70 - 127
Endrin aldehyde	20.0	13.8	J	ug/Kg		69	36 - 150
Endrin ketone	20.0	19.1		ug/Kg		96	56 - 120
gamma-BHC (Lindane)	20.0	16.6		ug/Kg		83	55 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 580-280805/2-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280805

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Heptachlor			20.0	18.3		ug/Kg		92	64 - 124		
Heptachlor epoxide			20.0	18.9		ug/Kg		95	62 - 120		
Methoxychlor			20.0	19.5		ug/Kg		98	61 - 130		
trans-Chlordane			20.0	19.2		ug/Kg		96	60 - 120		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*80*		*43 - 129*
Tetrachloro-m-xylene	*80*		*50 - 123*

Lab Sample ID: LCS 580-280805/3-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 280805

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Technical Chlordane			100	103		ug/Kg		103	20 - 132		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*82*		*43 - 129*
Tetrachloro-m-xylene	*83*		*50 - 123*

Lab Sample ID: LCSD 580-280805/4-A
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 280805

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technical Chlordane			100	102		ug/Kg		102	20 - 132	1	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*84*		*43 - 129*
Tetrachloro-m-xylene	*80*		*50 - 123*

Lab Sample ID: 580-79307-10 MS
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: EX-SP-2-Comp
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	ND		21.9	18.5		ug/Kg	☼	85	61 - 122
4,4'-DDE	ND		21.9	17.6		ug/Kg	☼	81	53 - 124
4,4'-DDT	ND		21.9	19.6		ug/Kg	☼	90	57 - 137
Aldrin	ND		21.9	17.0		ug/Kg	☼	78	56 - 121
alpha-BHC	ND	F2	21.9	17.8		ug/Kg	☼	82	62 - 120
beta-BHC	ND		21.9	15.9		ug/Kg	☼	73	62 - 120
cis-Chlordane	33	F1	21.9	41.9	F1	ug/Kg	☼	40	62 - 120
delta-BHC	ND		21.9	17.8		ug/Kg	☼	81	53 - 124
Dieldrin	ND		21.9	17.1		ug/Kg	☼	78	63 - 121
Endosulfan I	ND		21.9	15.7		ug/Kg	☼	72	64 - 121
Endosulfan II	ND		21.9	14.7		ug/Kg	☼	67	37 - 139

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 580-79307-10 MS
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: EX-SP-2-Comp
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Endosulfan sulfate	ND		21.9	15.5		ug/Kg	☼	71	63 - 120
Endrin	ND		21.9	22.1		ug/Kg	☼	101	70 - 127
Endrin aldehyde	ND		21.9	ND		ug/Kg	☼	59	36 - 150
Endrin ketone	ND		21.9	16.5		ug/Kg	☼	76	56 - 120
gamma-BHC (Lindane)	ND		21.9	16.3		ug/Kg	☼	75	55 - 120
Heptachlor	89		21.9	66.6	4	ug/Kg	☼	-100	64 - 124
Methoxychlor	ND		21.9	20.5		ug/Kg	☼	94	61 - 130
trans-Chlordane	190		21.9	229	E 4	ug/Kg	☼	184	60 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*79*		*43 - 129*
Tetrachloro-m-xylene	*79*		*50 - 123*

Lab Sample ID: 580-79307-10 MSD
Matrix: Solid
Analysis Batch: 281077

Client Sample ID: EX-SP-2-Comp
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	ND		21.4	18.0		ug/Kg	☼	84	61 - 122	3	18
4,4'-DDE	ND		21.4	17.3		ug/Kg	☼	81	53 - 124	3	18
4,4'-DDT	ND		21.4	19.2		ug/Kg	☼	90	57 - 137	2	23
Aldrin	ND		21.4	16.8		ug/Kg	☼	78	56 - 121	7	18
alpha-BHC	ND		21.4	17.4		ug/Kg	☼	81	62 - 120	14	15
beta-BHC	ND		21.4	15.5		ug/Kg	☼	72	62 - 120	3	19
cis-Chlordane	33	F1	21.4	46.5		ug/Kg	☼	63	62 - 120	10	18
delta-BHC	ND		21.4	17.5		ug/Kg	☼	82	53 - 124	2	18
Dieldrin	ND		21.4	17.0		ug/Kg	☼	79	63 - 121	2	19
Endosulfan I	ND		21.4	15.7		ug/Kg	☼	73	64 - 121	0	20
Endosulfan II	ND		21.4	14.5		ug/Kg	☼	68	37 - 139	4	18
Endosulfan sulfate	ND		21.4	15.2		ug/Kg	☼	71	63 - 120	7	19
Endrin	ND		21.4	21.6		ug/Kg	☼	101	70 - 127	2	20
Endrin aldehyde	ND		21.4	ND		ug/Kg	☼	58	36 - 150	4	24
Endrin ketone	ND		21.4	16.5		ug/Kg	☼	77	56 - 120	7	18
gamma-BHC (Lindane)	ND		21.4	16.0		ug/Kg	☼	75	55 - 120	2	18
Heptachlor	89		21.4	71.2	4	ug/Kg	☼	-81	64 - 124	7	17
Methoxychlor	ND		21.4	21.0		ug/Kg	☼	98	61 - 130	2	20
trans-Chlordane	230	E	21.4	236	E 4	ug/Kg	☼	47	60 - 120	15	19

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*90*		*43 - 129*
Tetrachloro-m-xylene	*81*		*50 - 123*

Method: 8081B - Organochlorine Pesticides (GC) - DL

Lab Sample ID: 580-79307-10 MS
Matrix: Solid
Analysis Batch: 281127

Client Sample ID: EX-SP-2-Comp
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
Heptachlor epoxide - DL	130	F1	21.9	142	4	ug/Kg	☼	32	62 - 120		
trans-Chlordane - DL	230		21.9	242	4	ug/Kg	☼	74	60 - 120		

Lab Sample ID: 580-79307-10 MSD
Matrix: Solid
Analysis Batch: 281127

Client Sample ID: EX-SP-2-Comp
Prep Type: Total/NA
Prep Batch: 280805

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Heptachlor epoxide - DL	130	F1	21.4	151	F1	ug/Kg	☼	707	62 - 120	NC	20
trans-Chlordane - DL	230		21.4	240	4	ug/Kg	☼	68	60 - 120	1	19

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-2

Client Sample ID: EX-SP-2-Comp
Date Collected: 08/02/18 14:40
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-10
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	280830	08/04/18 09:35	BAH	TAL SEA

Client Sample ID: EX-SP-2-Comp
Date Collected: 08/02/18 14:40
Date Received: 08/02/18 16:38

Lab Sample ID: 580-79307-10
Matrix: Solid
Percent Solids: 89.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B		1	281077	08/07/18 23:19	TL1	TAL SEA
Total/NA	Prep	3546	DL		280805	08/03/18 15:25	KMS	TAL SEA
Total/NA	Analysis	8081B	DL	10	281127	08/08/18 14:02	APR	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup

TestAmerica Job ID: 580-79307-2

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

TestAmerica Job ID: 580-79508-1
Client Project/Site: 2018 Webster Nursery Cleanup, Wa

For:
Landau & Associates, Inc.
2107 South C Street
Tacoma, Washington 98402

Attn: Sierra Mott

Authorized for release by:
8/24/2018 11:43:38 AM

Sheri Cruz, Project Manager I
(253)922-2310
sheri.cruz@testamericainc.com

Table of Contents

Job ID: 580-79508-1

Laboratory: TestAmerica Seattle

Narrative

Job Narrative
580-79508-1

Comments
No additional comments.

Receipt
The samples were received on 8/8/2018 4:45 PM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 7.6º C.

GC Semi VOA
Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-282294 recovered outside acceptance criteria, low biased, for 4,4'-DDT. A reporting limit (RL) standard was analyzed, and the target analyte was detected. Since the associated samples were non-detect for this analyte, the data have been reported.

Method(s) 8081B: The continuing calibration verification (CCV) associated with batch 580-282294 recovered above the upper control limit for Endrin. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: SW4-S-5.5 (580-79508-1), SW9-S-5.5 (580-79508-2) and (CCVIS 580-282294/8).

Method(s) 8081B: The continuing calibration verification (CCV) associated with 580-282294 recovered high and outside the control limits for 4,4'-DDE, Aldrin, alpha-BHC, beta-BHC, Dieldrin, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin aldehyde, Heptachlor epoxide and trans-Chlordane on the confirmation column only. Results are confirmed on both columns and reported from the passing column. The following samples are impacted: SW4-S-5.5 (580-79508-1), SW9-S-5.5 (580-79508-2), (CCVIS 580-282294/8) and (CCVL 580-282294/9).

Method(s) 8081B: The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for preparation batch 580-281575 and 580-281575 and analytical batch 580-282294 recovered outside control limits for the following analytes: Endrin. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

Method(s) 8081B: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 580-281575 and analytical batch 580-282294 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

General Chemistry
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup, Wa

TestAmerica Job ID: 580-79508-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
*	LCS or LCSD is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Sample Summary

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup, Wa

TestAmerica Job ID: 580-79508-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-79508-1	SW4-S-5.5	Solid	08/08/18 07:47	08/08/18 16:45
580-79508-2	SW9-S-5.5	Solid	08/08/18 07:48	08/08/18 16:45

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Seattle
5755 8th Street E.
Tacoma, WA 98424
Tel. 253-922-2310
Fax 253-922-5047
www.testamericainc.com

Loc: 580
79508

☐ Rush
☐ Short Hold

Chain of Custody Record

Client: Landau Associates, Inc.	Client Contact: Sierra Mott smott@landauinc.com	Date: 8/8/18	Chain of Custody Number: 36905
Address: 2107 S C St	Telephone Number (Area Code)/Fax Number: (253) 225-5743	Lab Number:	Page 1 of 1
City: Tacoma	State: WA	Zip Code: 98402	
Sampler: Annabel Warnell	Lab Contact: Sheri Cruz		
Project Name and Location (State): 2018 Webster Nursery Cleanup, WA	Billing Contact: Sierra Mott		
Contract/Purchase Order/Quote No.: 0774006.040.044			

Analysis (Attach list if more space is needed): Pesticides EPA 8081B

Special Instructions/ Conditions of Receipt

Sample I.D. and Location/Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Pesticides EPA 8081B	Special Instructions/ Conditions of Receipt
SW4-S-5.5	8/8/18	7:47				X	X						X	On ice
SW9-S-5.5	〃	7:48				X	X						X	

Therm. ID: 12 Cor: +1.4 ° Unc: 1.5 °
Cooler Dsc: Sm Blue
Packing: Bub
Cust. Seal: Yes ____ No X
Ice/Packs/Dry Ice/None
FedEx: ____
UPS: ____
Lab Cour: ____
Other: CD

580-79508 Chain of Custody

Cooler: ☑ Yes ☐ No Cooler Temp: ____

Possible Hazard Identification: ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☑ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required (business days): ☐ 24 Hours ☐ 48 Hours ☐ 5 Days ☐ 10 Days ☑ 15 Days (Standard) ☐ Other ____

QC Requirements (Specify)

1. Relinquished By Sign/Print: Annabel Warnell	Date: 8/8/18	Time: 16:45	1. Received By Sign/Print: Ken Hobbs	Date: 8-8-18	Time: 1645
2. Relinquished By Sign/Print:	Date:	Time:	2. Received By Sign/Print:	Date:	Time:
3. Relinquished By Sign/Print:	Date:	Time:	3. Received By Sign/Print:	Date:	Time:

Comments

DISTRIBUTION: WHITE – Stays with the Samples; CANARY – Returned to Client with Report; PINK – Field Copy

TAL-8274-580 (0210)

8/24/2018

Login Sample Receipt Checklist

Client: Landau & Associates, Inc.

Job Number: 580-79508-1

Login Number: 79508
List Number: 1
Creator: Gall, Brandon A

List Source: TestAmerica Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	Lab does not accept radioactive samples.
The cooler's custody seal, if present, is intact.	N/A	Not present
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	Received same day of collection; chilling process has begun.
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Method: 8081B - Organochlorine Pesticides (GC)

Client Sample ID: SW4-S-5.5
Date Collected: 08/08/18 07:47
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-1
Matrix: Solid
Percent Solids: 82.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
4,4'-DDE	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
4,4'-DDT	ND	F1	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Aldrin	ND	F1	3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
alpha-BHC	ND	F1	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
beta-BHC	ND	F1	6.0		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
cis-Chlordane	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
delta-BHC	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Dieldrin	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Endosulfan I	ND	F1	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Endosulfan II	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Endosulfan sulfate	ND	F1	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Endrin	ND	*	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Endrin aldehyde	ND		24		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Endrin ketone	ND	F1	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
gamma-BHC (Lindane)	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Heptachlor	ND	F1	3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Heptachlor epoxide	ND	F1	3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Methoxychlor	ND		12		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Toxaphene	ND		120		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
trans-Chlordane	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1
Technical Chlordane	ND		12		ug/Kg	☼	08/14/18 15:51	08/23/18 15:50	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*74*		*43 - 129*	*08/14/18 15:51*	*08/23/18 15:50*	*1*
Tetrachloro-m-xylene	*53*		*50 - 123*	*08/14/18 15:51*	*08/23/18 15:50*	*1*

Client Sample ID: SW9-S-5.5
Date Collected: 08/08/18 07:48
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-2
Matrix: Solid
Percent Solids: 82.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
4,4'-DDE	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
4,4'-DDT	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Aldrin	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
alpha-BHC	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
beta-BHC	ND		6.1		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
cis-Chlordane	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
delta-BHC	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Dieldrin	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Endosulfan I	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Endosulfan II	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Endosulfan sulfate	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Endrin	ND	*	2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Endrin aldehyde	ND		24		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Endrin ketone	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
gamma-BHC (Lindane)	ND		2.4		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Heptachlor	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Heptachlor epoxide	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Methoxychlor	ND		12		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Client Sample ID: SW9-S-5.5
Date Collected: 08/08/18 07:48
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-2
Matrix: Solid
Percent Solids: 82.0

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	ND		120		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
trans-Chlordane	ND		3.6		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1
Technical Chlordane	ND		12		ug/Kg	☼	08/14/18 15:51	08/23/18 16:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*72*		*43 - 129*	*08/14/18 15:51*	*08/23/18 16:48*	*1*
Tetrachloro-m-xylene	*54*		*50 - 123*	*08/14/18 15:51*	*08/23/18 16:48*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: MB 580-281575/1-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 281575

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,4'-DDD	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
4,4'-DDE	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
4,4'-DDT	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Aldrin	ND		3.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
alpha-BHC	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
beta-BHC	ND		5.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
cis-Chlordane	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
delta-BHC	ND		3.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Dieldrin	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Endosulfan I	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Endosulfan II	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Endosulfan sulfate	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Endrin	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Endrin aldehyde	ND		20		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Endrin ketone	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
gamma-BHC (Lindane)	ND		2.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Heptachlor	ND		3.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Heptachlor epoxide	ND		3.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Methoxychlor	ND		10		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Toxaphene	ND		100		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
trans-Chlordane	ND		3.0		ug/Kg		08/14/18 15:49	08/23/18 13:35	1
Technical Chlordane	ND		10		ug/Kg		08/14/18 15:49	08/23/18 13:35	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl	*113*		*43 - 129*	*08/14/18 15:49*	*08/23/18 13:35*	*1*
Tetrachloro-m-xylene	*84*		*50 - 123*	*08/14/18 15:49*	*08/23/18 13:35*	*1*

Lab Sample ID: LCS 580-281575/2-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	20.0	17.7		ug/Kg		89	61 - 122
4,4'-DDE	20.0	17.5		ug/Kg		88	53 - 124
4,4'-DDT	20.0	12.6		ug/Kg		63	57 - 137
Aldrin	20.0	15.2		ug/Kg		76	56 - 121
alpha-BHC	20.0	16.6		ug/Kg		83	62 - 120
beta-BHC	20.0	16.8		ug/Kg		84	62 - 120
cis-Chlordane	20.0	17.3		ug/Kg		86	62 - 120
delta-BHC	20.0	16.1		ug/Kg		81	53 - 124
Dieldrin	20.0	16.7		ug/Kg		83	63 - 121
Endosulfan I	20.0	15.9		ug/Kg		80	64 - 121
Endosulfan II	20.0	15.5		ug/Kg		77	37 - 139
Endosulfan sulfate	20.0	15.0		ug/Kg		75	63 - 120
Endrin	20.0	26.7	*	ug/Kg		134	70 - 127
Endrin aldehyde	20.0	12.9	J	ug/Kg		65	36 - 150
Endrin ketone	20.0	15.8		ug/Kg		79	56 - 120
gamma-BHC (Lindane)	20.0	17.1		ug/Kg		85	55 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 580-281575/2-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Heptachlor	20.0	17.3		ug/Kg		87	64 - 124
Heptachlor epoxide	20.0	17.0		ug/Kg		85	62 - 120
Methoxychlor	20.0	20.7		ug/Kg		103	61 - 130
trans-Chlordane	20.0	17.0		ug/Kg		85	60 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*109*		*43 - 129*
Tetrachloro-m-xylene	*80*		*50 - 123*

Lab Sample ID: LCS 580-281575/4-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Toxaphene	500	488		ug/Kg		98	57 - 126

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*102*		*43 - 129*
Tetrachloro-m-xylene	*79*		*50 - 123*

Lab Sample ID: LCS 580-281575/6-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Technical Chlordane	100	98.9		ug/Kg		99	20 - 132

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*98*		*43 - 129*
Tetrachloro-m-xylene	*73*		*50 - 123*

Lab Sample ID: LCSD 580-281575/3-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	20.0	18.3		ug/Kg		91	61 - 122	NaN	18
4,4'-DDE	20.0	17.7		ug/Kg		88	53 - 124	NaN	18
4,4'-DDT	20.0	12.8		ug/Kg		64	57 - 137	NaN	23
Aldrin	20.0	15.1		ug/Kg		76	56 - 121	NaN	18
alpha-BHC	20.0	17.0		ug/Kg		85	62 - 120	NaN	15
beta-BHC	20.0	16.6		ug/Kg		83	62 - 120	NaN	19
cis-Chlordane	20.0	17.2		ug/Kg		86	62 - 120	NaN	18
delta-BHC	20.0	16.4		ug/Kg		82	53 - 124	NaN	18
Dieldrin	20.0	17.3		ug/Kg		86	63 - 121	NaN	19
Endosulfan I	20.0	16.3		ug/Kg		82	64 - 121	NaN	20
Endosulfan II	20.0	15.8		ug/Kg		79	37 - 139	NaN	18

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 580-281575/3-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 281575

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Endosulfan sulfate			20.0	15.5		ug/Kg		77	63 - 120	NaN	19
Endrin			20.0	27.2	*	ug/Kg		136	70 - 127	NaN	20
Endrin aldehyde			20.0	14.5	J	ug/Kg		73	36 - 150	NaN	24
Endrin ketone			20.0	15.9		ug/Kg		80	56 - 120	NaN	18
gamma-BHC (Lindane)			20.0	17.3		ug/Kg		87	55 - 120	NaN	18
Heptachlor			20.0	17.3		ug/Kg		87	64 - 124	NaN	17
Heptachlor epoxide			20.0	17.3		ug/Kg		86	62 - 120	NaN	20
Methoxychlor			20.0	20.7		ug/Kg		103	61 - 130	NaN	20
trans-Chlordane			20.0	17.3		ug/Kg		87	60 - 120	NaN	19

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*109*		*43 - 129*
Tetrachloro-m-xylene	*79*		*50 - 123*

Lab Sample ID: LCSD 580-281575/5-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 281575

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Toxaphene			500	463		ug/Kg		93	57 - 126	NaN	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*102*		*43 - 129*
Tetrachloro-m-xylene	*74*		*50 - 123*

Lab Sample ID: LCSD 580-281575/7-A
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 281575

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Technical Chlordane			100	106		ug/Kg		106	20 - 132	7	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*104*		*43 - 129*
Tetrachloro-m-xylene	*74*		*50 - 123*

Lab Sample ID: 580-79508-1 MS
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: SW4-S-5.5
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
4,4'-DDD	ND		23.5	16.3		ug/Kg	☼	69	61 - 122
4,4'-DDE	ND		23.5	16.4		ug/Kg	☼	70	53 - 124
4,4'-DDT	ND	F1	23.5	12.3	F1	ug/Kg	☼	52	57 - 137
Aldrin	ND	F1	23.5	14.4		ug/Kg	☼	61	56 - 121
alpha-BHC	ND	F1	23.5	15.2		ug/Kg	☼	65	62 - 120
beta-BHC	ND	F1	23.5	14.8		ug/Kg	☼	63	62 - 120

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 580-79508-1 MS
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: SW4-S-5.5
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-Chlordane	ND		23.5	16.4		ug/Kg	☼	70	62 - 120
delta-BHC	ND		23.5	15.1		ug/Kg	☼	64	53 - 124
Dieldrin	ND		23.5	15.8		ug/Kg	☼	67	63 - 121
Endosulfan I	ND	F1	23.5	15.1		ug/Kg	☼	64	64 - 121
Endosulfan II	ND		23.5	14.2		ug/Kg	☼	60	37 - 139
Endosulfan sulfate	ND	F1	23.5	13.7	F1	ug/Kg	☼	58	63 - 120
Endrin	ND	*	23.5	24.5		ug/Kg	☼	104	70 - 127
Endrin aldehyde	ND		23.5	ND		ug/Kg	☼	49	36 - 150
Endrin ketone	ND	F1	23.5	14.4		ug/Kg	☼	61	56 - 120
gamma-BHC (Lindane)	ND		23.5	15.6		ug/Kg	☼	67	55 - 120
Heptachlor	ND	F1	23.5	14.4	F1	ug/Kg	☼	61	64 - 124
Heptachlor epoxide	ND	F1	23.5	15.8		ug/Kg	☼	67	62 - 120
Methoxychlor	ND		23.5	17.8		ug/Kg	☼	76	61 - 130
trans-Chlordane	ND		23.5	16.3		ug/Kg	☼	69	60 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCB Decachlorobiphenyl	*84*		*43 - 129*
Tetrachloro-m-xylene	*66*		*50 - 123*

Lab Sample ID: 580-79508-1 MSD
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: SW4-S-5.5
Prep Type: Total/NA
Prep Batch: 281575

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
4,4'-DDD	ND		23.8	14.6		ug/Kg	☼	61	61 - 122	11	18
4,4'-DDE	ND		23.8	16.2		ug/Kg	☼	68	53 - 124	1	18
4,4'-DDT	ND	F1	23.8	11.0	F1	ug/Kg	☼	46	57 - 137	11	23
Aldrin	ND	F1	23.8	13.1	F1	ug/Kg	☼	55	56 - 121	9	18
alpha-BHC	ND	F1	23.8	13.1	F1	ug/Kg	☼	55	62 - 120	15	15
beta-BHC	ND	F1	23.8	13.0	F1	ug/Kg	☼	55	62 - 120	13	19
cis-Chlordane	ND		23.8	15.3		ug/Kg	☼	64	62 - 120	7	18
delta-BHC	ND		23.8	12.9		ug/Kg	☼	54	53 - 124	16	18
Dieldrin	ND		23.8	15.2		ug/Kg	☼	64	63 - 121	4	19
Endosulfan I	ND	F1	23.8	14.5	F1	ug/Kg	☼	61	64 - 121	4	20
Endosulfan II	ND		23.8	12.7		ug/Kg	☼	53	37 - 139	11	18
Endosulfan sulfate	ND	F1	23.8	12.2	F1	ug/Kg	☼	51	63 - 120	12	19
Endrin	ND	*	23.8	22.0		ug/Kg	☼	93	70 - 127	10	20
Endrin aldehyde	ND		23.8	ND		ug/Kg	☼	44	36 - 150	9	24
Endrin ketone	ND	F1	23.8	13.0	F1	ug/Kg	☼	54	56 - 120	11	18
gamma-BHC (Lindane)	ND		23.8	13.6		ug/Kg	☼	57	55 - 120	14	18
Heptachlor	ND	F1	23.8	13.1	F1	ug/Kg	☼	55	64 - 124	9	17
Heptachlor epoxide	ND	F1	23.8	13.8	F1	ug/Kg	☼	58	62 - 120	14	20
Methoxychlor	ND		23.8	16.6		ug/Kg	☼	70	61 - 130	7	20
trans-Chlordane	ND		23.8	14.6		ug/Kg	☼	61	60 - 120	11	19

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
DCB Decachlorobiphenyl	*77*		*43 - 129*

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: 580-79508-1 MSD
Matrix: Solid
Analysis Batch: 282294

Client Sample ID: SW4-S-5.5
Prep Type: Total/NA
Prep Batch: 281575

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Tetrachloro-m-xylene	*58*		*50 - 123*

Lab Chronicle

Client: Landau & Associates, Inc.
Project/Site: 2018 Webster Nursery Cleanup, Wa

TestAmerica Job ID: 580-79508-1

Client Sample ID: SW4-S-5.5
Date Collected: 08/08/18 07:47
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-1
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	281504	08/14/18 10:10	BAH	TAL SEA

Client Sample ID: SW4-S-5.5
Date Collected: 08/08/18 07:47
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-1
Matrix: Solid
Percent Solids: 82.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			281575	08/14/18 15:51	BAH	TAL SEA
Total/NA	Analysis	8081B		1	282294	08/23/18 15:50	TL1	TAL SEA

Client Sample ID: SW9-S-5.5
Date Collected: 08/08/18 07:48
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	281504	08/14/18 10:10	BAH	TAL SEA

Client Sample ID: SW9-S-5.5
Date Collected: 08/08/18 07:48
Date Received: 08/08/18 16:45

Lab Sample ID: 580-79508-2
Matrix: Solid
Percent Solids: 82.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			281575	08/14/18 15:51	BAH	TAL SEA
Total/NA	Analysis	8081B		1	282294	08/23/18 16:48	TL1	TAL SEA

Laboratory References:

TAL SEA = TestAmerica Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: Landau & Associates, Inc. TestAmerica Job ID: 580-79508-1
Project/Site: 2018 Webster Nursery Cleanup, Wa

Laboratory: TestAmerica Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Washington	State Program	10	C553	02-17-19

The following analytes are included in this report, but accreditation/certification is not offered by the governing authority:

Analysis Method	Prep Method	Matrix	Analyte
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

APPENDIX F

Fill Laboratory Analytical Reports and Specifications

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Client:	Black Lake Resources	**Date:**	April 10, 2017
Address:	2840 Black Lake Blvd. SW	**Project:**	Q.C. - Black Lake Resources
	Tumwater, WA, 98512	**Project #:**	16S158-02
Attn:		**Sample #:**	S17-146

As requested MTC, Inc. has performed the following test(s) on the sample referenced above. The testing was performed in accordance with current applicable AASHTO or ASTM standards as indicated below. The results obtained in our laboratory were as follows below or on the attached pages:

	Test(s) Performed:	Test Results		Test(s) Performed:	Test Results
X	Sieve Analysis	Meets Spec		Sulfate Soundness	
	Proctor			Bulk Density & Voids	
X	Sand Equivalent	83		WSDOT Degradation	
	Fracture Count				
	Moisture Content				
	Specific Gravity, Coarse				
	Specific Gravity, Fine				
	Hydrometer Analysis				
	Atterberg Limits				

If you have any questions concerning the test results, the procedures used, or if we can be of any further assistance please call on us at the number below.

Respectfully Submitted,
Frank J Pooler
WABO Supervising Laboratory Technician

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Sieve Report

Project: Q.C. - Black Lake Resources
Project #: 16S158-02
Client: Black Lake Resources
Source: Little Rock Pit
Sample#: S17-146

Date Received: 5-Apr-17
Sampled By: SBO
Date Tested: 7-Apr-17
Tested By: JE

ASTM D-2487 Unified Soils Classification System
SP, Poorly graded Sand with Gravel
Sample Color:
Brown
Pea Gravel

ACCREDITED
Certificate #: 1366.01, 1366.02 & 1366.04

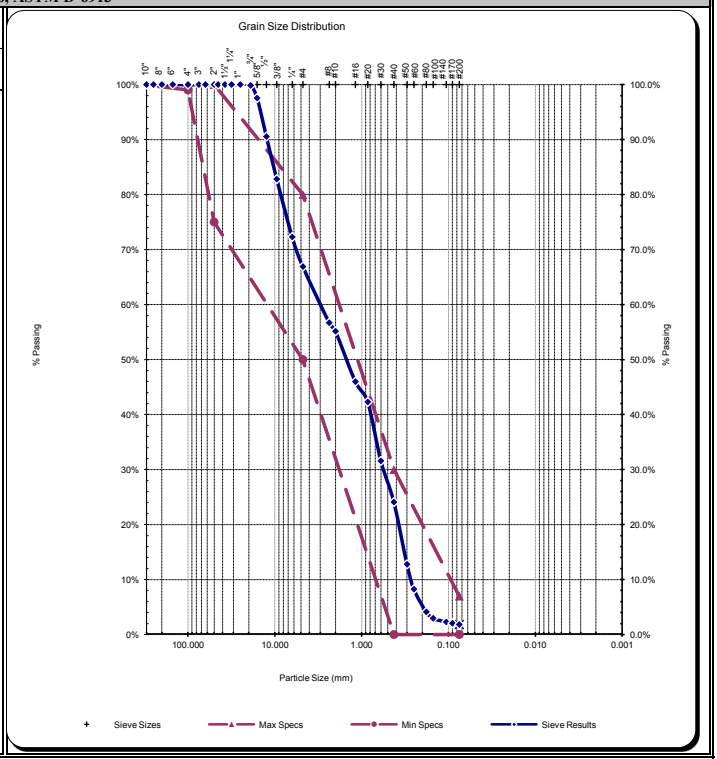
ASTM D-2216, ASTM D-2419, ASTM D-4318, ASTM D-5821

Specifications
2016 WSDOT 9-03.14(1) Gravel Borrow
Sample Meets Specs ? Yes

$D_{(5)}$ =	0.195 mm	% Gravel =	33.1%	Coeff. of Curvature, C_C =	0.38
$D_{(10)}$ =	0.269 mm	% Sand =	65.1%	Coeff. of Uniformity, C_U =	11.64
$D_{(15)}$ =	0.325 mm	% Silt & Clay =	1.8%	Fineness Modulus =	4.00
$D_{(30)}$ =	0.563 mm	Liquid Limit =	n/a	Plastic Limit =	n/a
$D_{(50)}$ =	1.539 mm	Plasticity Index =	n/a	Moisture %, as sampled =	2.3%
$D_{(60)}$ =	3.136 mm	Sand Equivalent =	83	Req'd Sand Equivalent =	50
$D_{(90)}$ =	12.287 mm	Fracture %, 1 Face =	n/a	Req'd Fracture %, 1 Face =	
Dust Ratio =	4/53	Fracture %, 2+ Faces =	n/a	Req'd Fracture %, 2+ Faces =	

ASTM C-136, ASTM D-6913

Sieve Size US	Sieve Size Metric	Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
12.00"	300.00		100%		
10.00"	250.00		100%		
8.00"	200.00		100%		
6.00"	150.00		100%		
4.00"	100.00	100%	100%	100.0%	99.0%
3.00"	75.00		100%		
2.50"	63.00		100%		
2.00"	50.00	100%	100%	100.0%	75.0%
1.75"	45.00		100%		
1.50"	37.50		100%		
1.25"	31.50		100%		
1.00"	25.00	100%	100%		
3/4"	19.00	100%	100%		
5/8"	16.00	98%	98%		
1/2"	12.50	91%	91%		
3/8"	9.50	83%	83%		
1/4"	6.30	72%	72%		
#4	4.75	67%	67%	80.0%	50.0%
#8	2.36		57%		
#10	2.00	55%	55%		
#16	1.18		46%		
#20	0.850	42%	42%		
#30	0.600		32%		
#40	0.425	24%	24%	30.0%	0.0%
#50	0.300		13%		
#60	0.250	8%	8%		
#80	0.180	4%	4%		
#100	0.150	3%	3%		
#140	0.106		2%		
#170	0.090		2%		
#200	0.075	1.8%	1.8%	7.0%	0.0%



Comments: _____

Reviewed by: _____

Materials Testing & Consulting, Inc.

Geotechnical Engineering • Special Inspection • Materials Testing • Environmental Consulting

Sand Equivalent Report

Project:	Q.C. - Black Lake Resources	**Date Received:**	5-Apr-17
Project #:	16S158-02	**Sampled By:**	SBO
Client :	Black Lake Resources	**Date Tested:**	7-Apr-17
Source:	Little Rock Pit	**Tested By:**	JE
Sample#:	S17-146		

ASTM D 2487 Soils Classification
SP, Poorly graded Sand with Gravel
Sample Color
Brown

Sand Equivalent - ASTM D-2419, AASHTO T-176

ACCREDITED
Certificate #: 1366.01, 1366.02 & 1366.04

Temperature of Solution: 72

Sand Equivalent = (Sand Reading/Clay Reading) x 100

	#1	#2	#3
Clay Reading:	4.1	4.3	n/a
Sand Reading:	3.5	3.4	
Time:	20 mins	20 mins	20 mins
Sand Equivalent:	86	80	n/a

Average Sand Equivalent:	83.0
Adjusted Sand Equivalent:	83
Required Sand Equivalent:	50

Comments:

Reviewed by:

Corporate ~ 777 Chrysler Drive • Burlington, WA 98233 • Phone (360) 755-1990 • Fax (360) 755-1980

Regional Offices: Olympia ~ 360.534.9777 Bellingham ~ 360.647.6111 Silverdale ~ 360.698.6787 Tukwila ~ 206.241.1974

Visit our website: www.mtc-inc.net

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Monday, July 30, 2018

Brett MacDonald
3 Kings Environmental
1311 SE Grace Ave
Battle Ground, WA 98604

RE: A8G0663 - DNR - Webster - 218076

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A8G0663, which was received by the laboratory on 7/25/2018 at 1:35:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of final reporting, unless prior arrangements have been made.

DRAFT REPORT

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

3 Kings Environmental	Project: **DNR - Webster**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Miles-GB1	A8G0663-01	Solid	07/25/18 11:05	07/25/18 13:35
Miles-GB2	A8G0663-02	Solid	07/25/18 11:10	07/25/18 13:35
Miles-GB3	A8G0663-03	Solid	07/25/18 11:15	07/25/18 13:35

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ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-GB1 (A8G0663-01)				**Matrix: Solid**			**Batch: 8071127**	
Diesel	ND	---	25.0	mg/kg	1	07/28/18	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg	1	07/28/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 98 %*		*Limits: 50-150 %*	*1*	*07/28/18*	*NWTPH-Dx*	
Miles-GB2 (A8G0663-02)				**Matrix: Solid**			**Batch: 8071127**	
Diesel	ND	---	25.0	mg/kg	1	07/28/18	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg	1	07/28/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 103 %*		*Limits: 50-150 %*	*1*	*07/28/18*	*NWTPH-Dx*	
Miles-GB3 (A8G0663-03)				**Matrix: Solid**			**Batch: 8071127**	
Diesel	ND	---	25.0	mg/kg	1	07/28/18	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg	1	07/28/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 106 %*		*Limits: 50-150 %*	*1*	*07/28/18*	*NWTPH-Dx*	

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ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-GB1 (A8G0663-01)				**Matrix: Solid**			**Batch: 8071089**	**V-15**
Gasoline Range Organics	ND	---	4.68	mg/kg dry	50	07/27/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*98 %*	*Limits: 50-150 %*	*1*	*07/27/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*95 %*	*50-150 %*	*1*	*07/27/18*	*NWTPH-Gx (MS)*	
Miles-GB2 (A8G0663-02RE1)				**Matrix: Solid**			**Batch: 8071102**	**V-15**
Gasoline Range Organics	ND	---	4.43	mg/kg dry	50	07/27/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*100 %*	*Limits: 50-150 %*	*1*	*07/27/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*96 %*	*50-150 %*	*1*	*07/27/18*	*NWTPH-Gx (MS)*	
Miles-GB3 (A8G0663-03)				**Matrix: Solid**			**Batch: 8071089**	**V-15**
Gasoline Range Organics	ND	---	4.64	mg/kg dry	50	07/27/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*98 %*	*Limits: 50-150 %*	*1*	*07/27/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*95 %*	*50-150 %*	*1*	*07/27/18*	*NWTPH-Gx (MS)*	

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ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-GB1 (A8G0663-01)				**Matrix: Solid**			**Batch: 8071044**	
Aldrin	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
alpha-BHC	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
beta-BHC	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
delta-BHC	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
gamma-BHC (Lindane)	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
cis-Chlordane	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
trans-Chlordane	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDD	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDE	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDT	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Dieldrin	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan I	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan II	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan sulfate	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Endrin	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Endrin Aldehyde	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Endrin ketone	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Heptachlor	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Heptachlor epoxide	ND	---	0.979	ug/kg	1	07/27/18	EPA 8081B	
Methoxychlor	ND	---	2.94	ug/kg	1	07/27/18	EPA 8081B	
Chlordane (Technical)	ND	---	29.4	ug/kg	1	07/27/18	EPA 8081B	
Toxaphene (Total)	ND	---	29.4	ug/kg	1	07/27/18	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)		*Recovery: 92 %*		*Limits: 42-129 %*	*1*	*07/27/18*	*EPA 8081B*	
Decachlorobiphenyl (Surr)		*106 %*		*65-151 %*	*1*	*07/27/18*	*EPA 8081B*	
Miles-GB2 (A8G0663-02)				**Matrix: Solid**			**Batch: 8071044**	
Aldrin	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
alpha-BHC	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
beta-BHC	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
delta-BHC	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
gamma-BHC (Lindane)	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
cis-Chlordane	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
trans-Chlordane	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDD	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDE	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDT	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Dieldrin	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan I	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	

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ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-GB2 (A8G0663-02)				**Matrix: Solid**			**Batch: 8071044**	
Endosulfan II	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan sulfate	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Endrin	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Endrin Aldehyde	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Endrin ketone	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Heptachlor	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Heptachlor epoxide	ND	---	0.992	ug/kg	1	07/27/18	EPA 8081B	
Methoxychlor	ND	---	2.98	ug/kg	1	07/27/18	EPA 8081B	
Chlordane (Technical)	ND	---	29.8	ug/kg	1	07/27/18	EPA 8081B	
Toxaphene (Total)	ND	---	29.8	ug/kg	1	07/27/18	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)		*Recovery: 91 %*		*Limits: 42-129 %*	*1*	*07/27/18*	*EPA 8081B*	
Decachlorobiphenyl (Surr)		*104 %*		*65-151 %*	*1*	*07/27/18*	*EPA 8081B*	
Miles-GB3 (A8G0663-03)				**Matrix: Solid**			**Batch: 8071044**	
Aldrin	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
alpha-BHC	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
beta-BHC	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
delta-BHC	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
gamma-BHC (Lindane)	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
cis-Chlordane	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
trans-Chlordane	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDD	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDE	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
4,4'-DDT	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Dieldrin	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan I	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan II	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Endosulfan sulfate	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Endrin	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Endrin Aldehyde	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Endrin ketone	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Heptachlor	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Heptachlor epoxide	ND	---	0.978	ug/kg	1	07/27/18	EPA 8081B	
Methoxychlor	ND	---	2.94	ug/kg	1	07/27/18	EPA 8081B	
Chlordane (Technical)	ND	---	29.4	ug/kg	1	07/27/18	EPA 8081B	
Toxaphene (Total)	ND	---	29.4	ug/kg	1	07/27/18	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)		*Recovery: 89 %*		*Limits: 42-129 %*	*1*	*07/27/18*	*EPA 8081B*	
Decachlorobiphenyl (Surr)		*106 %*		*65-151 %*	*1*	*07/27/18*	*EPA 8081B*	

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ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes

Highlighted results have not undergone full secondary data review at the time of reporting.
Results are subject to change upon final review and reporting.

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ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-GB1 (A8G0663-01RE1)				**Matrix: Solid**				
Batch: 8071055								
Arsenic	**1.41**	---	0.998	mg/kg	10	07/27/18	EPA 6020A	
Miles-GB2 (A8G0663-02RE1)				**Matrix: Solid**				
Batch: 8071055								
Arsenic	**1.51**	---	0.998	mg/kg	10	07/27/18	EPA 6020A	
Miles-GB3 (A8G0663-03RE1)				**Matrix: Solid**				
Batch: 8071055								
Arsenic	**1.62**	---	0.971	mg/kg	10	07/27/18	EPA 6020A	

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ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-GB1 (A8G0663-01)				**Matrix: Solid**			**Batch: 8071104**	
% Solids	**97.1**	---	1.00	% by Weight	1	07/30/18	EPA 8000C	
Miles-GB2 (A8G0663-02)				**Matrix: Solid**			**Batch: 8071104**	
% Solids	**99.4**	---	1.00	% by Weight	1	07/30/18	EPA 8000C	
Miles-GB3 (A8G0663-03)				**Matrix: Solid**			**Batch: 8071104**	
% Solids	**99.7**	---	1.00	% by Weight	1	07/30/18	EPA 8000C	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071127 - EPA 3546 (Fuels)							**Solid**					
Blank (8071127-BLK1)		Prepared: 07/27/18 13:46		Analyzed: 07/28/18 00:30								
NWTPH-Dx												
Diesel	ND	---	18.2	mg/kg	1	---	---	---	---	---	---	
Oil	ND	---	36.4	mg/kg	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 106 %*		*Limits: 50-150 %*			*Dilution: 1x*					
LCS (8071127-BS1)		Prepared: 07/27/18 13:46		Analyzed: 07/28/18 00:50								
NWTPH-Dx												
Diesel	124	---	20.0	mg/kg	1	125	---	99	70-130%	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 102 %*		*Limits: 50-150 %*			*Dilution: 1x*					
Duplicate (8071127-DUP1)		Prepared: 07/27/18 13:46		Analyzed: 07/28/18 01:31								
QC Source Sample: Miles-GB1 (A8G0663-01)												
NWTPH-Dx												
Diesel	ND	---	19.0	mg/kg	1	---	ND	---	---	---	30%	
Oil	ND	---	38.0	mg/kg	1	---	ND	---	---	---	30%	
Surr: o-Terphenyl (Surr)		*Recovery: 102 %*		*Limits: 50-150 %*			*Dilution: 1x*					

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071089 - EPA 5035A							Soil					
Blank (8071089-BLK1)		Prepared: 07/26/18 18:00		Analyzed: 07/26/18 20:37								
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 100 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*95 %*		*50-150 %*		*"*					
LCS (8071089-BS2)		Prepared: 07/26/18 18:00		Analyzed: 07/26/18 20:08								
NWTPH-Gx (MS)												
Gasoline Range Organics	27.8	---	5.00	mg/kg wet	50	25.0	---	111	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 99 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*95 %*		*50-150 %*		*"*					

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071102 - EPA 5035A							Soil					
Blank (8071102-BLK1)		Prepared: 07/27/18 09:00		Analyzed: 07/27/18 11:37								
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 100 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*95 %*		*50-150 %*			*"*				
LCS (8071102-BS2)		Prepared: 07/27/18 09:00		Analyzed: 07/27/18 11:10								
NWTPH-Gx (MS)												
Gasoline Range Organics	26.0	---	5.00	mg/kg wet	50	25.0	---	104	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery: 98 %*		*Limits: 50-150 %*			*Dilution: 1x*					
1,4-Difluorobenzene (Sur)			*98 %*		*50-150 %*			*"*				

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QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071044 - EPA 3546							**Solid**					
Blank (8071044-BLK1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 10:20								
EPA 8081B												
Aldrin	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
alpha-BHC	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
beta-BHC	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
delta-BHC	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
gamma-BHC (Lindane)	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
cis-Chlordane	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
trans-Chlordane	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
4,4'-DDD	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
4,4'-DDE	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
4,4'-DDT	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Dieldrin	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Endosulfan I	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Endosulfan II	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Endosulfan sulfate	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Endrin	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Endrin Aldehyde	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Endrin ketone	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Heptachlor	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Heptachlor epoxide	ND	---	0.909	ug/kg	1	---	---	---	---	---	---	
Methoxychlor	ND	---	2.73	ug/kg	1	---	---	---	---	---	---	
Chlordane (Technical)	ND	---	27.3	ug/kg	1	---	---	---	---	---	---	
Toxaphene (Total)	ND	---	27.3	ug/kg	1	---	---	---	---	---	---	
Surr: 2,4,5,6-TCMX (Surr)		*Recovery: 96 %*		*Limits: 42-129 %*			*Dilution: 1x*					
Decachlorobiphenyl (Surr)			*105 %*		*65-151 %*			*"*				
LCS (8071044-BS1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 10:38								
EPA 8081B												
Aldrin	45.8	---	1.00	ug/kg	1	50.0	---	92	45-136%	---	---	
alpha-BHC	47.6	---	1.00	ug/kg	1	50.0	---	95	45-137%	---	---	
beta-BHC	51.6	---	1.00	ug/kg	1	50.0	---	103	50-136%	---	---	Q-41
delta-BHC	49.9	---	1.00	ug/kg	1	50.0	---	100	47-139%	---	---	
gamma-BHC (Lindane)	49.4	---	1.00	ug/kg	1	50.0	---	99	49-135%	---	---	
cis-Chlordane	49.7	---	1.00	ug/kg	1	50.0	---	99	54-133%	---	---	

DRAFT REPORT

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Apex Laboratories, LLC

12232 S.W. Garden Place
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503-718-2323
EPA ID: OR01039

3 Kings Environmental	Project: **DNR - Webster**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071044 - EPA 3546							**Solid**					
LCS (8071044-BS1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 10:38								
trans-Chlordane	48.9	---	1.00	ug/kg	1	50.0	---	98	53-135%	---	---	
4,4'-DDD	50.5	---	1.00	ug/kg	1	50.0	---	101	56-139%	---	---	
4,4'-DDE	50.5	---	1.00	ug/kg	1	50.0	---	101	56-134%	---	---	
4,4'-DDT	56.5	---	1.00	ug/kg	1	50.0	---	113	50-141%	---	---	
Dieldrin	50.3	---	1.00	ug/kg	1	50.0	---	101	56-136%	---	---	
Endosulfan I	48.6	---	1.00	ug/kg	1	50.0	---	97	52-132%	---	---	
Endosulfan II	50.2	---	1.00	ug/kg	1	50.0	---	100	53-134%	---	---	
Endosulfan sulfate	48.9	---	1.00	ug/kg	1	50.0	---	98	55-136%	---	---	
Endrin	53.8	---	1.00	ug/kg	1	50.0	---	108	56-140%	---	---	Q-41
Endrin Aldehyde	44.5	---	1.00	ug/kg	1	50.0	---	89	35-137%	---	---	
Endrin ketone	51.7	---	1.00	ug/kg	1	50.0	---	103	55-136%	---	---	Q-41
Heptachlor	51.3	---	1.00	ug/kg	1	50.0	---	103	47-136%	---	---	Q-41
Heptachlor epoxide	48.9	---	1.00	ug/kg	1	50.0	---	98	52-136%	---	---	
Methoxychlor	58.5	---	3.00	ug/kg	1	50.0	---	117	52-143%	---	---	
Surr: 2,4,5,6-TCMX (Surr)			*Recovery: 90 %*		*Limits: 42-129 %*				*Dilution: 1x*			
Decachlorobiphenyl (Surr)			*104 %*		*65-151 %*				*"*			
Duplicate (8071044-DUP1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 11:13								
QC Source Sample: Miles-GB1 (A8G0663-01)												
EPA 8081B												
Aldrin	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
alpha-BHC	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
beta-BHC	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
delta-BHC	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
gamma-BHC (Lindane)	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
cis-Chlordane	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
trans-Chlordane	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
4,4'-DDD	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
4,4'-DDE	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
4,4'-DDT	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Dieldrin	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Endosulfan I	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Endosulfan II	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Endosulfan sulfate	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	

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3 Kings Environmental	Project: **DNR - Webster**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071044 - EPA 3546							**Solid**					
Duplicate (8071044-DUP1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 11:13								
QC Source Sample: Miles-GB1 (A8G0663-01)												
Endrin	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Endrin Aldehyde	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Endrin ketone	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Heptachlor	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Heptachlor epoxide	ND	---	0.981	ug/kg	1	---	ND	---	---	---	30%	
Methoxychlor	ND	---	2.94	ug/kg	1	---	ND	---	---	---	30%	
Chlordane (Technical)	ND	---	29.4	ug/kg	1	---	ND	---	---	---	30%	
Toxaphene (Total)	ND	---	29.4	ug/kg	1	---	ND	---	---	---	30%	
Surr: 2,4,5,6-TCMX (Surr)		*Recovery: 84 %*		*Limits: 42-129 %*			*Dilution: 1x*					
Decachlorobiphenyl (Surr)		*95 %*		*65-151 %*			*"*					
Matrix Spike (8071044-MS1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 12:08								
QC Source Sample: Miles-GB3 (A8G0663-03)												
EPA 8081B												
Aldrin	44.0	---	0.975	ug/kg	1	48.7	ND	90	45-136%	---	---	
alpha-BHC	47.8	---	0.975	ug/kg	1	48.7	ND	98	45-137%	---	---	
beta-BHC	52.4	---	0.975	ug/kg	1	48.7	ND	108	50-136%	---	---	Q-41
delta-BHC	50.7	---	0.975	ug/kg	1	48.7	ND	104	47-139%	---	---	
gamma-BHC (Lindane)	49.4	---	0.975	ug/kg	1	48.7	ND	101	49-135%	---	---	
cis-Chlordane	50.5	---	0.975	ug/kg	1	48.7	ND	104	54-133%	---	---	
trans-Chlordane	51.4	---	0.975	ug/kg	1	48.7	ND	106	53-135%	---	---	
4,4'-DDD	51.8	---	0.975	ug/kg	1	48.7	ND	106	56-139%	---	---	
4,4'-DDE	50.6	---	0.975	ug/kg	1	48.7	ND	104	56-134%	---	---	
4,4'-DDT	58.3	---	0.975	ug/kg	1	48.7	ND	120	50-141%	---	---	
Dieldrin	51.0	---	0.975	ug/kg	1	48.7	ND	105	56-136%	---	---	
Endosulfan I	50.2	---	0.975	ug/kg	1	48.7	ND	103	52-132%	---	---	
Endosulfan II	53.1	---	0.975	ug/kg	1	48.7	ND	109	53-134%	---	---	
Endosulfan sulfate	52.2	---	0.975	ug/kg	1	48.7	ND	107	55-136%	---	---	
Endrin	55.2	---	0.975	ug/kg	1	48.7	ND	113	56-140%	---	---	Q-41
Endrin Aldehyde	45.6	---	0.975	ug/kg	1	48.7	ND	94	35-137%	---	---	
Endrin ketone	52.7	---	0.975	ug/kg	1	48.7	ND	108	55-136%	---	---	Q-41
Heptachlor	52.6	---	0.975	ug/kg	1	48.7	ND	108	47-136%	---	---	Q-41
Heptachlor epoxide	50.3	---	0.975	ug/kg	1	48.7	ND	103	52-136%	---	---	

DRAFT REPORT

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QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071044 - EPA 3546							**Solid**					
Matrix Spike (8071044-MS1)		Prepared: 07/26/18 07:17		Analyzed: 07/27/18 12:08								
QC Source Sample: Miles-GB3 (A8G0663-03)												
Methoxychlor	58.5	---	2.92	ug/kg	1	48.7	ND	120	52-143%	---	---	
Surr: 2,4,5,6-TCMX (Surr)		*Recovery: 91 %*		*Limits: 42-129 %*			*Dilution: 1x*					
Decachlorobiphenyl (Surr)			*107 %*		*65-151 %*		*"*					

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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071055 - EPA 3051A							**Solid**					
Blank (8071055-BLK1)		Prepared: 07/26/18 09:35		Analyzed: 07/26/18 22:25								
EPA 6020A												
Arsenic	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
LCS (8071055-BS1)		Prepared: 07/26/18 09:35		Analyzed: 07/26/18 22:29								
EPA 6020A												
Arsenic	46.9	---	1.00	mg/kg	10	50.0	---	94	80-120%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071104 - Total Solids (Dry Weight)							**Soil**					

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

DRAFT REPORT

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SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071127							
A8G0663-01	Solid	NWTPH-Dx	07/25/18 11:05	07/27/18 13:46	10.52g/5mL	10g/5mL	0.95
A8G0663-02	Solid	NWTPH-Dx	07/25/18 11:10	07/27/18 13:46	10.43g/5mL	10g/5mL	0.96
A8G0663-03	Solid	NWTPH-Dx	07/25/18 11:15	07/27/18 13:46	10.34g/5mL	10g/5mL	0.97

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071089							
A8G0663-01	Solid	NWTPH-Gx (MS)	07/25/18 11:05	07/25/18 15:34	5.69g/5mL	5g/5mL	0.88
A8G0663-03	Solid	NWTPH-Gx (MS)	07/25/18 11:15	07/25/18 15:34	5.42g/5mL	5g/5mL	0.92
Batch: 8071102							
A8G0663-02RE1	Solid	NWTPH-Gx (MS)	07/25/18 11:10	07/25/18 15:34	5.72g/5mL	5g/5mL	0.87

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071044							
A8G0663-01	Solid	EPA 8081B	07/25/18 11:05	07/26/18 07:17	10.21g/5mL	10g/5mL	0.98
A8G0663-02	Solid	EPA 8081B	07/25/18 11:10	07/26/18 07:17	10.08g/5mL	10g/5mL	0.99
A8G0663-03	Solid	EPA 8081B	07/25/18 11:15	07/26/18 07:17	10.22g/5mL	10g/5mL	0.98

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071055							
A8G0663-01RE1	Solid	EPA 6020A	07/25/18 11:05	07/26/18 09:35	0.501g/50mL	0.5g/50mL	1.00
A8G0663-02RE1	Solid	EPA 6020A	07/25/18 11:10	07/26/18 09:35	0.501g/50mL	0.5g/50mL	1.00
A8G0663-03RE1	Solid	EPA 6020A	07/25/18 11:15	07/26/18 09:35	0.515g/50mL	0.5g/50mL	0.97

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor

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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071104							
A8G0663-01	Solid	EPA 8000C	07/25/18 11:05	07/27/18 18:49			NA
A8G0663-02	Solid	EPA 8000C	07/25/18 11:10	07/27/18 18:49			NA
A8G0663-03	Solid	EPA 8000C	07/25/18 11:15	07/27/18 18:49			NA

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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

Q-41	Estimated Results. Recovery of Continuing Calibration Verification sample above upper control limit for this analyte. Results are likely biased high.
V-15	Sample aliquot was subsampled from the sample container. The subsampled aliquot was preserved in the laboratory within 48 hours of sampling.

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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

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EPA ID: OR01039

3 Kings Environmental	Project: **DNR - Webster**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

Apex Laboratories, LLC

12232 S.W. Garden Place
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503-718-2323
EPA ID: OR01039

3 Kings Environmental	Project: **DNR - Webster**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

LABORATORY ACCREDITATION INFORMATION

TNI Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

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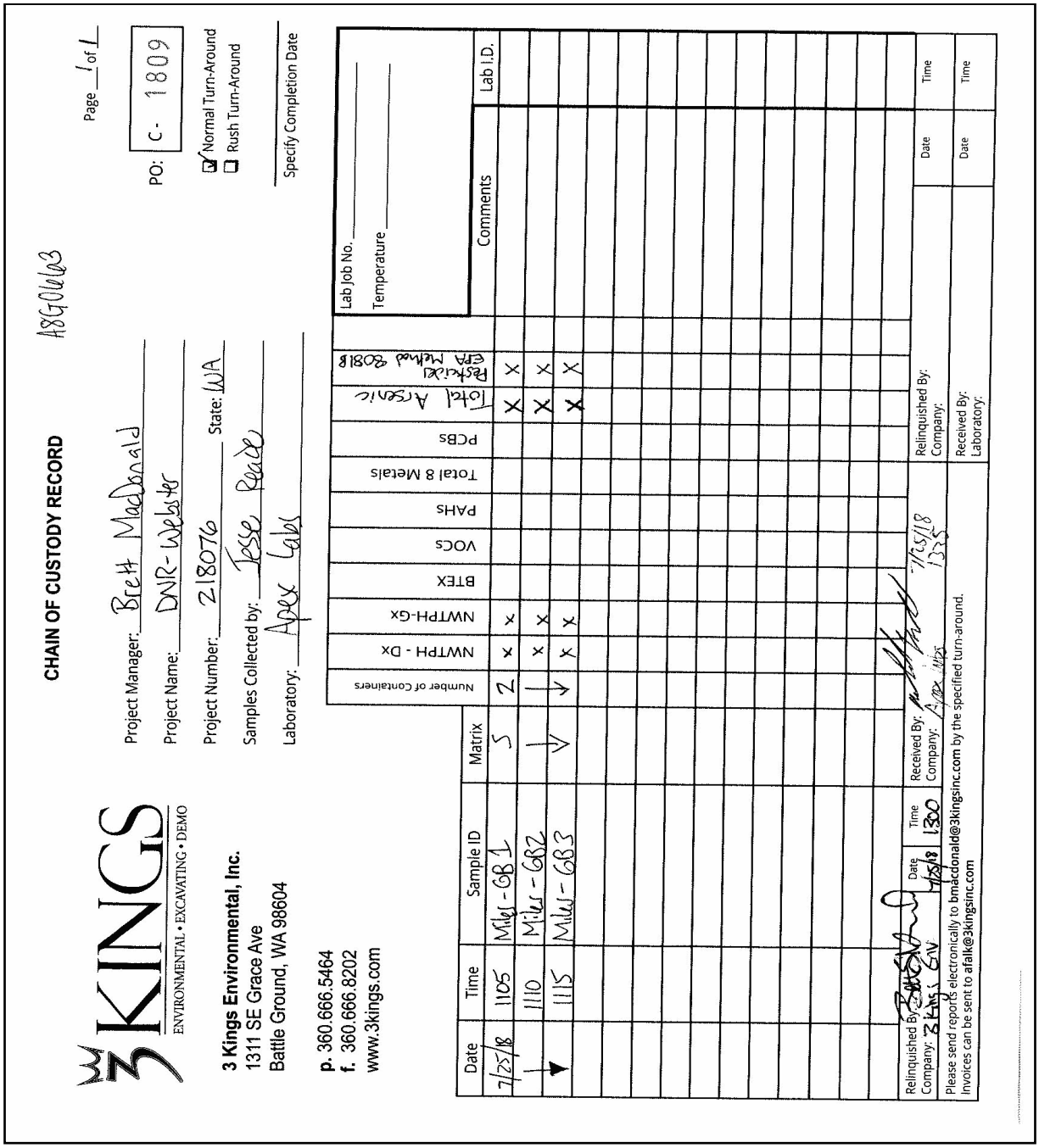

CHAIN OF CUSTODY RECORD A8G0663

Page 1 of 1

PO: C-1809

☑ Normal Turn-Around
☐ Rush Turn-Around

Specify Completion Date

Project Manager: Brett Macdonald
Project Name: DNR-Webster
Project Number: 218076 State: WA
Samples Collected by: Jesse Reader
Laboratory: Apex Labs

Lab Job No.
Temperature

Date	Time	Sample ID	Matrix	Number of Containers	NWTPH - Dx	NWTPH-Gx	BTEX	VOCs	PAHs	Total 8 Metals	PCBs	Total Arsenic	Residual EPA Method 8081B	Comments	Lab I.D.
7/25/18	1105	Miller-GB1	S	2	X	X						X	X		
	1110	Miller-GB2		1	X	X						X	X		
↓	1115	Miller-GB3	↓	↓	X	X						X	X		

Relinquished By: Date Time
Company:

Received By: Date Time
Company:

Relinquished By: Date Time
Company:

Received By: Date Time
Laboratory:

Please send reports electronically to bmacdonald@3kingsinc.com by the specified turn-around.
Invoices can be sent to afalk@3kingsinc.com

3 KINGS ENVIRONMENTAL • EXCAVATING • DEMO

3 Kings Environmental, Inc.
1311 SE Grace Ave
Battle Ground, WA 98604

p. 360.666.5464
f. 360.666.8202
www.3kings.com

DRAFT REPORT

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3 Kings Environmental	Project: **DNR - Webster**	
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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0663 - 07 30 18 1425**

APEX LABS COOLER RECEIPT FORM

Client: 3 Kings Element WO#: A8G0663

Project/Project #: DNR-Webster / 218076

Delivery info:

Date/Time Received: 7-25-18 @ 1335 By: MM

Delivered by: Apex X Client ___ ESS ___ FedEx ___ UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: MM : 7-25-18 @ 1455

Chain of Custody Included? Yes X No ___ Custody Seals? Yes ___ No X

Signed/Dated by Client? Yes X No ___

Signed/Dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)	3.3						
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)							
Ice Type: (Gel/Real/Other)							
Condition:	good						

Cooler out of temp? (Y/N) Possible reason why: ___

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: ___ : 7/25/18 @ 1502

All Samples Intact? Yes ✓ No ___ Comments: ___

Bottle Labels/COCs agree? Yes ✓ No ___ Comments: ___

Containers/Volumes Received Appropriate for Analysis? Yes ✓ No ___ Comments:

Do VOA Vials have Visible Headspace? Yes ___ No ___ NA ✓

Comments ___

Water Samples: pH Checked and Appropriate (except VOAs): Yes ___ No ___ NA ✓

Comments: ___

Additional Information: ___

Labeled by: ___ Witness: MM Cooler Inspected by: ___ See Project Contact Form: Y

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MILES
SAND & GRAVEL

OFFICE: 253.833.3705
FAX: 253.833.3746

400 Valley Ave NE
Puyallup, WA 98372-2516

APPROVED
By Kent Wiken PE at 10:33 am, Jul 27, 2018

MIX SUBMITTAL

Date Issued : 7/27/2018

Customer: 3 Kings Environmental

Project: Tumwater CDF **Slump:** fluid " max

Mix I.D.: 11CDADUN **Design f'c:** psi

Absorption	Specific Gravity	Material	Batch weight SSD (lbs)		Material Volume
-	-		-	-	-
-	-		-	-	-
-	-		-	-	-
2.14	2.65	ASTM C-33 Sand	2,360	lbs.	14.27
	3.15	Type I-II (Cement)	150	lbs.	0.76
	2.25	Class F (Fly Ash)	350	lbs.	2.49
	-		-	-	-
	1.00	Water	350.0	lbs.	5.61
		%Air (design)	15.00%		4.05
		MasterAir AE-90 (Air Ent.)	1 - 20	oz.	
				-	
				-	
				-	

W/C Ratio:	0.70	Density: 118.1	Design Volume:	27.19

Notes: * ASTM C 94 (5.6) "The purchaser shall ensure that the manufacturer is provided copies of all reports of tests performed on concrete samples taken to determine compliance with specification requirements. Reports shall be provided on a timely basis."

* Miles S&G does not acknowledge test lab data that does not conform completely to ASTM standards.
* Point of placement, for mix conformance, is at the end of the discharge chute of the mixer.
* Miles S&G is not responsible for changes in the mix due to placement methods.
* Concrete placed that exceeds the maximum design slump, is placed at the risk of the contractor and owner.

Remarks: **Controlled Density Fill**

We request copies of all reports for compressive strength, according to ASTM C-94, for the purpose of monitoring performance of the mix. Sent to: keithm@gravelpits.com

Submitted by: *Scott Campbell*

MILES
SAND & GRAVEL

OFFICE: 253.833.3705
FAX: 253.833.3746

400 Valley Ave NE
Puyallup, WA 98372-2516

APPROVED
By Kent Wiken PE at 10:34 am, Jul 27, 2018

Concrete Cylinder Report

Concrete Mix ID:	11CDADUN
Spec'd Strength:	
Number of Tests:	2
Average Range(PSI):	3
Standard Deviation:	21
Coefficient of Variation, V:	5.6%
Within-Test Std Dev(PSI):	2
Within-Test Coeff. of Var.	0.6%
Batch-to-Batch Std Dev (PSI):	21
Batch-to-Batch Coeff. of Var.	5.6%

ACI 318 Performance Approval	
Modification Factor:	0.000
Standard Deviation:	0
Fcr= Fc + 1.34(s):	#VALUE!
Fcr= Fc + 2.33(s) - 500:	#VALUE!

Average	**0.67**	**0.0%**	**0**	**0**	**#DIV/0!**	**370**
Max:	*10.00*	*0.0%*	*0*	*0*	*0*	*380*
Min:	*0.00*	*0.0%*	*0*	*0*	*0*	*350*

	Date	Slump	Air	CT	AT	7 Day	28 Day
1		10.00					350
2		10.00					380
3							
4							
5							
6							
7							
8							
9							
10							
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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Monday, August 6, 2018

Brett MacDonald
3 Kings Environmental
1311 SE Grace Ave
Battle Ground, WA 98604

RE: A8G0817 - Webster Nursery - 218076

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A8G0817, which was received by the laboratory on 7/31/2018 at 12:21:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: DAuvil@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of final reporting, unless prior arrangements have been made.

Apex Laboratories, LLC

12232 S.W. Garden Place
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3 Kings Environmental	Project: **Webster Nursery**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Miles-SAND A	A8G0817-01	Soil	07/30/18 13:10	07/31/18 12:21
Miles-SAND B	A8G0817-02	Soil	07/30/18 13:15	07/31/18 12:21
Miles-SAND C	A8G0817-03	Soil	07/30/18 13:20	07/31/18 12:21

DRAFT REPORT

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3 Kings Environmental	Project: **Webster Nursery**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND A (A8G0817-01)				**Matrix: Soil**			**Batch: 8080386**	
Diesel	ND	---	25.0	mg/kg dry	1	08/01/18	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg dry	1	08/01/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 90 %*		*Limits: 50-150 %*	*1*	*08/01/18*	*NWTPH-Dx*	
Miles-SAND B (A8G0817-02)				**Matrix: Soil**			**Batch: 8080386**	
Diesel	ND	---	25.0	mg/kg dry	1	08/02/18	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg dry	1	08/02/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 86 %*		*Limits: 50-150 %*	*1*	*08/02/18*	*NWTPH-Dx*	
Miles-SAND C (A8G0817-03)				**Matrix: Soil**			**Batch: 8080386**	
Diesel	ND	---	25.0	mg/kg dry	1	08/02/18	NWTPH-Dx	
Oil	ND	---	50.0	mg/kg dry	1	08/02/18	NWTPH-Dx	
Surrogate: o-Terphenyl (Surr)		*Recovery: 83 %*		*Limits: 50-150 %*	*1*	*08/02/18*	*NWTPH-Dx*	

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3 Kings Environmental	Project: **Webster Nursery**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND A (A8G0817-01)				**Matrix: Soil**			**Batch: 8071214**	**V-15**
Gasoline Range Organics	ND	---	5.02	mg/kg dry	50	07/31/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*98 %*	*Limits: 50-150 %*	*1*	*07/31/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*95 %*	*50-150 %*	*1*	*07/31/18*	*NWTPH-Gx (MS)*	
Miles-SAND B (A8G0817-02)				**Matrix: Soil**			**Batch: 8071214**	**V-15**
Gasoline Range Organics	ND	---	4.45	mg/kg dry	50	07/31/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*98 %*	*Limits: 50-150 %*	*1*	*07/31/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*96 %*	*50-150 %*	*1*	*07/31/18*	*NWTPH-Gx (MS)*	
Miles-SAND C (A8G0817-03)				**Matrix: Soil**			**Batch: 8071214**	**V-15**
Gasoline Range Organics	ND	---	4.72	mg/kg dry	50	07/31/18	NWTPH-Gx (MS)	
Surrogate: 4-Bromofluorobenzene (Sur)		*Recovery:*	*97 %*	*Limits: 50-150 %*	*1*	*07/31/18*	*NWTPH-Gx (MS)*	
1,4-Difluorobenzene (Sur)			*97 %*	*50-150 %*	*1*	*07/31/18*	*NWTPH-Gx (MS)*	

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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND A (A8G0817-01)				**Matrix: Soil**			**Batch: 8080369**	
Aldrin	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
alpha-BHC	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
beta-BHC	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
delta-BHC	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
gamma-BHC (Lindane)	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
cis-Chlordane	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
trans-Chlordane	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDD	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDE	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDT	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Dieldrin	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan I	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan II	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan sulfate	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin Aldehyde	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin ketone	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Heptachlor	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Heptachlor epoxide	ND	---	0.935	ug/kg dry	1	08/02/18	EPA 8081B	
Methoxychlor	ND	---	2.81	ug/kg dry	1	08/02/18	EPA 8081B	
Chlordane (Technical)	ND	---	28.1	ug/kg dry	1	08/02/18	EPA 8081B	
Toxaphene (Total)	ND	---	28.1	ug/kg dry	1	08/02/18	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)		*Recovery:*	*92 %*	*Limits: 42-129 %*	*1*	*08/02/18*	*EPA 8081B*	
Decachlorobiphenyl (Surr)			*111 %*	*65-151 %*	*1*	*08/02/18*	*EPA 8081B*	
Miles-SAND B (A8G0817-02)				**Matrix: Soil**			**Batch: 8080369**	
Aldrin	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
alpha-BHC	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
beta-BHC	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
delta-BHC	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
gamma-BHC (Lindane)	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
cis-Chlordane	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
trans-Chlordane	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	

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1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND B (A8G0817-02)				**Matrix: Soil**			**Batch: 8080369**	
4,4'-DDD	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDE	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDT	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Dieldrin	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan I	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan II	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan sulfate	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin Aldehyde	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin ketone	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Heptachlor	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Heptachlor epoxide	ND	---	0.936	ug/kg dry	1	08/02/18	EPA 8081B	
Methoxychlor	ND	---	2.81	ug/kg dry	1	08/02/18	EPA 8081B	
Chlordane (Technical)	ND	---	28.1	ug/kg dry	1	08/02/18	EPA 8081B	
Toxaphene (Total)	ND	---	28.1	ug/kg dry	1	08/02/18	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)		*Recovery:*	*95 %*	*Limits: 42-129 %*	*1*	*08/02/18*	*EPA 8081B*	
Decachlorobiphenyl (Surr)			*117 %*	*65-151 %*	*1*	*08/02/18*	*EPA 8081B*	
Miles-SAND C (A8G0817-03)				**Matrix: Soil**			**Batch: 8080369**	
Aldrin	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
alpha-BHC	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
beta-BHC	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
delta-BHC	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
gamma-BHC (Lindane)	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
cis-Chlordane	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
trans-Chlordane	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDD	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDE	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
4,4'-DDT	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Dieldrin	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan I	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan II	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Endosulfan sulfate	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	

DRAFT REPORT

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

3 Kings Environmental	Project: **Webster Nursery**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND C (A8G0817-03)				**Matrix: Soil**		**Batch: 8080369**		
Endrin	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin Aldehyde	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Endrin ketone	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Heptachlor	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Heptachlor epoxide	ND	---	0.891	ug/kg dry	1	08/02/18	EPA 8081B	
Methoxychlor	ND	---	2.67	ug/kg dry	1	08/02/18	EPA 8081B	
Chlordane (Technical)	ND	---	26.7	ug/kg dry	1	08/02/18	EPA 8081B	
Toxaphene (Total)	ND	---	26.7	ug/kg dry	1	08/02/18	EPA 8081B	
Surrogate: 2,4,5,6-TCMX (Surr)			*Recovery: 91 %*	*Limits: 42-129 %*	*1*	*08/02/18*	*EPA 8081B*	
Decachlorobiphenyl (Surr)			*112 %*	*65-151 %*	*1*	*08/02/18*	*EPA 8081B*	

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1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND A (A8G0817-01)				**Matrix: Soil**				
Batch: 8080384								
Arsenic	ND	---	1.07	mg/kg dry	10	08/01/18	EPA 6020A	
Miles-SAND B (A8G0817-02)				**Matrix: Soil**				
Batch: 8080384								
Arsenic	ND	---	1.11	mg/kg dry	10	08/01/18	EPA 6020A	
Miles-SAND C (A8G0817-03)				**Matrix: Soil**				
Batch: 8080384								
Arsenic	**1.56**	---	1.05	mg/kg dry	10	08/01/18	EPA 6020A	

Highlighted results have not undergone full secondary data review at the time of reporting.
Results are subject to change upon final review and reporting.

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ANALYTICAL SAMPLE RESULTS

Percent Dry Weight

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
Miles-SAND A (A8G0817-01)				**Matrix: Soil**			**Batch: 8071191**	
% Solids	**98.9**	---	1.00	% by Weight	1	08/01/18	EPA 8000C	
Miles-SAND B (A8G0817-02)				**Matrix: Soil**			**Batch: 8080405**	
% Solids	**99.4**	---	1.00	% by Weight	1	08/03/18	EPA 8000C	
Miles-SAND C (A8G0817-03)				**Matrix: Soil**			**Batch: 8080399**	
% Solids	**97.3**	---	1.00	% by Weight	1	08/02/18	EPA 8000C	

DRAFT REPORT

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QUALITY CONTROL (QC) SAMPLE RESULTS

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080386 - EPA 3546 (Fuels)							**Soil**					
Blank (8080386-BLK1)			Prepared: 08/01/18 13:33		Analyzed: 08/01/18 20:26							
NWTPH-Dx												
Diesel	ND	---	25.0	mg/kg wet	1	---	---	---	---	---	---	
Oil	ND	---	50.0	mg/kg wet	1	---	---	---	---	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 91 %*	*Limits: 50-150 %*		*Dilution: 1x*							
LCS (8080386-BS1)			Prepared: 08/01/18 13:33		Analyzed: 08/01/18 20:47							
NWTPH-Dx												
Diesel	104	---	25.0	mg/kg wet	1	125	---	83	76-115%	---	---	
Surr: o-Terphenyl (Surr)		*Recovery: 85 %*	*Limits: 50-150 %*		*Dilution: 1x*							

DRAFT REPORT

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QUALITY CONTROL (QC) SAMPLE RESULTS

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071214 - EPA 5035A							**Soil**					
Blank (8071214-BLK1)			Prepared: 07/31/18 16:00		Analyzed: 07/31/18 17:45							
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	3.33	mg/kg wet	50	---	---	---	---	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery:*	*95 %*	*Limits:*	*50-150 %*		*Dilution:*	*1x*				
1,4-Difluorobenzene (Sur)			*94 %*		*50-150 %*			*"*				
LCS (8071214-BS2)			Prepared: 07/31/18 16:00		Analyzed: 07/31/18 17:17							
NWTPH-Gx (MS)												
Gasoline Range Organics	24.0	---	5.00	mg/kg wet	50	25.0	---	96	80-120%	---	---	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery:*	*94 %*	*Limits:*	*50-150 %*		*Dilution:*	*1x*				
1,4-Difluorobenzene (Sur)			*96 %*		*50-150 %*			*"*				
Duplicate (8071214-DUP1)			Prepared: 07/31/18 15:20		Analyzed: 07/31/18 18:42							**V-15**
QC Source Sample: Miles-SAND A (A8G0817-01)												
NWTPH-Gx (MS)												
Gasoline Range Organics	ND	---	4.97	mg/kg dry	50	---	ND	---	---	---	30%	
Surr: 4-Bromofluorobenzene (Sur)		*Recovery:*	*98 %*	*Limits:*	*50-150 %*		*Dilution:*	*1x*				
1,4-Difluorobenzene (Sur)			*96 %*		*50-150 %*			*"*				

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QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080369 - EPA 3546							**Soil**					
Blank (8080369-BLK1)			Prepared: 08/01/18 09:26		Analyzed: 08/02/18 12:44							
EPA 8081B												
Aldrin	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
alpha-BHC	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
beta-BHC	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
delta-BHC	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
gamma-BHC (Lindane)	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
cis-Chlordane	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
trans-Chlordane	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
4,4'-DDD	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
4,4'-DDE	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
4,4'-DDT	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Dieldrin	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Endosulfan I	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Endosulfan II	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Endosulfan sulfate	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Endrin	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Endrin Aldehyde	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Endrin ketone	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Heptachlor	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Heptachlor epoxide	ND	---	0.833	ug/kg wet	1	---	---	---	---	---	---	
Methoxychlor	ND	---	2.50	ug/kg wet	1	---	---	---	---	---	---	
Chlordane (Technical)	ND	---	25.0	ug/kg wet	1	---	---	---	---	---	---	
Toxaphene (Total)	ND	---	25.0	ug/kg wet	1	---	---	---	---	---	---	
Surr: 2,4,5,6-TCMX (Surr)			*Recovery: 86 %*		*Limits: 42-129 %*			*Dilution: 1x*				
Decachlorobiphenyl (Surr)			*102 %*		*65-151 %*			*"*				
LCS (8080369-BS1)			Prepared: 08/01/18 09:26		Analyzed: 08/02/18 13:01							
EPA 8081B												
Aldrin	50.9	---	1.00	ug/kg wet	1	50.0	---	102	45-136%	---	---	
alpha-BHC	51.8	---	1.00	ug/kg wet	1	50.0	---	104	45-137%	---	---	
beta-BHC	50.9	---	1.00	ug/kg wet	1	50.0	---	102	50-136%	---	---	
delta-BHC	50.0	---	1.00	ug/kg wet	1	50.0	---	100	47-139%	---	---	
gamma-BHC (Lindane)	53.8	---	1.00	ug/kg wet	1	50.0	---	108	49-135%	---	---	
cis-Chlordane	52.7	---	1.00	ug/kg wet	1	50.0	---	105	54-133%	---	---	

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1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

QUALITY CONTROL (QC) SAMPLE RESULTS

Organochlorine Pesticides by EPA 8081B

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080369 - EPA 3546							**Soil**					
LCS (8080369-BS1)			Prepared: 08/01/18 09:26		Analyzed: 08/02/18 13:01							
trans-Chlordane	52.5	---	1.00	ug/kg wet	1	50.0	---	105	53-135%	---	---	
4,4'-DDD	50.4	---	1.00	ug/kg wet	1	50.0	---	101	56-139%	---	---	
4,4'-DDE	50.8	---	1.00	ug/kg wet	1	50.0	---	102	56-134%	---	---	
4,4'-DDT	59.9	---	1.00	ug/kg wet	1	50.0	---	120	50-141%	---	---	
Dieldrin	54.7	---	1.00	ug/kg wet	1	50.0	---	109	56-136%	---	---	
Endosulfan I	52.1	---	1.00	ug/kg wet	1	50.0	---	104	52-132%	---	---	
Endosulfan II	54.6	---	1.00	ug/kg wet	1	50.0	---	109	53-134%	---	---	
Endosulfan sulfate	54.2	---	1.00	ug/kg wet	1	50.0	---	108	55-136%	---	---	
Endrin	60.9	---	1.00	ug/kg wet	1	50.0	---	122	56-140%	---	---	
Endrin Aldehyde	48.7	---	1.00	ug/kg wet	1	50.0	---	97	35-137%	---	---	
Endrin ketone	57.9	---	1.00	ug/kg wet	1	50.0	---	116	55-136%	---	---	
Heptachlor	55.9	---	1.00	ug/kg wet	1	50.0	---	112	47-136%	---	---	
Heptachlor epoxide	51.9	---	1.00	ug/kg wet	1	50.0	---	104	52-136%	---	---	
Methoxychlor	62.0	---	3.00	ug/kg wet	1	50.0	---	124	52-143%	---	---	
Surr: 2,4,5,6-TCMX (Surr)			*Recovery: 87 %*		*Limits: 42-129 %*			*Dilution: 1x*				
Decachlorobiphenyl (Surr)			*104 %*		*65-151 %*			*"*				

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QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080384 - EPA 3051A							**Soil**					
Blank (8080384-BLK1)			Prepared: 08/01/18 12:40 Analyzed: 08/01/18 18:42									
EPA 6020A												
Arsenic	ND	---	0.962	mg/kg wet	10	---	---	---	---	---	---	
LCS (8080384-BS1)			Prepared: 08/01/18 12:40 Analyzed: 08/01/18 18:47									
EPA 6020A												
Arsenic	51.4	---	1.00	mg/kg wet	10	50.0	---	103	80-120%	---	---	
Duplicate (8080384-DUP1)			Prepared: 08/01/18 12:40 Analyzed: 08/01/18 19:18									
QC Source Sample: Miles-SAND C (A8G0817-03)												
EPA 6020A												
Arsenic	**1.58**	---	0.992	mg/kg dry	10	---	1.56	---	---	1	40%	
Matrix Spike (8080384-MS1)			Prepared: 08/01/18 12:40 Analyzed: 08/01/18 19:22									
QC Source Sample: Miles-SAND C (A8G0817-03)												
EPA 6020A												
Arsenic	53.1	---	1.04	mg/kg dry	10	52.1	1.56	99	75-125%	---	---	

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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8071191 - Total Solids (Dry Weight)							**Soil**					

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080399 - Total Solids (Dry Weight)							**Soil**					
Duplicate (8080399-DUP1)			Prepared: 08/02/18 06:38		Analyzed: 08/02/18 11:47							
QC Source Sample: Miles-SAND C (A8G0817-03)												
EPA 8000C												
% Solids	**97.4**	---	1.00	% by Weight	1	---	97.3	---	---	0.1	10%	

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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QUALITY CONTROL (QC) SAMPLE RESULTS

Percent Dry Weight

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080405 - Total Solids (Dry Weight)							**Soil**					

No Client related Batch QC samples analyzed for this batch. See notes page for more information.

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SAMPLE PREPARATION INFORMATION

Diesel and/or Oil Hydrocarbons by NWTPH-Dx

Prep: EPA 3546 (Fuels)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8080386							
A8G0817-01	Soil	NWTPH-Dx	07/30/18 13:10	08/01/18 13:33	10.81g/5mL	10g/5mL	0.93
A8G0817-02	Soil	NWTPH-Dx	07/30/18 13:15	08/01/18 13:33	10.67g/5mL	10g/5mL	0.94
A8G0817-03	Soil	NWTPH-Dx	07/30/18 13:20	08/01/18 13:33	10.49g/5mL	10g/5mL	0.95

Gasoline Range Hydrocarbons (Benzene through Naphthalene) by NWTPH-Gx

Prep: EPA 5035A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071214							
A8G0817-01	Soil	NWTPH-Gx (MS)	07/30/18 13:10	07/31/18 15:20	5.09g/5mL	5g/5mL	0.98
A8G0817-02	Soil	NWTPH-Gx (MS)	07/30/18 13:15	07/31/18 15:20	5.68g/5mL	5g/5mL	0.88
A8G0817-03	Soil	NWTPH-Gx (MS)	07/30/18 13:20	07/31/18 15:20	5.61g/5mL	5g/5mL	0.89

Organochlorine Pesticides by EPA 8081B

Prep: EPA 3546

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8080369							
A8G0817-01	Soil	EPA 8081B	07/30/18 13:10	08/01/18 09:26	10.81g/5mL	10g/5mL	0.93
A8G0817-02	Soil	EPA 8081B	07/30/18 13:15	08/01/18 09:26	10.74g/5mL	10g/5mL	0.93
A8G0817-03	Soil	EPA 8081B	07/30/18 13:20	08/01/18 09:26	11.53g/5mL	10g/5mL	0.87

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8080384							
A8G0817-01	Soil	EPA 6020A	07/30/18 13:10	08/01/18 12:40	0.472g/50mL	0.5g/50mL	1.06
A8G0817-02	Soil	EPA 6020A	07/30/18 13:15	08/01/18 12:40	0.453g/50mL	0.5g/50mL	1.10
A8G0817-03	Soil	EPA 6020A	07/30/18 13:20	08/01/18 12:40	0.489g/50mL	0.5g/50mL	1.02

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8071191							

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3 Kings Environmental	Project: **Webster Nursery**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

SAMPLE PREPARATION INFORMATION

Percent Dry Weight

Prep: Total Solids (Dry Weight)

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
A8G0817-01	Soil	EPA 8000C	07/30/18 13:10	07/31/18 17:35			NA
Batch: 8080399							
A8G0817-03	Soil	EPA 8000C	07/30/18 13:20	08/02/18 06:38			NA
Batch: 8080405							
A8G0817-02	Soil	EPA 8000C	07/30/18 13:15	08/02/18 09:04			NA

DRAFT REPORT

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

3 Kings Environmental	Project: **Webster Nursery**	
1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

V-15 Sample aliquot was subsampled from the sample container. The subsampled aliquot was preserved in the laboratory within 48 hours of sampling.

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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('-----'), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) may not be included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

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1311 SE Grace Ave	Project Number: **218076**	**Report ID:**
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

LABORATORY ACCREDITATION INFORMATION

TNI Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories, LLC

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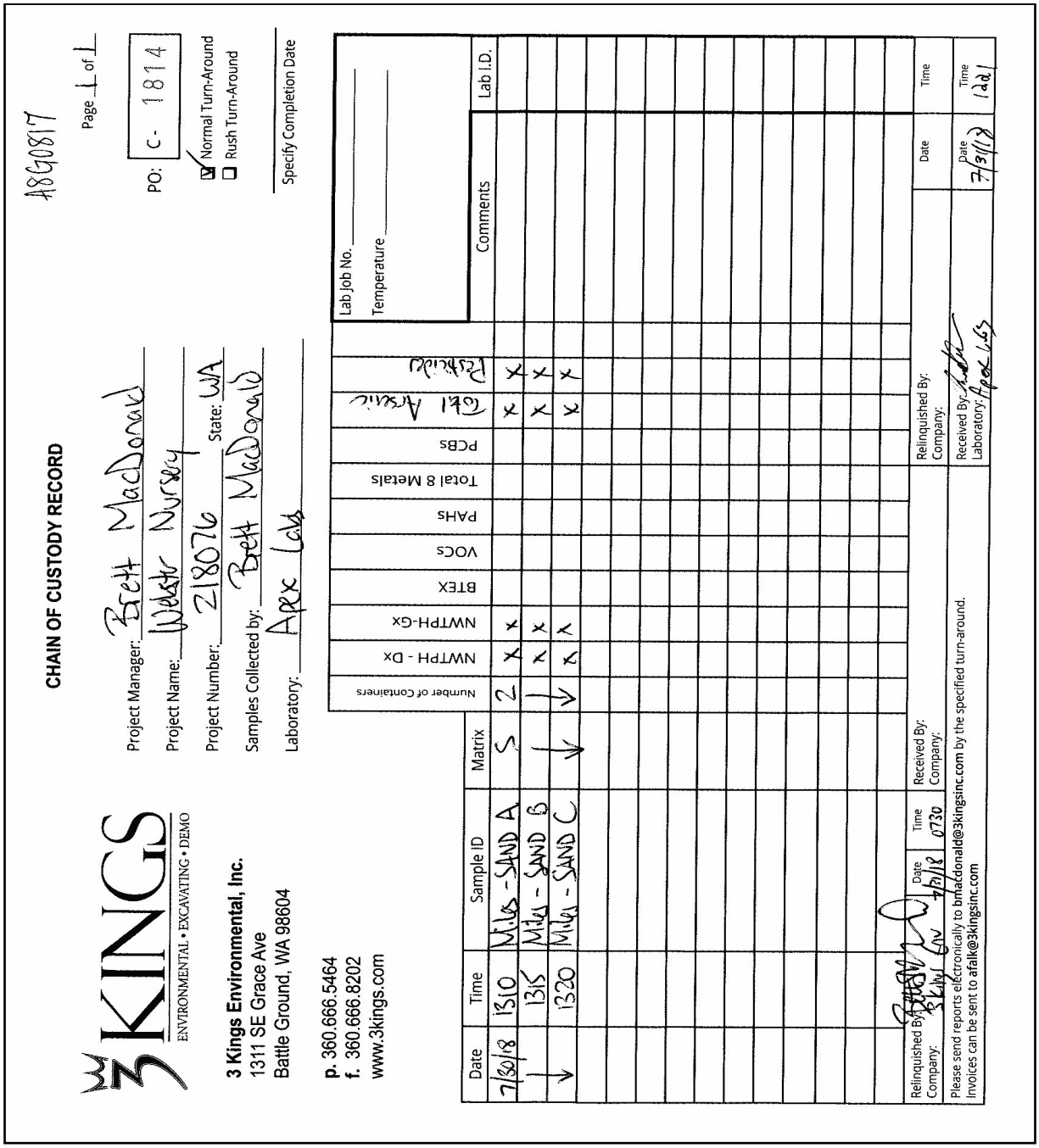
Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**



CHAIN OF CUSTODY RECORD

A8G0817

Page 1 of 1

PO: C - 1814

☑ Normal Turn-Around
☐ Rush Turn-Around

Specify Completion Date

Project Manager: Brett MacDonald
Project Name: Webster Nursery
Project Number: 218076 State: WA
Samples Collected by: Brett MacDonald
Laboratory: Apex Labs

Lab Job No.
Temperature

Date	Time	Sample ID	Matrix	Number of Containers	NWTPH - Dx	NWTPH-Gx	BTEX	VOCs	PAHs	Total 8 Metals	PCBs	Cobalt Arsenic	Perchlorate	Comments	Lab I.D.
7/30/18	1310	Miles - Sand A	S	2	X	X						X	X		
"	1315	Miles - Sand B	"	1	X	X						X	X		
"	1320	Miles - Sand C	"	"	X	X						X	X		

Relinquished By: Date 7/31/18 Time 0730
Company: 3KINGS
Received By:
Company:

Please send reports electronically to brmacdonald@3kingsinc.com by the specified turn-around.
Invoices can be sent to afalk@3kingsinc.com

Relinquished By: Date 7/31/18 Time 1441
Company: Apex Labs
Received By:
Company:

3 KINGS ENVIRONMENTAL • EXCAVATING • DEMO

3 Kings Environmental, Inc.
1311 SE Grace Ave
Battle Ground, WA 98604

p. 360.666.5464
f. 360.666.8202
www.3kings.com

DRAFT REPORT

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3 Kings Environmental	Project: **Webster Nursery**	
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Battle Ground, WA 98604	Project Manager: **Brett MacDonald**	**A8G0817 - 08 06 18 1231**

APEX LABS COOLER RECEIPT FORM

Client: 3 Kings Element WO#: A8G0817

Project/Project #: Webster Nursery 218076

Delivery info:

Date/Time Received: 7/31/18 @ 1221 By: CFH

Delivered by: Apex X Client ___ ESS ___ FedEx ___ UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: CFH : 7/31/18 @ 1436

Chain of Custody Included? Yes X No ___ Custody Seals? Yes ___ No X

Signed/Dated by Client? Yes X No ___

Signed/Dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)							
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)	3.6						
Ice Type: (Ge)/Real/Other)							
Condition:	Good						

Cooler out of temp? (Y/N) Possible reason why:

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: (illegible) : 7/31/18 @ 1455

All Samples Intact? Yes ✓ No ___ Comments:

Bottle Labels/COCs agree? Yes ✓ No ___ Comments:

Containers/Volumes Received Appropriate for Analysis? Yes ✓ No ___ Comments:

Do VOA Vials have Visible Headspace? Yes ___ No ___ NA ✓

Comments

Water Samples: pH Checked and Appropriate (except VOAs): Yes ___ No ___ NA ✓

Comments:

Additional Information:

Labeled by: (illegible) Witness: TG Cooler Inspected by: CFH See Project Contact Form: Y

DRAFT REPORT

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APPENDIX G

Well Logs

SW-9R

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. RE16353

Construction/Decommission 306-18-1130

Type of Well

[X] Construction
[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

[X] Resource Protection
[ ] Geotechnical Soil Boring

Property Owner Department of Natural Resources
Site Address 9805 SW Blomberg RDSW
City Tumwater County Thurston EWM

Consulting Firm 3 Kings ENV

Unique Ecology Well ID Tag No. BKR472

Location 1/4 SE 1/4 NE Sec 20 Twn 17N R 2W or WWM

WELL CONSTRUCTION CERTIFICATION I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s,t,r still Required) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 12720130000

[X] Driller [ ] Trainee Name (Print) Galbreth Ryan

Driller/Trainee Signature _____

Driller/Trainee License No. 2522

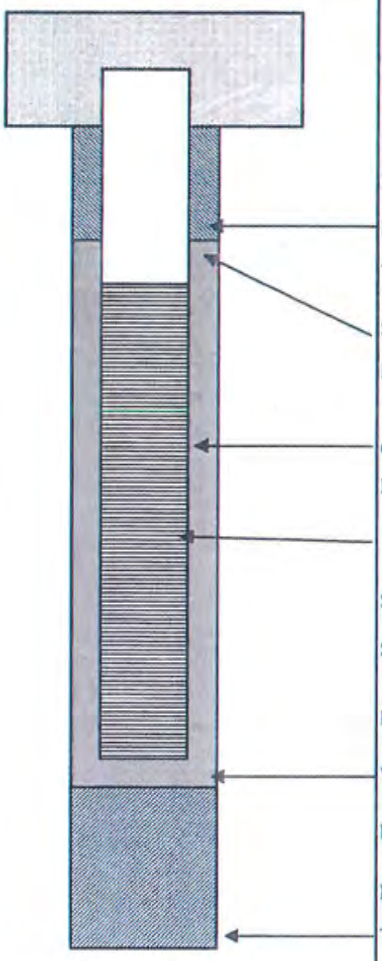
Cased Diameter 4.50 OD Static Level 10

Work/Decommission Start Date 8/16/18

If trainee, licensed driller's Signature and License No. _____

Work/Decommission End Date 8/16/18

Construction/Design



Well Name:

Concrete Surface Seal Depth	0 - 1	FT
Blank Casing (dia x dep)	2 " .5 x 10	FT
Material	PVC	
Backfill	1-8	FT
Type	Bentonite Chips	
Seal	8 - 9	FT
Material	Granular Bentonite	
Gravel Pack	9-16	FT
Material	10/20 Sand	
Screen (dia x dep)	2 " x	FT
Slot Size	.010	
Material	PVC	
Well Depth	16	FT
Backfill		
Material		
Total Hole Depth	16	FT

Formation Description

0 - 5 Silty Sand	FT
5 - 16 Coarse Sand (Dark Grey)	FT
-	FT
-	FT
-	FT
-	FT
-	FT
-	FT
-	FT
-	FT

Scale 1" = _____

ECY 050-12 (Rev 2/01)

SW-10R

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. RE16353

Construction/Decommission 306-18-1130

Type of Well

[X] Construction
[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

[X] Resource Protection
[ ] Geotechnical Soil Boring

Property Owner Department of Natural Resources
Site Address 9805 SW Blomberg RDSW
City Tumwater County Thurston

Consulting Firm 3 Kings ENV

Unique Ecology Well ID Tag No. BKR473

Location 1/4 SE 1/4 NE Sec 20 Twn 17N R 2W or EWM WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s,t,r still Required) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 12720130000

[X] Driller [ ] Trainee Name (Print) Galbreth Ryan

Driller/Trainee Signature _____

Driller/Trainee License No. 2522

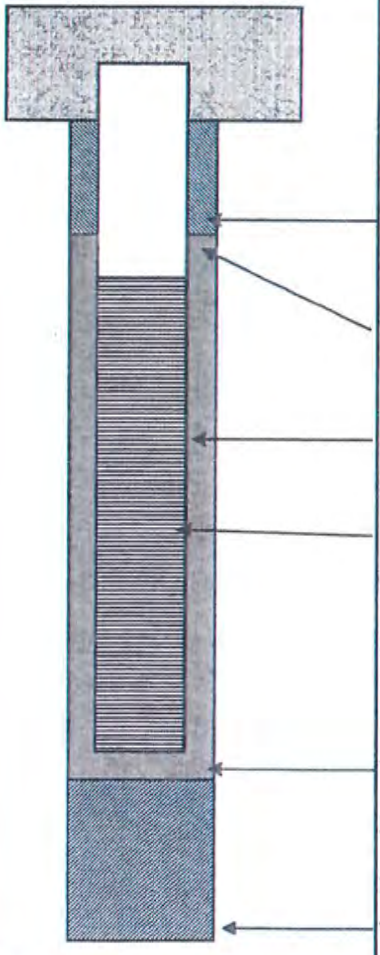
Cased Diameter 4.50" Static Leve. 9

Work/Decommission Start Date 8/16/18

If trainee, licensed driller's Signature and License No. _____

Work/Decommission End Date 8/16/18

Construction/Design — **Well Name:**



Concrete Surface Seal Depth	0 - 1 FT	
Blank Casing (dia x dep)	2 " .5 x 10 FT	
Material	PVC	
Backfill	1 - 8 FT	
Type	Bentonite Chips	
Seal	8 - 9 FT	
Material	Granular Bentonite	
Gravel Pack	9 - 16 FT	
Material	10/20 Sand	
Screen (dia x dep)	2 " x FT	
Slot Size	.010	
Material	PVC	
Well Depth	16 FT	
Backfill		
Material		
Total Hole Depth	16 FT	

Formation Description

0 - 5 FT	Silty Sand
5 - 16 FT	Coarse Sand (Coarse Gray)
- FT	
- FT	
- FT	
- FT	
- FT	
- FT	
- FT	
- FT	

Scale 1" = _____

ECY 050-12 (Rev 2/01)

SW-11R

RESOURCE PROTECTION WELL REPORT

(SUBMIT ONE WELL REPORT PER WELL INSTALLED)

CURRENT
Notice of Intent No. RE16353

Construction/Decommission 306-18-1130

Type of Well

[X] Construction
[ ] Decommission *ORIGINAL INSTALLATION Notice of Intent Number* _____

[X] Resource Protection
[ ] Geotechnical Soil Boring

Property Owner Department of Natural Resources
Site Address 9805 SW Blomberg RDSW
City Tumwater County Thurston

Consulting Firm 3 Kings ENV

Unique Ecology Well ID
Tag No. BKR479

Location 1/4 SE 1/4 NE Sec 20 Twn 17N R 2W or EWM WWM

WELL CONSTRUCTION CERTIFICATION: I constructed and/or accept responsibility for construction of this well, and its compliance with all Washington well construction standards. Materials used and the information reported above are true to my best knowledge and belief.

Lat/Long (s,t,r still Required) Lat Deg _____ Lat Min/Sec _____ Long Deg _____ Long Min/Sec _____

Tax Parcel No. 12720130000

[X] Driller [ ] Trainee Name (Print) Galbreth Ryan

Driller/Trainee Signature _____

Driller/Trainee License No. 2522

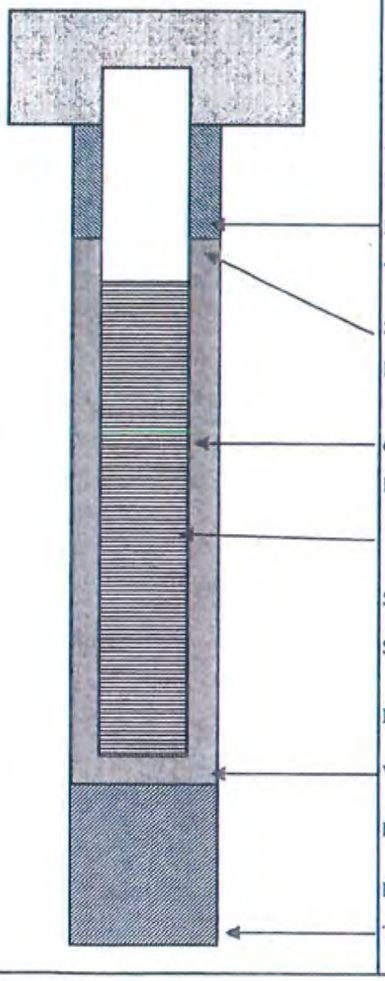
Cased Diameter 4.50" Static Level 10

Work/Decommission Start Date 8/16/18

If trainee, licensed driller's Signature and License No. _____

Work/Decommission End Date 8/16/18

Construction/Design



Well Name:

Concrete Surface Seal Depth	0 - 1	FT
Blank Casing (dia x dep)	2 " .5 x 10	FT
Material	PVC	
Backfill	1-8	FT
Type	Bentonite Chips	
Seal	8 - 9	FT
Material	Granular Bentonite	
Gravel Pack	9 - 16	FT
Material	10/20 Sand	
Screen (dia x dep)	2 " x	FT
Slot Size	.010	
Material	PVC	
Well Depth	16	FT
Backfill		
Material		
Total Hole Depth	16	FT

Formation Description

0 - 5 FT	Silty Sand
5 - 16 FT	Coarse Sand (Dark Gray)
- FT	
- FT	
- FT	
- FT	
- FT	
- FT	
- FT	
- FT	

Scale 1" = _____

ECY 050-12 (Rev 2/01)

Soil Classification System

MAJOR DIVISIONS			GRAPHIC SYMBOL	USCS LETTER SYMBOL[1]	TYPICAL DESCRIPTIONS [2][3]
COARSE-GRAINED SOIL (More than 50% of material is larger than No. 200 sieve size)	GRAVEL AND GRAVELLY SOIL (More than 50% of coarse fraction retained on No. 4 sieve)	CLEAN GRAVEL (Little or no fines)		**GW**	Well-graded gravel; gravel/sand mixture(s); little or no fines
				GP	Poorly graded gravel; gravel/sand mixture(s); little or no fines
		GRAVEL WITH FINES (Appreciable amount of fines)		**GM**	Silty gravel; gravel/sand/silt mixture(s)
				GC	Clayey gravel; gravel/sand/clay mixture(s)
	SAND AND SANDY SOIL (More than 50% of coarse fraction passed through No. 4 sieve)	CLEAN SAND (Little or no fines)		**SW**	Well-graded sand; gravelly sand; little or no fines
				SP	Poorly graded sand; gravelly sand; little or no fines
		SAND WITH FINES (Appreciable amount of fines)		**SM**	Silty sand; sand/silt mixture(s)
				SC	Clayey sand; sand/clay mixture(s)
FINE-GRAINED SOIL (More than 50% of material is smaller than No. 200 sieve size)	SILT AND CLAY (Liquid limit less than 50)			**ML**	Inorganic silt and very fine sand; rock flour; silty or clayey fine sand or clayey silt with slight plasticity
				CL	Inorganic clay of low to medium plasticity; gravelly clay; sandy clay; silty clay; lean clay
				OL	Organic silt; organic, silty clay of low plasticity
	SILT AND CLAY (Liquid limit greater than 50)			**MH**	Inorganic silt; micaceous or diatomaceous fine sand
				CH	Inorganic clay of high plasticity; fat clay
				OH	Organic clay of medium to high plasticity; organic silt
	HIGHLY ORGANIC SOIL			**PT**	Peat; humus; swamp soil with high organic content

OTHER MATERIALS	GRAPHIC SYMBOL	LETTER SYMBOL	TYPICAL DESCRIPTIONS
PAVEMENT		**AC** or **PC**	Asphalt concrete pavement or Portland cement pavement
ROCK		**RK**	Rock (See Rock Classification)
WOOD		**WD**	Wood, lumber, wood chips
DEBRIS		**DB**	Construction debris, garbage

NOTES:

1. USCS letter symbols correspond to symbols used by the Unified Soil Classification System and ASTM classification methods. Dual letter symbols (e.g., SP-SM for sand or gravel) indicate soil with an estimated 5-15% fines. Multiple letter symbols (e.g., ML/CL) indicate borderline or multiple soil classifications.
2. Soil descriptions are based on the general approach presented in the *Standard Practice for Description and Identification of Soils (Visual-Manual Procedure)*, outlined in ASTM D 2488. Where laboratory index testing has been conducted, soil classifications are based on the *Standard Test Method for Classification of Soils for Engineering Purposes*, as outlined in ASTM D 2487.
3. Soil description terminology is based on visual estimates (in the absence of laboratory test data) of the percentages of each soil type and is defined as follows:

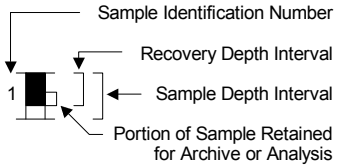
Primary Constituent:	> 50%	"GRAVEL," "SAND," "SILT," "CLAY," etc.
Secondary Constituents:	> 30% and ≤ 50%	"very gravelly," "very sandy," "very silty," etc.
	> 15% and ≤ 30%	"gravelly," "sandy," "silty," etc.
Additional Constituents:	> 5% and ≤ 15%	"with gravel," "with sand," "with silt," etc.
	≤ 5%	"trace gravel," "trace sand," "trace silt," etc., or not noted.

Drilling and Sampling Key

SAMPLER TYPE

Code	Description
a	3.25-inch O.D., 2.42-inch I.D. Split Spoon
b	2.00-inch O.D., 1.50-inch I.D. Split Spoon
c	Shelby Tube
d	Grab Sample
e	Single-Tube Core Barrel
f	Double-Tube Core Barrel
g	Other - See text if applicable
1	300-lb Hammer, 30-inch Drop
2	140-lb Hammer, 30-inch Drop
3	Pushed
4	Rotosonic
5	Air Rotary (Rock)
6	Wash Rotary (Rock)
7	Other - See text if applicable

SAMPLE NUMBER & INTERVAL



Field and Lab Test Data

Code	Description
PP = 1.0	Pocket Penetrometer, tsf
TV = 0.5	Torvane, tsf
PID = 100	Photoionization Detector VOC screening, ppm
W = 10	Moisture Content, %
D = 120	Dry Density, pcf
-200 = 60	Material smaller than No. 200 sieve, %
GS	Grain Size - See separate figure for data
AL	Atterberg Limits - See separate figure for data
VST	Vane Shear Test
GT	Other Geotechnical Testing
CA	Chemical Analysis

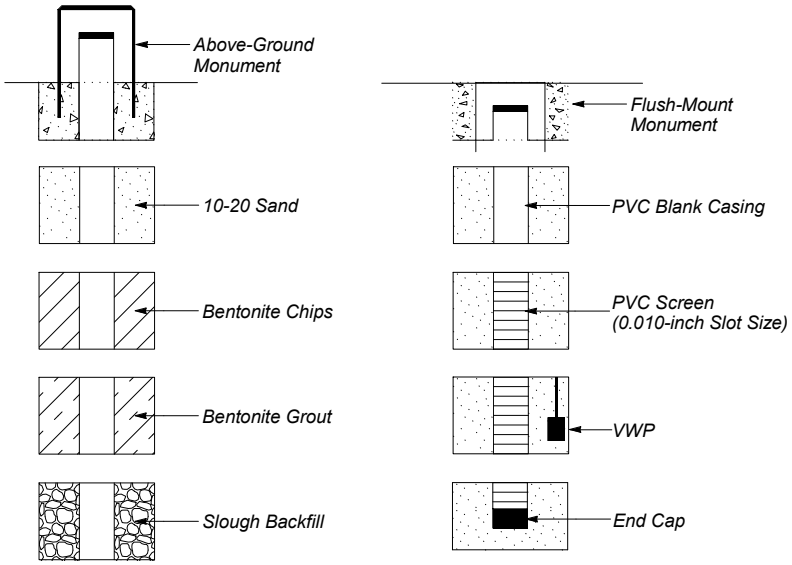
Groundwater

▽ Approximate water elevation at time of drilling (ATD).

▼ Approximate water elevation at other time(s). When multiple water levels are obtained other than ATD, only a representative range is shown. See text for additional information.

Note: Groundwater levels can fluctuate due to precipitation, seasonal conditions, and other factors.

Well Log Graphics



LANDAU ASSOCIATES

Webster Nursery
Olympia, Washington

Soil Classification System and Key

Figure B-1 (2 of 2)

SW-9R

SAMPLE DATA

SOIL PROFILE

GROUNDWATER

Drilling Method: Direct-Push

Ground Elevation (ft): Not Measured

Drilled By: Cascade Drilling Inc.

Monitoring Well Detail
(DOE#: BKR472)

Depth (ft)	Sample Number & Interval	Sampler Type	Blows/Foot	Test Data	Graphic Symbol	USCS Symbol	Soil Description	Water Level
0		d5				SM	Light brown, silty, fine to coarse SAND with gravel; no odor, no sheen (loose, moist) **(RECESSIONAL OUTWASH)**	
2		d3						
4						SP-SM	Light brown, fine to medium SAND with silt; no odor, no sheen (medium dense, moist)	
6								
8		d3				SM	Gray, silty, fine to medium SAND with occassional silt layers; no odor, no sheen; no odor, no sheen (medium dense, wet)	ATD
10							-Slightly mottled from 10.0 - 14.9 ft	
12		d3						
14								
16						ML	Gray, sandy, SILT; no odor, no sheen (medium stiff, wet)	
18								

Flush-mounted monument with locking cap

Bentonite chips

Granular bentonite

2-inch diameter, Schedule 40, PVC well casing

2-inch diameter, Schedule 40, PVC pre-packed screen (0.010-inch slot size) with 10/20 Colorado sand pack and 20/40 stainless steel mesh

Boring Completed 08/16/18
Total Depth of Boring = 16.0 ft.

Monitoring Well Completed 08/16/18
Total Depth of Monitoring Well = 15.9 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

774006.01 9/5/18 N:\PROJECTS\0774006.010.013.GPJ WELL LOG

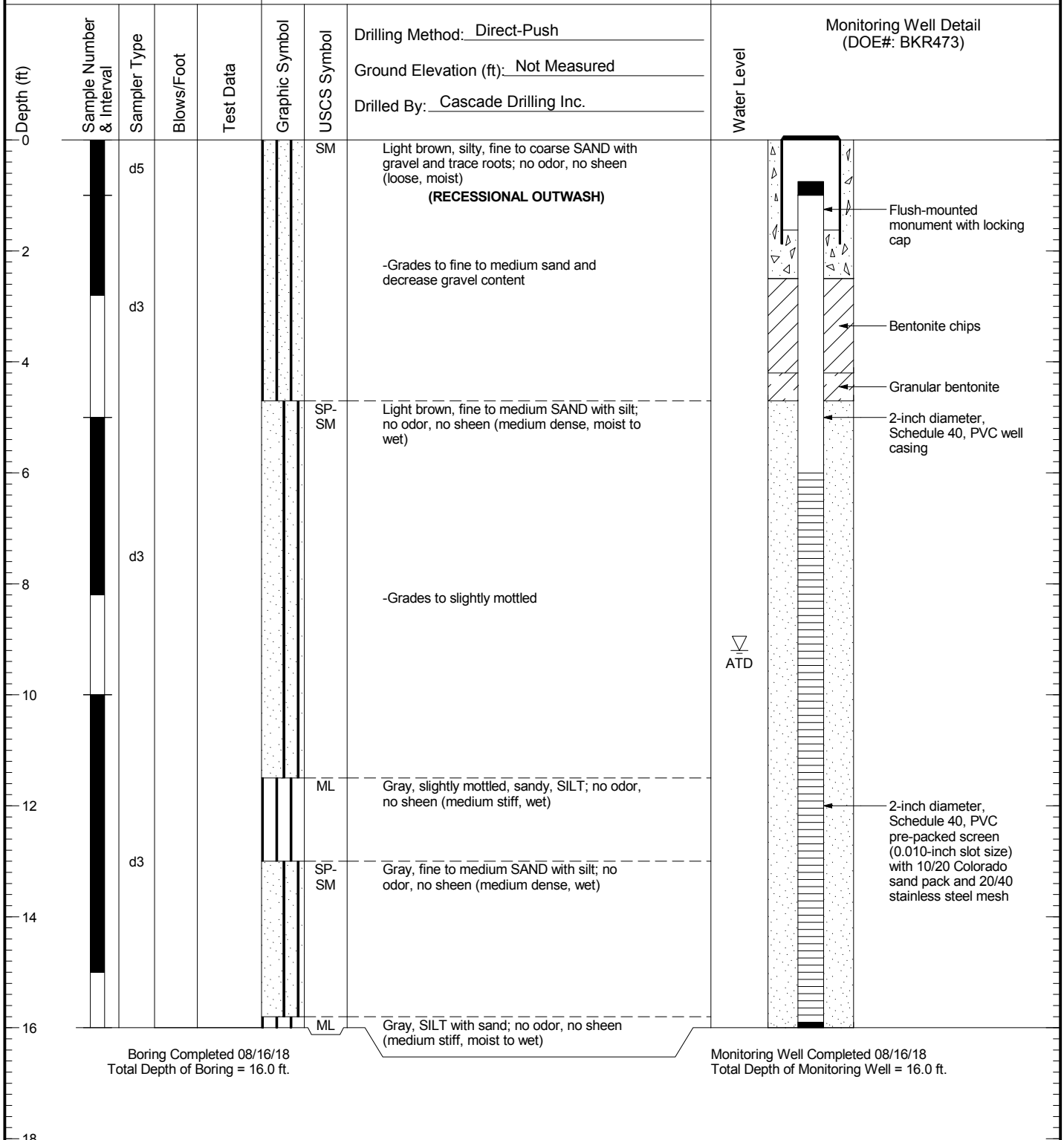
LANDAU ASSOCIATES

Webster Nursery
Olympia, Washington

Log of Monitoring Well SW-9R

Figure
B-

SW-10R



Boring Completed 08/16/18
Total Depth of Boring = 16.0 ft.

Monitoring Well Completed 08/16/18
Total Depth of Monitoring Well = 16.0 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

774006.01 9/5/18 N:\PROJECTS\0774006.010.013.GPJ WELL LOG

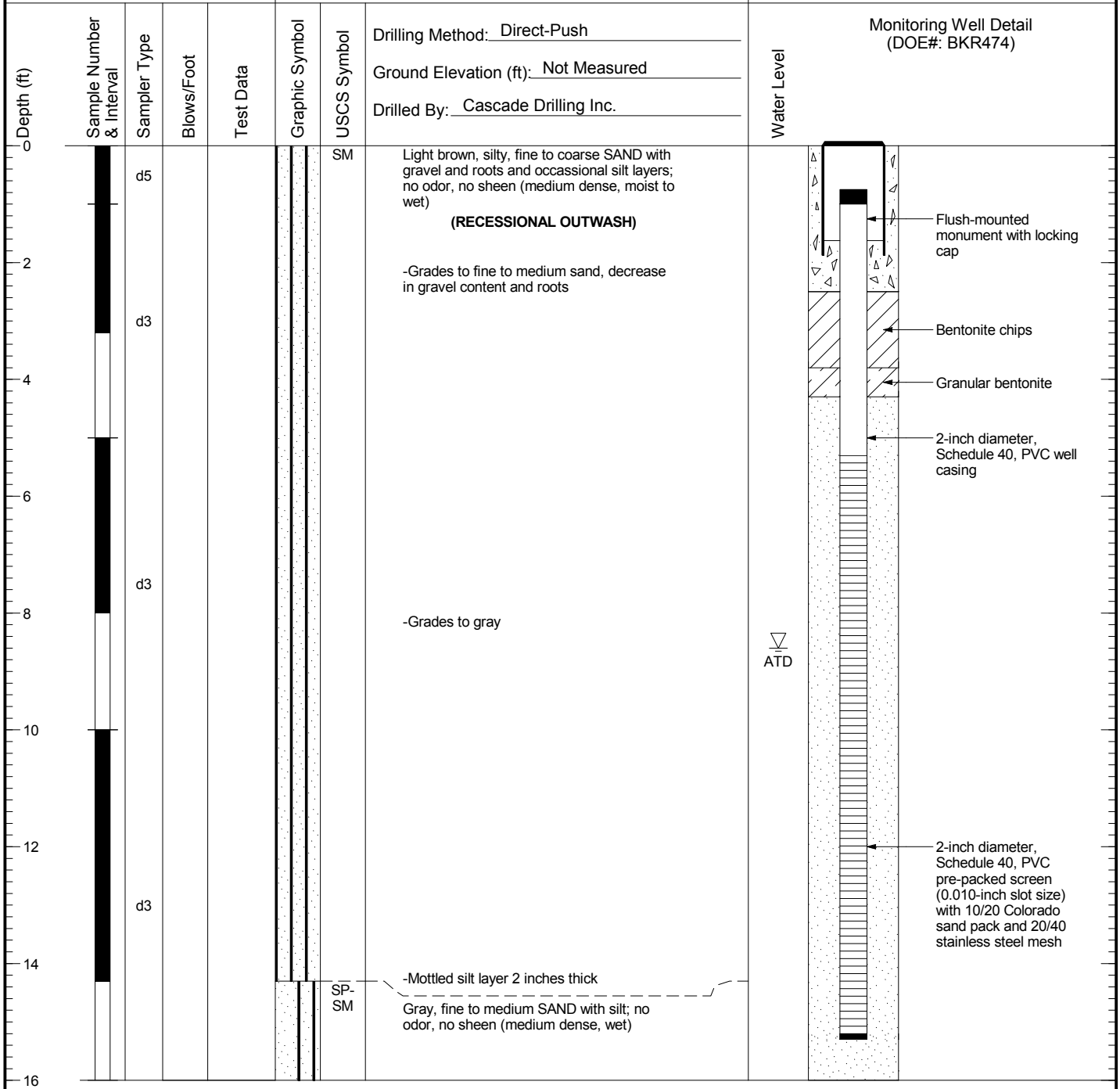
LANDAU ASSOCIATES

Webster Nursery
Olympia, Washington

Log of Monitoring Well SW-10R

Figure
B-

SW-11R



Boring Completed 08/16/18
Total Depth of Boring = 16.0 ft.

Monitoring Well Completed 08/16/18
Total Depth of Monitoring Well = 15.3 ft.

Notes:
1. Stratigraphic contacts are based on field interpretations and are approximate.
2. Reference to the text of this report is necessary for a proper understanding of subsurface conditions.
3. Refer to "Soil Classification System and Key" figure for explanation of graphics and symbols.

774006.01 9/5/18 N:\PROJECTS\0774006.010.013.GPJ WELL LOG

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Webster Nursery Olympia, Washington	Log of Monitoring Well SW-11R	Figure B-