

# Memo



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**To:** Steve Teel, LHG (Ecology)  
**From:** Hannah Morse, EIT and Chris Waldron, PE  
**Cc:** Jake Lund (City of Olympia), Laura Keehan (City of Olympia), Chance Asher (Ecology), and Jerome Lamibotte (Ecology)  
**Date:** July 25, 2023  
**Subject:** City of Olympia Solid Wood Incorporated Site  
Results of Soil and Sediment Samples Collected as Part of the Data Gaps Investigation

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This technical memorandum (memo) presents the results of additional supplemental soil and sediment sampling that was performed between November 2022 and April 2023 at the Solid Wood Incorporated Site (Site) located in Olympia, Washington (Figure 1). This sampling was conducted on behalf of the City of Olympia (City) under the Site's existing Agreed Order (No. DE-08-TCPSR-5415), in accordance with the Data Gaps Investigation Work Plan (PIONEER Technologies Corporation [PIONEER] 2022). The purpose of this sampling event was to address the data gaps identified in the Washington State Department of Ecology's (Ecology's) comments on the Remedial Investigation/Feasibility Study (RI/FS) submitted in October 2015.

*Note: This memo focused on summarizing field activities and providing a high-level overview of the analytical results associated with the Data Gaps Investigation at the Site. This data will be evaluated in further detail and combined with the historical dataset as part of the RI/FS Report.*

As part of the RI, soil, groundwater, surface water, and sediment investigations were performed at the Site to determine the nature and extent of contamination associated with historical operations. The RI/FS report, which is intended to provide sufficient information to enable the City and Ecology to select a final cleanup action for the Site, documents the investigations that were performed at the Site, evaluates the nature and extent of contamination, and presents cleanup action alternatives for the Site under the requirements of Models Toxics Control Act (MTCA) chapter 173-340-350 Washington Administrative Code (WAC) and the Sediment Management Standards (SMS) chapter 173-204 WAC.

In December 2021, the City and Ecology identified two additional data gaps that had not been addressed as part of the RI/FS. The data gaps included:

- Insufficient data were available to characterize the vertical extent of carcinogenic polycyclic aromatic hydrocarbons (cPAHs) in soil along the historical railroad right-of-way (ROW) and cPAHs in the historical oil stain area had not been fully characterized; and
- Insufficient data were available to define the nature and extent of sediment contamination south of West Bay Park, immediately downgradient of three existing historical outfalls and in the vicinity of historical log rafting activities.

This memo documents the sampling methodology, field observations, and analytical results associated with soil and sediment sampling conducted as part of the Data Gaps Investigation.

*Note: A cultural resources monitor (i.e., Aqua Terra Cultural Resource Consultants) was onsite during sampling and no cultural resources were found or disturbed.*

## **Supplemental Soil Investigation**

### ***Soil Collection***

Fifteen soil samples were collected and analyzed from 11 sample locations for cPAHs in accordance with the Data Gaps Investigation Work Plan.<sup>1</sup> All soil sample locations were co-located with historical soil sample collected as part of previous RI/FS investigations. Eleven of the samples were collected along the historical rail spur and four samples were collected in the former oil stain area (Figure 2). Two of the samples (i.e., SB29 and SB30) were collected on February 28, 2023, and the remaining soil samples were collected on April 10 and April 11, 2023.<sup>2</sup> Soil samples were collected using a Geoprobe mounted on a tractor. The stainless-steel core sampler was fitted with a disposable acetate sleeve for each sample run. Soil samples were collected continuously from the ground surface to the planned depth of the boring. The acetate sleeve was cut lengthwise and opened to allow for observations. All soil samples were inspected by the archeologist, and then logged on a soil boring log. Soil from the desired sample depth was then placed in the sample jars for analysis. All samples were placed in a cooler and held at approximately four degrees Celsius until they were received by the project laboratory.

### ***Soil Analytical Results***

Soil samples were delivered to Libby Environmental in Olympia, Washington for chemical analysis. All soil samples were analyzed for cPAHs (United States Environmental Protection Agency [EPA] Method 8270). Soil sample field notes are provided in Attachment 1. A summary of the soil sampling results is presented in Table 1 and Figure 2. The analytical laboratory reports are provided in Attachment 2. cPAHs were detected in three of the fifteen samples. All soil sample results were less than the MTCA Method A Cleanup Level (CUL) of 0.1 mg/kg).

## **Supplemental Sediment Investigation**

### ***Sediment Collection***

Twenty-two sediment samples were collected and analyzed in accordance with the Data Gaps Investigation Work Plan (Figure 3). Ten intertidal sediment samples were collected from five locations along the shoreline; two from each location (i.e., five surface samples [0.0 to 0.50 feet bgs] and five deeper samples [0.50 – 2.0 feet bgs]). Five subtidal (i.e., below the mean-low water [MLW] line) sediment surface samples (i.e., 0.0 – 0.50 feet bgs) were collected waterward of the intertidal samples.

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<sup>1</sup> The Data Gaps Investigation Work Plan identified 12 soil sampling locations; however, one location (i.e., SS-05) was not accessible at the time of sampling. The sample location was located on a steep slope and submerged under approximately two feet of water at the time of sampling (i.e., between April 10th and April 11th, 2023).

<sup>2</sup> During soil sampling on February 28, 2023, the archeologist on Site stopped work to investigate a potential shell midden observed in SB30 at approximately 12 – 15 feet below ground surface (bgs). Upon further investigation, the archeologist determined it was not a shell midden. After notifying all parties, the remaining soil sampling was scheduled for April.

Seven sediment samples were collected waterward of the shoreline from six sample locations one sample from each location, and two from SD72 (i.e., an original sample and a field duplicate sample; see Figure 4). These seven sediment samples were collected proximate to the location of historical, in-water log storage and handling activities. The sediment sample locations were determined using the following steps:

1. Sediment samples for sieve testing were collected from the BAZ at 20 locations (see Figure 3). Sediment was collected using a stainless-steel power grab sampler mounted on a vessel owned and operated by Gravity Marine Consulting (Gravity).
2. Once the grab sampler had been secured on the vessel, sediment was placed in a clean bowl and homogenized. Sediment was then carefully transferred to a standard, fine aggregate sieve set (i.e., 4.75 mm, 2.36 mm, 1.18 mm, 600 microns, 300 microns, 150 microns). Using a five-gallon bucket, water was slowly poured through the sieve set. This continued until rinse water passed through all sieves.
3. Sediment was given approximately five minutes to settle. Then the volume and percentage of wood debris was estimated.
4. After performing all 20 sieve tests, seven sediment samples were collected from the six locations with the highest percentage of wood debris by volume (see Figure 4).

Sediment samples were collected from the power grab sampler using a decontaminated shovel and homogenized in a clean five-gallon bucket. Approximately two gallons of sediment were distributed between two sediment bags for bioassays and additional sediment was placed into samples jars for analytical chemical analysis. After each sample was collected, all equipment (i.e., shovel, five-gallon buckets, sieves, and the power grab sampler) were decontaminated using a scrub brush, Alconox, and deionized water. All samples were placed in a cooler and held at approximately four degrees Celsius until delivery to the project laboratories.<sup>3</sup> In addition to Site sediment samples, two reference sediment samples were collected from reference sediment stations located in Carr Inlet by EcoAnalysts, Inc. Carr Inlet is considered a suitable reference area in the Puget Sound under the SMS. Sediment sample field notes are provided in Attachment 1. Photos of sediment samples and a summary of the estimated wood waste by volume associated with each of the 20 sieve samples are presented in Attachment 3.

## ***Sediment Test Results***

### ***Chemistry Testing***

Sediment samples were delivered to Libby Environmental in Olympia, Washington for chemical analysis. Intertidal and subtidal sediment samples were analyzed for the following:

- Volatile Organic Compounds (VOCs; EPA Method 8260D)
- Semi-Volatile Organic Compounds (sVOCs; EPA Method 8270)
- Polycyclic Aromatic Hydrocarbons (PAHs; EPA Method 8270)
- Metals (EPA Method 6010/6020)<sup>4,5</sup>
- Total Petroleum Hydrocarbons (TPHs; Method NWTPH-Gx and NWTPH-Dx)

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<sup>3</sup> Sediment samples for bioassays were sent to EcoAnalyst, Inc. in Port Gamble, WA. Sediment samples for chemistry analysis were sent to Libby Environmental in Olympia, WA.

<sup>4</sup> The metals were analyzed for arsenic, cadmium, chromium, copper, lead, mercury, silver, and zinc.

<sup>5</sup> Mercury was analyzed for using EPA Method 7471.

- Polychlorinated Biphenyls (PCBs; EPA Method 8082/1668)
- Phthalates (EPA Method 8270)
- Phenols (EPA Method 8151/2070)
- Dioxins/Furans (EPA Method 1613)
- Total Organic Carbon (EPA Method 9060A)
- Grain Size (PSEP 1995)

Sediment samples, collected in the approximate area of historical log rafting activities, were analyzed for the following:

- VOCs (EPA Method 8260D)
- sVOCs (EPA Method 8270)
- PAHs (EPA Method 8270)
- Metals (EPA Method 6010/6020)<sup>4,5</sup>
- TPHs (Method NWTPH-Gx and NWTPH-Dx)
- PCBs (EPA Method 8082/1668)
- Phthalates (EPA Method 8270)
- Phenols (EPA Method 8151/2070)
- Dioxins/Furans (EPA Method 1613)
- Ammonia (SM 4500-S2/4500-NH3)
- Total Volatile Solids (SM 2540E)
- Total Organic Carbon (EPA Method 9060A)
- Sulfides (Plumb 1981/SM 4500-S2/4500-NH3)
- Grain Size (PSEP 1995)
- pH (EPA Method 9045D)

A summary of the sediment sampling results is presented in Table 2. The analytical laboratory reports are provided in Attachment 2.

### *Biological Testing*

Sediment samples were shipped overnight to EcoAnalysts, Inc. in Port Gamble, Washington for bioassay testing.

Biological testing consisted of:

- 10-day amphipod solid phase survival test using *eohaustorius estuaries*;
- Sediment larval development test using *bivalve mytilus spp*; and
- 20-day polychaeta growth test using *neanthes arenaceodentata*.

The locations of sediment bioassays and results of the sieve testing associated with each location are shown on Figure 4. The results of the biological testing are presented in the EcoAnalysts, Inc. report provided in Attachment 4. Results were compared to the reference sediment sample results and the sediment cleanup objectives (SCO) and the cleanup screening levels (SCLs) presented in the Sediment Cleanup User's Manual (SCUM; Ecology 2021). The six Site sediment samples and the two reference samples from Carr Inlet passed the performance criteria for the three bioassay tests (Figure 4).



## Conclusions

Analytical results for cPAHs in soil were compared to the MTCA Method A CUL of 0.1 mg/kg. All concentrations were less than the MTCA Method A CUL.

Chemical and biological testing results for sediment samples were compared to the SMS criteria outlined in the SCUM guidance (Ecology 2021). All Analytical results, with the exception of a single exceedance for phenols in SD71 (see Table 2 and Figure 5), were less than SCO criteria, SCL criteria, and/or applicable screening levels (e.g., Ecology-derived TPH sediment screening level). All six subtidal sediment samples (including SD71 where the phenol exceedance occurred) passed all three bioassays.

The maximum detected cPAH sediment concentration (0.042 mg/kg-dry weight) was less than the Puget Sound Marine Sediment Natural Background Concentration (21 mg/kg-dry weight) and the South Puget Sound Regional Background Concentration (78 mg/kg-dry weight).<sup>6</sup> The maximum detected Total Dioxins/Furans (2,3,7,8-TCDD TEQs) sediment concentration (9.4 ng/kg-dry weight) exceeded the Puget Sound Marine Sediment Natural Background Concentration (4 ng/kg-dry weight) but was less than the South Puget Sound Regional Background Concentration (15 ng/kg-dry weight).<sup>7</sup>

Based on the results of the soil sampling, the vertical extent of cPAHs in soil is considered characterized and no further soil sampling is recommended as part of the RI/FS. Based on the results of the sediment sampling, the nature and extent of contamination in sediment south of West Bay Park is considered characterized and no further sediment sampling is recommended as part of the RI/FS.

## References

- Ecology. 2018. South Puget Sound Regional Background. Final Data Evaluation and Summary Report. May.
- Ecology. 2021. Sediment Cleanup User's Manual (SCUM). Guidance for Implementing the Cleanup Provisions of the Sediment Management Standards, Chapter 173-204 WAC. December.
- PIONEER. 2022. Data Gaps Investigation Work Plan - Solid Wood, Inc. Site RI/FS Report. August.

## Enclosures

Figure 1	Site Location
Figure 2	Soil cPAH Sample Locations
Figure 3	Sediment cPAH Sample Locations
Figure 4	Sediment Bioassay Locations and Results
Figure 5	Phenol Concentrations in Sediment
Table 1	Soil Sampling Results
Table 2	Sediment Sampling Results
Attachment 1	Sampling Field Notes
Attachment 2	Libby Environmental Analytical Laboratory Reports

<sup>6</sup> The maximum detected cPAH sediment concentration (0.042 mg/kg-dry weight) was less than the MTCA Method B Soil CUL, used only as a screening level for the purposes of this memo (0.1 mg/kg-dry weight).

<sup>7</sup> The maximum detected Total Dioxins/Furans (2,3,7,8-TCDD TEQs) sediment concentration (9.4 ng/kg-dry weight) was also less than the MTCA Method B Soil CUL, used as only as a screening level for the purposes of this memo (11 ng/kg-dry weight).

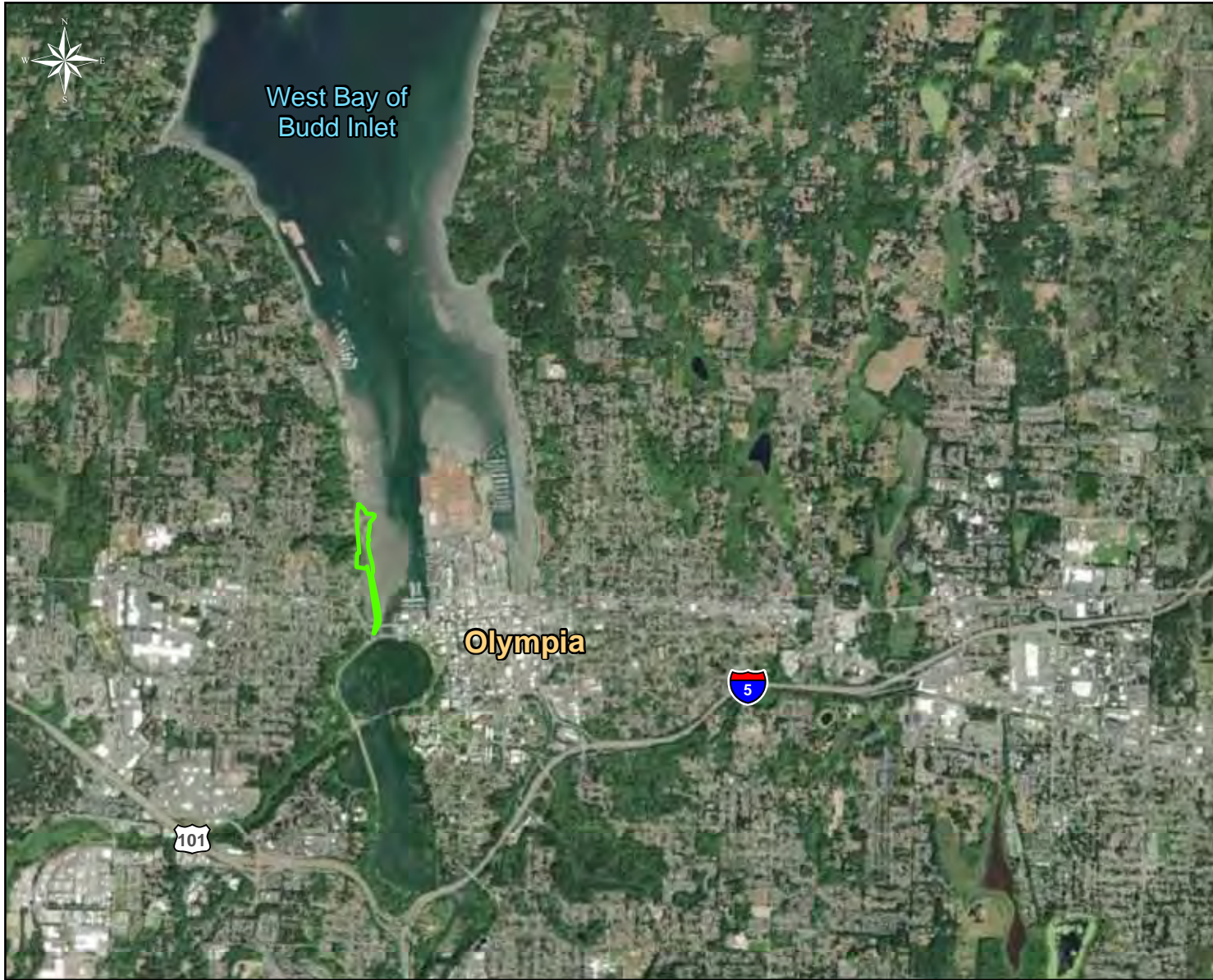
Attachment 3  
Attachment 4

Sediment Sampling Photo Log  
EcoAnalysts, Inc. Analytical Laboratory Report


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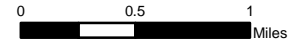
# Figures

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**Legend**

 Agreed Order Boundary



Site Location  
Data Gaps Investigation  
Solid Wood Incorporated Site  
Olympia, Washington

Figure 1





Soil CPAH Sample Locations  
Data Gaps Investigation  
Solid Wood Incorporated Site  
Olympia, Washington

Figure 2





**Legend**

- Agreed Order Boundary (DE-08-TCPSR-5415)
- RI/FS Sediment Sample Locations
- Approximate Location of Existing Outfalls

**Sediment Sample Locations**

- BAZ (0 - 0.5 ft. bgs)
- Subsurface (0.5 - 2.0 ft. bgs.)
- Locations for Field Sieve
- Locations sampled for SMS chemistry and bioassay testing



Sediment Sampling Locations  
Data Gaps Investigation  
Solid Wood Incorporated Site  
Olympia, Washington

Figure 3

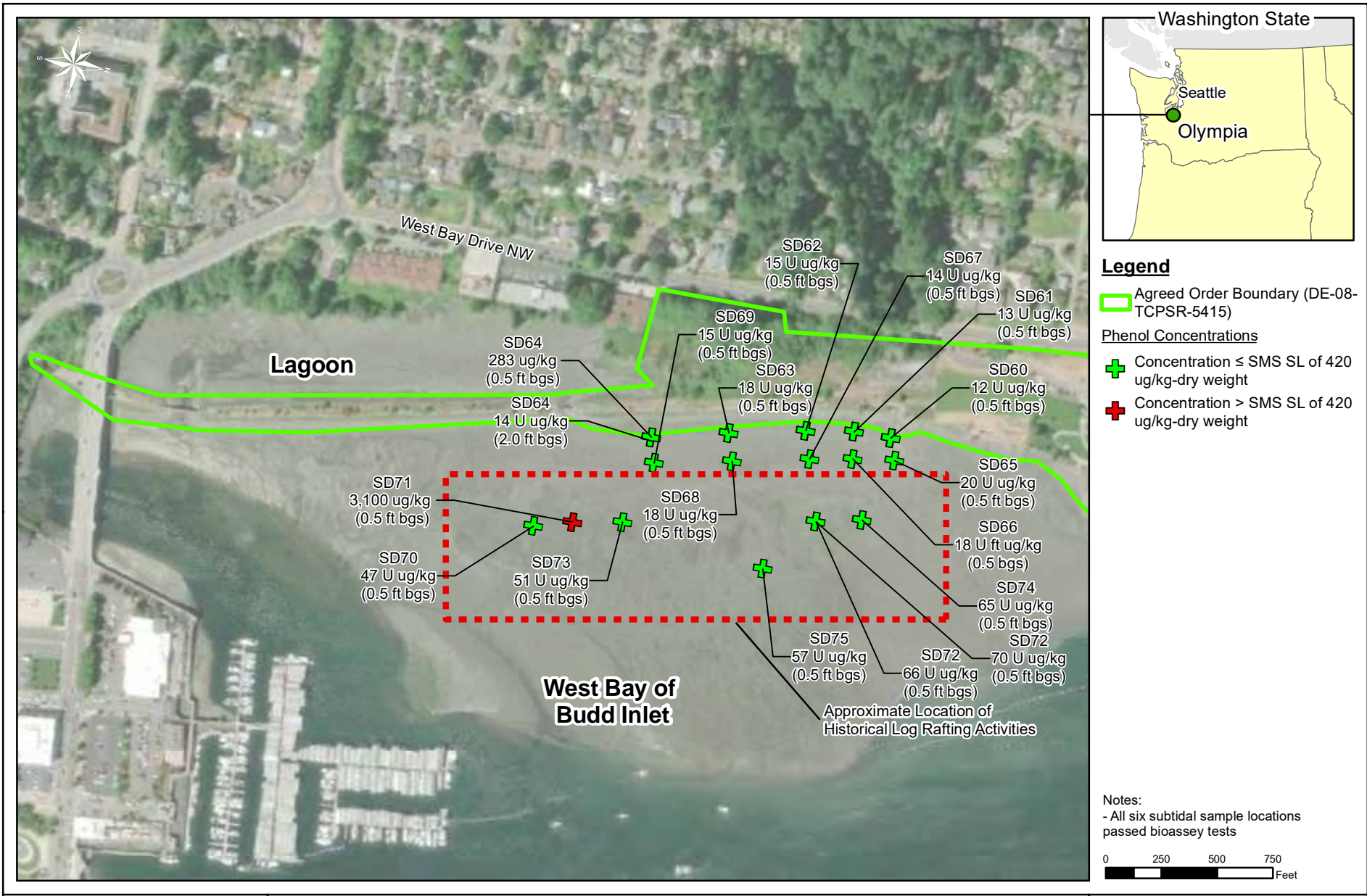


Sediment Bioassay Locations and Results  
Data Gaps Investigation  
Solid Wood Incorporated Site  
Olympia, Washington

Figure 4







Phenol Concentrations in Sediment  
Data Gaps Investigation  
Solid Wood Incorporated Site  
Olympia, Washington

Figure 5



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# Tables

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**Table 1: Soil Sampling Results**

Sample ID	Sample Depth (ft bgs)	cPAH Results (mg/kg)	Qualifier	Exceeds MTCA Method A CUL? <sup>1</sup>
WB-SO-SB26-0060	6.0	0.0020		No
WB-SO-SB29-0060	6.0	0.0093	U	No
WB-SO-SB30-0060	6.0	0.0077	U	No
WB-SO-SS01-0020	2.0	0.0081	U	No
WB-SO-SS02-0020	2.0	0.0076	U	No
WB-SO-SS03-0020	2.0	0.0079	U	No
WB-SO-SS04-0020	2.0	0.0085	U	No
WB-SO-SS06-0020	2.0	0.050		No
WB-SO-SS07-0020	2.0	0.0079	U	No
WB-SO-SS07-0060	6.0	0.0094	U	No
WB-SO-SS08-0020	2.0	0.0093	U	No
WB-SO-SS08-0060	6.0	0.0090	U	No
WB-SO-SS08-1060	6.0	0.0093	U	No
WB-SO-SS11-0020	2.0	0.0098	U	No
WB-SO-SS11-0060	6.0	0.0019		No

**Notes:**

<sup>1</sup> The MTCA Method A Cleanup Level (CUL) for cPAHs is 0.1 mg/kg.

Qualifiers:

Blank or No Qualifier cPAHs were Detected

U: cPAHs were Not Detected

bgs: below ground surface

cPAHs: carcinogenic polycyclic aromatic hydrocarbons

ft: feet

mg/kg: milligrams per kilogram



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**Table 2: Summary of Sediment Sampling Results**

Constituent	Number of Samples	Number of Detected Results	Frequency of Detection (%)	Maximum Detected Concentration (mg/kg)	Puget Sound Marine Sediment Natural Background <sup>1</sup>	South Puget Sound Regional Background <sup>2</sup>	Sediment Management Standards (WAC 173-204)		Does the Maximum Detected Concentration Exceed one of the Applicable Criteria? (Yes / No)
							SCO	CSL	
<b>Total Petroleum Hydrocarbons (mg/kg-dry weight)</b>									
TPH-D	22	0	0	--	-	-	--	--	No
TPH-HO	22	0	0	--	-	-	--	--	No
Total TPH (HO + Diesel)	22	0	0	--	-	-	100 <sup>3</sup>	--	No
<b>Metals (mg/kg dry-weight)</b>									
Arsenic	22	22	100	4.2	11	- <sup>4</sup>	57	93	No
Cadmium	22	22	100	1.2	0.8	-	5.1	6.7	No
Chromium, Total	22	22	100	45	62	-	260	270	No
Copper	22	22	100	57	45	-	390	390	No
Lead	22	22	100	23	21	-	450	530	No
Mercury	22	0	0	--	0.2	- <sup>4</sup>	0.41	0.59	No
Zinc	22	22	100	89	93	-	410	960	No
<b>SVOCs OC-Normalized (mg/kg-organic carbon)<sup>5</sup></b>									
2-Methylnaphthalene, OC-Normalized	22	1	5	0.65	-	-	38	64	No
Acenaphthene, OC-Normalized	22	1	5	0.46	-	-	16	57	No
Acenaphthylene, OC-Normalized	22	1	5	0.97	-	-	66	66	No
Anthracene, OC-Normalized	22	2	9	2.0	-	-	220	1,200	No
Benz[a]anthracene, OC-Normalized	22	18	82	2.6	-	-	110	270	No
Benzo(g,h,i)perylene, OC-Normalized	22	2	9	7.2	-	-	31	78	No
Benzo[a]pyrene, OC-Normalized	22	2	9	1.8	-	-	99	210	No
Benzo[b]fluoranthene, OC-Normalized	22	8	36	2.5	-	-	--	--	No
Benzo[k]fluoranthene, OC-Normalized	22	4	18	2.1	-	-	--	--	No
Bis(2-ethylhexyl)phthalate, OC-Normalized	22	4	18	3.4	-	-	47	78	No
Chrysene, OC-Normalized	22	14	64	4.9	-	-	110	460	No
Dibenz[a,h]anthracene, OC-Normalized	22	1	5	4.3	-	-	12	33	No

**Table 2: Summary of Sediment Sampling Results**

Constituent	Number of Samples	Number of Detected Results	Frequency of Detection (%)	Maximum Detected Concentration (mg/kg)	Puget Sound Marine Sediment Natural Background <sup>1</sup>	South Puget Sound Regional Background <sup>2</sup>	Sediment Management Standards (WAC 173-204)		Does the Maximum Detected Concentration Exceed one of the Applicable Criteria? (Yes / No)
							SCO	CSL	
Fluoranthene, OC-Normalized	22	22	100	6.2	-	-	160	1,200	No
Fluorene, OC-Normalized	22	2	9	0.70	-	-	23	79	No
Indeno[1,2,3-cd]pyrene, OC-Normalized	22	0	0	--	-	-	34	88	No
Naphthalene, OC-Normalized	22	5	23	7.1	-	-	99	170	No
Phenanthrene, OC-Normalized	22	14	64	3.6	-	-	100	480	No
Pyrene, OC-Normalized	22	1	5	5.4	-	-	1,000	1,400	No
Total Benzofluoranthenes, OC-Normalized	22	9	41	3.2	-	-	230	450	No
Total LPAH, OC-Normalized	22	14	64	13	-	-	370	780	No
Total HPAH, OC-Normalized	22	22	100	16	-	-	961	5,300	No
<b>Phenols (mg/kg-dry weight)</b>									
Phenol	22	2	9	3.10	-	-	0.42	1.2	Yes <sup>6</sup>
<b>Dioxins/Furans (ng/kg-dry weight)</b>									
Total Dioxins/Furans (2,3,7,8-TCDD TEQs) <sup>7</sup>	12	12	100	9.4	4	15	--	--	Exceeds Natural Background Concentration but is less than Regional Background Concentration
<b>Total Carcinogenic PAHS (mg/kg-dry weight)</b>									
Total Carcinogenic PAHS (BaP TEQs) <sup>7</sup>	22	19	86	0.042	21	78	--	--	No

**Notes:**

BaP: Benzo(a)pyrene

CSL: Cleanup Screening Level

OC: Organic Carbon

SCO: Sediment Cleanup Objective

TEQ: Toxic Equivalents

Shaded cells indicate that the maximum detected constituent concentration exceeds the applicable SL.

<sup>1</sup> Puget Sound Marine Sediment Natural Background concentrations were obtained from Table 10-1 of Ecology's SCUM Guidance (Ecology 2021) and Table 1 of the South Puget Sound Regional Background: Data Evaluation & Summary Report (Ecology 2018).

<sup>2</sup> South Puget Sound Regional Background concentrations were obtained from Table 10-2 of Ecology's SCUM Guidance (Ecology 2021) and Table 1 of the South Puget Sound Regional Background: Data Evaluation & Summary Report (Ecology 2018).

<sup>3</sup> The Ecology-derived TPH sediment screening level is applicable to the sum of TPH-D and TPH-HO results.

<sup>4</sup> There was insufficient data to establish regional background for this chemical (Ecology 2021).

<sup>5</sup> Constituents were organic carbon (OC) normalized by dividing the constituent concentration by the sample-specific total OC concentration.

<sup>6</sup> Sample #WB-SO-SD71-0005 exceeded both sediment management standards, but passed biological testing (bioassay).

<sup>7</sup> Total Dioxins/Furans (2,3,7,8-TCDD TEQs) and Total Carcinogenic PAHS (BaP TEQs) were calculated by multiplying the concentrations by toxicity equivalency factors (WAC 173-340-900 Table 708-1 and 708-2) and the summing all "TEQ" weighted concentrations. Half the reporting limit was used for non-detected results.

# **Attachment 1**

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# PIONEER DAILY FIELD REPORT

Date: \_\_\_\_\_ Site Location: West Bay, 014 WA Site Arrival Time: 9:30 Site Departure Time: \_\_\_\_\_

WEATHER  
TEMPERATURE  
WIND

Clear Sky	Overcast	Drizzle	Rain	Snow
10-32	32-50	50-70	70-85	Its Up
Calm	Mild	Strong	Severe	

PEOPLE PRESENT ON SITE

NAME	ASSOCIATION	TIME ON SITE AND OFF SITE
HM Logan Berke Cam	PTC gravity ↓ Aqua Terra	

NOTES ON WORK COMPLETED

sample 10: 5060 7.8 FT  
 1145 (WIN: Grab #1)  
 No odor. Sand material. Very thick. No wood debris.  
 Very dense. Brown in color. Worms. No shells.

2 FT = 7.9 FT  
 1210 Reject Grab #1. Lost volume of sed. Not enough  
 to samp. Reject Grab #2. Too many shells.  
 move 5' off location due to large volume of rock  
 and shells. Hardly any sediment in 4 attempts.  
 Blackish. Sandy. Very Dense/compacted.  
 Large volume shells/debris.

1061 6.0 FT WIN: Grab #1 High Vol Wood Debris  
 1242 PM

2 FT (1310) 5.6 FT Reject Grab #1 Too many rocks.  
 Tree log bark  
 6.4 FT. Moved due to low depth.  
 Stay around 6 FT prevent wave influence.

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_



# PIONEER DAILY FIELD REPORT

Lunch @ 9 AM

Date 11/28 Site Location: West Bay Site Arrival Time: 8:30 Site Departure Time: \_\_\_\_\_

WEATHER  
TEMPERATURE  
WIND

Clear/Sun	Cloudy/Part	Breeze	RAIN	SNOW
10-32	52-58	50-70	70-85	85 UP
Calm	Mild	Strong	Severe	

PEOPLE PRESENT ON SITE

NAME	ASSOCIATION	TIME ON SITE AND OFF SITE
Hannah M.	PTC	8:30 - 4 PM
Loan	Gravity	↓
Derek	" "	
Caru	Aqua Terra	

NOTES ON WORK COMPLETED

Sample ID: SD69 (6 IN) 9:30 AM 13 FT (Depth of Water)  
 Comments: No odor 1 inch soft / saturated red brown  
 bottom layer was darker, dense  
 shells present. No wood debris. 1st Grab

Sample ID: SD68 (6 IN) 9:55 AM 12.9 FT  
 Comments: 1st Grab Faint odor - rotten egg like  
 seaweed, shells present. soft top inch, then more dense,  
 thick. shells present 7.2" No wood debris present.  
 sandy

Sample ID: SD67 (6 IN) 10:15 AM 13.2 FT  
 Comments: 1st Grab. No shells. vegetation - unknown.  
 Very fine. top 1-2" soft, next 2-3" thick, dense, dark  
 No odor. No wood debris. (Black-ish)  
 Ran through No. 20 sieve. No sign wood debris  
 or biological species.

Sample ID: SD66 (6 IN) 10:45 AM 12.7 FT  
 Comments: 1st grab. very fine, soft material. No odor.  
 sieved - only small rocks retained.  
 No shells / vegetation. Brown in color. No wood waste.

Sample ID: SD65 (6 IN) 11:05 AM 11.5 FT  
 Comments: Rejected Grab #1. Not enough in 1st bucket  
 to fill camp containers.  
 Grab #2 successful. Reject Grab #2. Barely any  
 sediment. Large rocks / shells. ~~no~~ small ~~of~~ crabs / insects.  
 move approx 5' off current location. 12.7 FT.

11:30 AM No odor. Shells Present.

SIGNATURE Am

DATE 11/28



# PIONEER DAILY FIELD REPORT

Date: 11/29/2022 Site Location: solid wood Site Arrival Time: 8:00 Site Departure Time: \_\_\_\_\_

WEATHER  
TEMPERATURE  
WIND

Clear/Sky	Overcast	Dust/Smoke	Rain	<u>Show</u>
<u>75-72</u>	<u>32-30</u>	50-70	70-85	85-100
Light	Med	Strong	Severe	

PEOPLE PRESENT ON SITE

8 AM 30°F BY 10 AM 33-34°F HIGH 37°F  
NAME ASSOCIATION

TIME IN SITE AND OFF SITE


NOTES ON WORK COMPLETED

Sample ID: SD64 75'

most < 5%  
Some as > 30% (w/ or 2)

6 IN 0930 Comments Grab #1

Large Rock, Shell

Large Piece of wood - no small debris

Blackish-dense sand no odor

2 FT 0955 Comments: 0.9 FT

No rock/shells.

Small amount of fine wood debris (in centralized loc)

Before/After photos

~~Sieve #1~~

No. 200 No 10

< 5% Sieve #06 12.6 FT 0923

No odor sandy w/ silt/clay underneath.

< 5% by volume wood waste

One ~~small~~ chunk of wood. Some wood - difficult to differentiate between wood/vegetation

~10% Sieve ~~#02~~ 12.1 FT 0938

#02

No odor. ~~sandy~~ silty material - very fine could not pass through No. 200 sieve

~10-12.5% wood waste. Very fine/broken up

w/ shells and other organic matter

large volume of shells crab present.

sand top 1"

then silt/clay

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_

PRMP  
Loc.

# PIONEER DAILY FIELD REPORT

Date: 11/29 Site Location: Solid Wood Site Arrival Time: 8 AM Site Departure Time: \_\_\_\_\_

WEATHER  
TEMPERATURE  
WIND

Clear Sun	Overcast	Light	Rain	Snow
10-32	32-50	50-70	70-85	85 Up
Calm	Mod	Strong	Severe	

PEOPLE PRESENT ON SITE

NAME	ASSOCIATION	TIME ON SITE AND OFF SITE

6 IN DEPTH

NOTES ON WORK COMPLETED

Sieve No. 4 1000 AM 12.2 FT  
 0-12% Odor - organic matter.  
 Wood waste

Sieve #07 1010 AM 12.7 FT.  
 10% wood waste wood chips, large debris, limited shell.  
 No odor.

Sieve No. 03 1030 AM 13.1 FT  
 No odor. No large debris. Fine organic matter.  
 Mostly mixed w/ shell

Sieve No. 20 1042 12.9 FT  
 < 5% very little wood waste.  
 (1-2%) very silty ~~very~~ very little shell.  
 No odor. Greyish Brown. Benic

Sieve No. 68 1100 13.1 FT  
 broken shell. No odor. ~~very~~  
 (< 5%) very fine, no vegetation/organic matter.  
 3-4 1/2% fine material, easily broken

Sieve No. 01 1114 13.6 FT  
 10-15% No odor. Large number of wood. 2" of soft sandy mat  
 Fragile. Large Volume of shells. then dense silt/Clay

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_



# PIONEER DAILY FIELD REPORT

Date \_\_\_\_\_ Site Location \_\_\_\_\_ Site Arrival Time \_\_\_\_\_ Site Departure Time \_\_\_\_\_

WEATHER  
TEMPERATURE  
WIND

Direction	Speed	Direction	Speed	Direction	Speed
10-20	22-30	30-40	10-25	10-25	10-25
Calm	Med	Strong	Severe		

PEOPLE PRESENT ON SITE = 7 HR \* COLD ON/OFF SNOW  
 NAME: \_\_\_\_\_ NO WIND ASSOCIATION: \_\_\_\_\_ TIME ON SITE AND OFF SITE: \_\_\_\_\_

\* 2+ HOURS TO  
SIEVE THROUGH

PHASED APP.

~~1137~~ #50

~~1137~~ #10

#4

\* HARD TO  
DEF. CR. MATTER

IF LG  
PIECES

2 HR PDE	VERY LIMITED MVMNT ON BOAT
1 HR PDE	
1 HR PDE	

NOTES ON WORK COMPLETED \* (DEPTH) AS SHALLOW - SAMP DURING HIGH TIDE

1137  
10%  
SIEVE NO. 9 14.3 FT (DEPTH OF WATER)

Higher volume due to Lg pieces. Very little  
Fines/Broken Mat. Strong Odor

1-2) SIEVE NO. 10 14.6 FT 1145  
No large chunks. Sandy top w/ layer of silt below  
very mostly fine grained. ~~Strong odor~~

< 1) Sieve No. 14 14.6 FT 1200  
No large debris. ~~SE~~ No odor.  
Very little fines. If any hard to  
tell, assumed wood waste.

2-3) SIEVE NO. 18 1210 14.0 FT  
Silt. Fine wood debris. No large  
pieces. No odor. Brown 1" then Black/dense  
beneath.

25% SIEVE NO. 16 1220 12.9 FT  
~~Strong odor~~ No shells. Sand 1" followed by silt.

20% SIEVE NO. 17 1235 @ 11.7 FT  
No odor. Silt. Brown. No large pieces.

SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_

# PIONEER DAILY FIELD REPORT

Date: 11/29/07 Site Location: West Bay Site Arrival Time: 0800 Site Departure Time: 1400

WEATHER  
TEMPERATURE  
WIND

Clear Sky	Overcast	Drizzle	Rain	Snow
10-32	32-50	50-70	70-85	85-100
Calm	Med	Strong	Severe	

PEOPLE PRESENT ON SITE

NAME	ASSOCIATION	TIME ON SITE AND OFF-SITE

NOTES ON WORK COMPLETED

sample ID: SD62 (6 IN)  
 - Reposition approx 2' west due to water level  
 Time: 1340 Depth = 5.4 ft  
 Thick, dense silt w/ sandy material  
 No debris/shells No odor.

SD62 (2 FT) Depth = 5.7 FT Time: 1405  
 Homogenous. No debris. No shells. Dense sandy followed  
 by silty material.  
 No odor. Black in color.

sample ID: SD63 Depth = 5.6 ft Time = 1430  
 plant roots, slight odor after ~ 2". Dark brown w/  
 black spots, loose sand/silt matrl. No debris.

SD63 (Depth = 4.8 FT) Time = 1445  
 (2 FT) very small amount of wood debris, isolated  
 to one location. Fine material. Faint odor.

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_



# PIONEER DAILY FIELD REPORT

Date 11/30/2022 Site Location West Bay Site Arrival Time 0800 Site Departure Time 1300

WEATHER  
TEMPERATURE  
WIND

Clear Sky	Overcast	Drizzle	Hail	Snow
10-32	32-50	30-70	70-85	45-60
Light	Med	Strong	Severe	

PEOPLE PRESENT ON SITE

NAME	ASSOCIATION	TIME ON SITE AND OFF-SITE

NOTES ON WORK COMPLETED

Top 1/2 by wood waste

SIEVE # 2 ( ) = SD70

SIEVE # 4 (~10%) = SD71

SIEVE # 1 (20%) = SD72 + Duplicate

SIEVE # 7 (10%) = SD73

SIEVE # 9 (10-15%) = SD74

SIEVE # 17 (~10%) = SD75

---

Sieve #2 (SD70) Depth=8.6 FT Time=0830  
 Grab #1 (Bioassay)  
 Grab #2 (sediment chemistry samples)

---

Sieve #4 (SD71) Depth=10 ft Time=0905  
 Grab #1 (Bioassay)  
 Grab #2 (chemistry data)

---

Sieve #7 (SD73) Depth=10.6 FT Time=~~1025~~ 0935  
 Grab #1 (Bioassay + chemistry data)  
~~Grab #2 (Duplicate chemistry data)~~

---

Sieve #1 (SD72) Depth=11.4 ft Time=10:25  
 Grab #1 (Bioassay + chemistry data)  
 Grab #2 (duplicate chemistry data)

---

Sieve #9 (SD74) Depth=15.6 Time=1115  
 Grab #1 (Bioassay + chemistry data)

---

Sieve #17 (SD75) Depth=14.7 ft Time=1145  
 Grab #1 (Bioassay + chemistry data)

SIGNATURE \_\_\_\_\_ DATE: \_\_\_\_\_

# PIONEER DAILY FIELD REPORT

HIGHEST  
1, 4, 7, 7, 2, 17

Date: \_\_\_\_\_ Site Location: \_\_\_\_\_ Site Arrival Time: \_\_\_\_\_ Site Departure Time: \_\_\_\_\_

WEATHER  
TEMPERATURE  
WIND

CLEAR SUN	TEMPERATURE	WIND DIRECTION	WIND SPEED	MOON
16-32	37-50	50-70	70-85	85 UP
Light	Med	Strong	Severe	

PEOPLE PRESENT ON SITE

NAME	ASSOCIATION	TIME ON SITE AND OFF SITE

NOTES ON WORK COMPLETED

SIEVE NO. 12 1250 11.2 FT (DEPTH OF H<sub>2</sub>O)

(~2%) Silt w/ Limited Shell.  
Vegetation (Leaves, Roots,)  
No odor.

SIEVE NO. 11 1300 11.0 FT

\* No odor. Shell/debris. Silt w/ sand  
3-11%

SIEVE NO. 15 10.6 FT 1315

5% Shells. Med chips. More like Bark chips/mulch.  
Silt.

SIEVE NO. 14 1325 ~~1315~~ 9.9 FT

~~Project~~ <sup>place</sup> ~~grab #1. Taken at WRONG depth~~  
& most sediment was lost Not enough to samp.  
5-10% Shell chips Strong Odor

SIEVE NO. 13 1340 10.1

Lot of Shell. No large wood.  
No odor

limited sediment  
multiple  
grabs

5-10%

SIEVE NO. 05 10 FT 1350

<1% All shell. No signs of wood.  
Sandy.

SIGNATURE \_\_\_\_\_

DATE \_\_\_\_\_





PIONEER  
TECHNOLOGICAL CORPORATION

Project No.                       
Project Name: SAUNDANOD  
Location: OLY, WA  
Drilling Date(s): 01/28-03/01 Client: CITY OF OLY  
Drilling Company: HAINTERE Field rep: HMP/H  
Sampling Method/equipment: GEOPROBE Rig No: TRAITOR Driller(s):                     

# Subsurface Sampling Field Log

(Applicable for direct-push Geoprobex, hand augers, and test pits)

Sampling Location ID: SP21

### Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1	<del>1.5</del>	<del>0-1</del>	<del>31</del>
2	<del>1.5</del>	<del>1-2</del>	<del>31</del>
3	<del>1.5</del>	<del>2-3</del>	<del>48</del>
4	<del>1.5</del>	<del>3-4</del>	<del>48</del>
5	<del>1.5</del>	<del>4-5</del>	<del>48</del>
6	<del>1.5</del>	<del>5-6</del>	<del>48</del>

### PID Screening

Depth (ft.)	Result (ppm)
1	<del>                    </del>
3	<del>                    </del>
5	<del>                    </del>
7	<del>                    </del>
9	<del>                    </del>
11	<del>                    </del>
13	<del>                    </del>
15	<del>                    </del>

### Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description <small>(draw horizontal line breaks between units) (Indicate all depths, in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL-")</small>	Symbol <small>(e.g. SP, CL, SM, etc.)</small>	Remarks <small>(include specific depth of observation; note staining, odors, etc. in this column)</small>
0-0.2	TOP SOIL		
0.2-6.0	FILL - SILTY SAND w/ gravel, grey, moist		
6.0-7.5	FILL - WOOD		
7.5-8.5	FILL - F-C SILTY SAND, brown, wet		
8.5-10.5	FILL - F-C SILTY SAND w/ shells, grey, wet		
10.5-12	F-C SILTY SAND w/ shell, grey, wet		

END OF BORING DEPTH: 12'  
GROUNDWATER DEPTH DURING DRILLING: 5.0 AFTER:                     

### Soil Analytical Sample(s)

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #
1FT		9:27		
12FT		9:28		

### GROUNDWATER Analytical Sample(s)

Screen Interval (ft. - ft.)	Time	Dup #	Remarks <small>(e.g. odors, arsen, silty, filtered metal/PAHs, etc.)</small>

Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc.)





P T E  
TECHNOLOGICAL CORPORATION

Project No: 1834  
Project Name: Solid Road  
Location: OLY, WA  
Drilling Date(s): 02/28-03/01  
Drilling Company: HAINGER  
Client: City of Oly  
Sampling Method/Equipment: GEOPROBE  
Field rep: \_\_\_\_\_  
Rig No: Tractor  
Driller(s): \_\_\_\_\_

# Subsurface Sampling Field Log

(Applicable for direct-push Geoprobe, hand augers, and test pits)

Sampling Location ID: SB30

Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1	4	0-4	27 3/4
2	4	4-8	26
3	4	8-12	30
4			
5			
6			

PID Screening N/A

Depth (ft.)	Result (pH)
1	
3	
5	
7	
9	
11	
13	
15	

SOIL Analytical Samples)

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #
0-4 FT		0836		
4-8 FT		0836		
8-12 FT		0836		

Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description (draw horizontal line breaks between units) (Indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL")	Symbol (e.g. SP, CL, SM, etc.)	Remarks (include specific depth of observation, note staining, odors etc. in this column)
0-0.2	TOP SOIL		
0.2-5.0	FILL - SILTY SAND w/ GRAVEL (25-30%), grey, moist		
5.0-6.0	FILL - F-C SILTY SAND, brown, moist		
6.0-8.0	FILL - F-C SILTY SAND w/ shells, grey, moist		
8.0-9.5	W/ LAYER SILT, grey, wet		
9.5-11.0	F-C SILTY SAND w/ shells, grey, wet		
11.0-11.8	SANDY SILT, grey, wet		
11.8-12	F-C SILTY SAND w/ shells, grey, wet		

END OF BORING DEPTH: 12  
GROUNDWATER DEPTH DURING DRILLING: 8.0 AFTER: \_\_\_\_\_

GROUNDWATER Analytical Samples)

Screen Interval (ft. - ft.)	Time	Dup #	Remarks (e.g. odors, sheen, silty, filtered metals/PATs, etc)

Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc):  
Refilled at 2 FT, and offset to 1 FT SW





P I O N E E R  
THE PIONEER CORPORATION

Project No. \_\_\_\_\_  
Project Name WATER MAIN  
Location 014, 104  
Drilling Dates 04/28-02/01 Client CITY OF OLY  
Drilling Company MANCINI Field rep HM/SH  
Sampling Method/Equipment GEOPROBE Rig No. \_\_\_\_\_  
Driller(s) DON TYLER

# Subsurface Sampling Field Log

(applicable for direct-push Geoprobe, hand augers, and test pits)

Sampling Location ID: SB26

### Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1	4	0-5	25
2	5	5-10	25
3	10	10-15	25
4			
5			
6			

### PID Screening N/A

Depth (ft.)	Result (ppm)
1	
3	
5	
7	
9	
11	
13	
15	

### SOIL Analytical Samples

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #
0-5		9:05		
5-10		9:05		
10-15				

### Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description <small>(draw horizontal line breaks between units) (indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL")</small>	Symbol <small>(e.g. SP, CL, SM, etc)</small>	Remarks <small>(include specific depth of observation, node staining, colors, etc. in this column)</small>
0-0.75	TOP SOIL		
0.75-5	FILL - SAND W/ GRAVEL, GREY, MOIST		
5-9.75	CLAYEY SILT W/ GRAVEL, GREY, WET		
9.75-10	FC SILTY SAND W/ GRAVEL FLAKES/DETRIT		
10-11.5	CLAYEY SILT GREY W/ FT		
11.5-12	SILTY GRAVEL W/ SAND, GREY W/ FT		

END OF BORING DEPTH: 12'  
GROUNDWATER DEPTH DURING DRILLING: 4.15 AFTER: \_\_\_\_\_

### GROUNDWATER Analytical Samples

Screen Interval (ft. - ft.)	Time	Dup #	Remarks <small>(e.g. odors, sheen, silty, filtered metals/PARTS, etc)</small>

### Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc.)  
POOR RECOVERY < 5 IN  
~ 0.75 FT 2' W/ FT



P.T.C. ENGINEERING CORPORATION

Project No. 5508

Project Name: Gold Wood

Location: City, WA

Client: City of City

Field rep

Rig No. 111111

Driller(s)

Sampling Location ID: 5508

Drilling Date(s): 06/25-08/01

Drilling Company: LANDMARK

Sampling Method/Equipment: GEOPROBE

Drillers(s)

Sampling Location ID: 5508

(Applicable for direct-push Geoprobos, hand augers, and test pits)

Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1	5	0-5	5FT
2	1	5-10	30
3	1	10-15	18
4			
5			
6			

P10 Screening

Depth (ft.)	Result (ppm)
1	X
3	X
5	X
7	X
9	X
11	X
13	X
15	X

SOIL Analytical Samples

Sample Interval	Basic Soil Type	Time	Weight for Moth (g)	Dup #
0 FT - 50		1200	/	/
50 FT - 100		1200	/	/

GROUNDWATER Analytical Samples

Screen Interval (ft. - ft.)	Time	Dup #	Remarks (e.g. odors, sheen, silty, filtered metal/Pb/Hg, etc.)

Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description (draw horizontal line breaks between units) (Indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL-")	Symbol (e.g. Sp, CL, SM, etc.)	Remarks (include specific depth of observation, note staining, odors, etc. in this column)
0.0-0.2	TOP FILL		
0.2-4.15	FILL - SILTY SAND w/ gravel, grey, moist		
4.15-5.75	WOOD		
5.75-6.5	FILL F-C SILTY SAND, brown, wet		
6.5-8.5	FILL F-C SILTY SAND w/ gravel, grey, wet shells		
8.5-10	ST. CLAYEY SILT, GREY, WET		
10.5-12	F-C SILTY SAND w/ shells, grey, wet		

END OF BORING DEPTH: 15'  
GROUNDWATER DEPTH DURING DRILLING: 4.5' AFTER:

Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc.)





PROJECTS  
LITHOLOGICAL CORPORATION

Project No: \_\_\_\_\_  
Project Name: SOLID WOOD  
Location: OLY, WA  
Drilling Date(s): 01/28 - 02/01 Client: City of Oly  
Drilling Company: Halverson Field rep: \_\_\_\_\_  
Sampling Method/Equipment: \_\_\_\_\_

Rig No: \_\_\_\_\_ Driller(s): \_\_\_\_\_  
Soil Profile/Lithology (include thickness of surfacing material): \_\_\_\_\_  
Sampling Location ID: 55-11  
(applicable for direct-push Geoprobe, hand augers, and test pits)

# Subsurface Sampling Field Log

### Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1	0	0-5	
2	5	6-10	
3	5	10-15	
4			
5			
6			

### PID Screening (M)

Depth (ft.)	Result (ppm)
1	
3	
5	
7	
9	
11	
13	
15	

### SOIL Analytical Samples

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #
2		1000		
6		1000		
12		1000		

### GROUNDWATER Analytical Samples

Screen Interval (ft. - ft.)	Time	Dup #	Remarks (e.g. odors, sheen, silty, filtered metal/PAHs, etc.)

Interval (ft. - ft.)	Description (draw horizontal line through breaks between units) (Indicate all depths in feet, e.g. 0 instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL.")	Symbol (e.g. SP, CL, SM, etc.)	Remarks (include specific depth of observation, note staining, odors, etc. in this column)
0-0.5	TOP SOIL		
0.5-3.0	GILTY SAND AND GRAVEL, grey, moist		
3-7	PETE W/ WOOD, BROWN, MOIST		
7-10	SAND + PETE, BROWN, WET		
10-10.5	SILTY SAND W/ GRAVEL, WET		
10.5-11.5	CLAYEY SILT, GREY, WET		
11.5-12	FC SILTY SAND w/ shell, grey, wet		

END OF BORING DEPTH: 12

GROUNDWATER DEPTH DURING DRILLING: \_\_\_\_\_ AFTER: \_\_\_\_\_

alternating layers w/ clayey silt

Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc.)



PT SERVICES CORPORATION

Project No: 1012 Wood

Project Name: 1012 Wood

Location: Ally WA

Client: City of Ally

Field rep: Halpern

Drilling Date(s): 5/18-02/10

Drilling Company: Halpern

Field No: \_\_\_\_\_

Rig No: \_\_\_\_\_

Driller(s): \_\_\_\_\_

Sampling Location ID: SS07

# Subsurface Sampling Field Log

(applicable for direct-push Geoprobe®, hand augers, and test pits)

### Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (%)
1	5	0-5	18
2	5	5-10	40
3	5	10-15	17
4			
5			
6			

### PID Screening

N/A

Depth (ft.)	Result (ppm)
1	
3	
5	
7	
9	
11	
13	
15	

### SOIL Analytical Sample(s)

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #
2	W	10:30		
4	W	11:20		
10	W	10:30		

### GROUNDWATER Analytical Sample(s)

Screen Interval (ft. - ft.)	Time	Dup #	Remarks (e.g. odors, sheen, silty, filtered metals/PATs, etc)

### Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description (draw horizontal line breaks between units) (indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL")	Symbol (e.g. SP, CL, SM, etc)	Remarks (include specific depth of observation, note staining, odors, etc. in this column)
0-0.5	TOP SOIL		
0.5-4	FINE SILTY SAND w/ GRAVEL, BROWN, MOIST		
4-10	FC SILTY SAND Trace GRAVEL, GRAY, WET		
10-15	CLAYEY SILT, BROWN, WET		

END OF BORING DEPTH: 12

GROUNDWATER DEPTH DURING DRILLING: 4 AFTER: \_\_\_\_\_

Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc.)











PROJECTS CORPORATION  
TECHNOLOGICAL CORPORATION

Project No: \_\_\_\_\_  
 Project Name: Solid Wood  
 Location: Aly WA  
 Drilling Date(s): 02/28-03/01 Client: City of Aly  
 Drilling Company: HARRISON Field rep: \_\_\_\_\_  
 Sampling Method/Equipment: \_\_\_\_\_  
 Rig No: \_\_\_\_\_  
 Drillers: DON TYLER

*WASH CONC*

# Subsurface Sampling Field Log

(applicable for direct-push Geoprobos, hand augers, and test pits)

Sampling Location ID: 4501

Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1			
2			
3			
4			
5			
6			

PID Screening N/A

Depth (ft.)	Result (ppm)
1	
3	
5	
7	
9	
11	
13	
15	

SOIL Analytical Sample(s)

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #

Soil Profile/Lithology (include thickness of surfacing material) POST HOLE DIGGER

Interval (ft. - ft.)	Description <small>(draw horizontal line breaks between units) (indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL")</small>	Symbol <small>(e.g. SP, CL, SM, etc)</small>	Remarks <small>(include specific depth of observation; note staining, odors, etc. in this column)</small>
0-0.10	TOP SOIL		
0.1-2.0	WASH FILL SAND AND GRAVEL, BROWN MOIST		
END OF BORING DEPTH: <u>2 FT</u> GROUNDWATER DEPTH DURING DRILLING: <u>N/A</u> AFTER: _____			

GROUNDWATER Analytical Sample(s)

Screen Interval (ft. - ft.)	Time	Dup #	Remarks <small>(e.g. odors, sheen, silty, filtered metallic/PATs, etc)</small>

Borehole Backfill: benzoinite NATIVE WASTEWATER

General Notes: (e.g. notes about location, site conditions, etc):



PROFESSIONAL CORPORATION

Project Name: WILD WOOD

Location: OLY, WA

Drilling Date(s): 02/28-02/01 Client: CITY OF OLY

Drilling Company: HAYWARD Field rep: \_\_\_\_\_

Rig No. \_\_\_\_\_

Driller(s): \_\_\_\_\_

# Subsurface Sampling Field Log

(applicable for direct-push Geoprobe, hand augers, and test pits)

Sampling Location ID: ~~SS04~~

SS04

### Soil Collection and Recovery

Sampler No.	Tool Length (ft.)	Actual Advanced Interval (ft. - ft.)	Recovery (in.)
1			
2			
3			
4			
5			
6			

### PID Screening N/A

Depth (ft.)	Result (ppm)
1	---
3	---
5	---
7	---
9	---
11	---
13	---
15	---

### SOIL Analytical Sample(s)

Sample Interval	Basic Soil Type	Time	Weight for Meth (g)	Dup #

### Soil Profile/Lithology (include thickness of surfacing material)

Interval (ft. - ft.)	Description <small>(draw horizontal line breaks between units) (indicate all depths in feet, e.g. instead of 11 inches, write 0.92 ft.) (For fill, qualify the description with the prefix "FILL.")</small>	Symbol <small>(e.g. SP, CL, SM, etc.)</small>	Remarks <small>(include specific depth of observation, note staining, odors etc. in this column)</small>
0.0-0.1	TOP SOIL		
0.1-2.0	FILL - GRAVEL W/ SAND, DROWN, MOIST		

END OF BORING DEPTH: 0 FT

AFTER: \_\_\_\_\_

### GROUNDWATER Analytical Sample(s)

Screen Interval (ft. - ft.)	Time	# Dup	Remarks <small>(e.g. odors, sheen, silty, filtered metals/PbAs, etc.)</small>

Borehole Backfill: bentonite

General Notes: (e.g. notes about location, site conditions, etc.)

\_\_\_\_\_

# **Attachment 2**



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# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

Phone (360) 352-2110 • libbyenv@gmail.com

April 18, 2023

Hannah Morse  
Pioneer Technologies Corporation  
5205 Corporate Center Court SE, Suite A  
Olympia, WA 98503

RE: Solid Wood  
Work Order Number: L23D047

Enclosed are the results of analyses for samples received by our laboratory on 4/10/2023.

Applicable detection limits and QA/QC data are included. The sample(s) will be disposed of within 30 days unless we are contacted to arrange long term storage.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please feel free to contact us. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry Chilcutt  
Senior Chemist

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# Libby Environmental, Inc.

3322 South Bay Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@gmail.com

SOLID WOOD PROJECT

Pioneer Technologies Corporation

Libby Project # L23D047

Date Received 4/10/2023

Time Received 12:55

Received By PB

## Sample Receipt Checklist

### Chain of Custody

1. Is the Chain of Custody is complete?  Yes  No
2. How was the sample delivered?  Hand Delivered  Picked Up  Shipped

### Log In

3. Cooler or Shipping Container is present.  Yes  No  N/A
4. Cooler or Shipping Container is in good condition.  Yes  No  N/A
5. Cooler or Shipping Container has Custody Seals present.  Yes  No  N/A
6. Was an attempt made to cool the samples?  Yes  No  N/A
7. Temperature of cooler (0°C to 8°C recommended) -1.1 °C
8. Temperature of sample(s) (0°C to 8°C recommended) 0.3 °C
9. Did all containers arrive in good condition (unbroken)?  Yes  No
10. Is it clear what analyses were requested?  Yes  No
11. Did container labels match Chain of Custody?  Yes  No
12. Are matrices correctly identified on Chain of Custody?  Yes  No
13. Are correct containers used for the analysis indicated?  Yes  No
14. Is there sufficient sample volume for indicated analysis?  Yes  No
15. Were all containers properly preserved per each analysis?  Yes  No
16. Were VOA vials collected correctly (no headspace)?  Yes  No  N/A
17. Were all holding times able to be met?  Yes  No

### Discrepancies/ Notes

18. Was client notified of all discrepancies?  Yes  No  N/A

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: \_\_\_\_\_

Regarding: \_\_\_\_\_

19. Comments. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



3600 Fremont Ave. N.  
Seattle, WA 98103  
T: (206) 352-3790  
F: (206) 352-7178  
info@fremontanalytical.com

**Libby Environmental**  
Sherry Chilcutt  
3322 South Bay Road NE  
Olympia, WA 98506

**RE: Solid Wood**  
**Work Order Number: 2304243**

April 18, 2023

**Attention Sherry Chilcutt:**

Fremont Analytical, Inc. received 9 sample(s) on 4/11/2023 for the analyses presented in the following report.

***Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)***  
***Sample Moisture (Percent Moisture)***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing*  
*ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing*  
*Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

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Original

[www.fremontanalytical.com](http://www.fremontanalytical.com)



Date: 04/18/2023

**CLIENT:** Libby Environmental  
**Project:** Solid Wood  
**Work Order:** 2304243

## Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2304243-001	WB-SO-SB26-0060	04/10/2023 9:07 AM	04/11/2023 10:10 AM
2304243-002	WB-SO-SS11-0020	04/10/2023 10:00 AM	04/11/2023 10:10 AM
2304243-003	WB-SO-SS11-0060	04/10/2023 10:00 AM	04/11/2023 10:10 AM
2304243-004	WB-SO-SS07-0020	04/10/2023 10:30 AM	04/11/2023 10:10 AM
2304243-005	WB-SO-SS07-0060	04/10/2023 10:30 AM	04/11/2023 10:10 AM
2304243-006	WB-SO-SS06-0020	04/10/2023 10:30 AM	04/11/2023 10:10 AM
2304243-007	WB-SO-SS08-0020	04/10/2023 12:00 PM	04/11/2023 10:10 AM
2304243-008	WB-SO-SS08-0060	04/10/2023 12:00 PM	04/11/2023 10:10 AM
2304243-009	WB-SO-SS08-1060	04/10/2023 12:00 PM	04/11/2023 10:10 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original



**CLIENT:** Libby Environmental**Project:** Solid Wood

---

**I. SAMPLE RECEIPT:**

Samples receipt information is recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

## Qualifiers:

- \* - Associated LCS is outside of control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Method Detection Limit
- R - High relative percent difference observed

## Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



# Analytical Report

Work Order: 2304243  
 Date Reported: 4/18/2023

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-001  
**Client Sample ID:** WB-SO-SB26-0060

**Collection Date:** 4/10/2023 9:07:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>					Batch ID: 39988		Analyst: CB
Benz(a)anthracene	18.3	23.2	8.23	J	µg/Kg-dry	1	04/12/23 23:18:11
Chrysene	13.7	23.2	4.05	J	µg/Kg-dry	1	04/12/23 23:18:11
Benzo(b)fluoranthene	ND	29.0	8.94		µg/Kg-dry	1	04/12/23 23:18:11
Benzo(k)fluoranthene	ND	29.0	10.2		µg/Kg-dry	1	04/12/23 23:18:11
Benzo(a)pyrene	ND	34.7	10.6		µg/Kg-dry	1	04/12/23 23:18:11
Indeno(1,2,3-cd)pyrene	ND	46.3	8.27		µg/Kg-dry	1	04/12/23 23:18:11
Dibenz(a,h)anthracene	ND	57.9	26.2		µg/Kg-dry	1	04/12/23 23:18:11
Surr: 2-Fluorobiphenyl	96.6	29.4 - 126			%Rec	1	04/12/23 23:18:11
Surr: Terphenyl-d14 (surr)	104	32.5 - 139			%Rec	1	04/12/23 23:18:11

<b><u>Sample Moisture (Percent Moisture)</u></b>					Batch ID: R83107		Analyst: MP
Percent Moisture	18.2	0.500	0.100		wt%	1	04/12/23 8:16:39





# Analytical Report

Work Order: 2304243  
Date Reported: 4/18/2023

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-002  
**Client Sample ID:** WB-SO-SS11-0020

**Collection Date:** 4/10/2023 10:00:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	27.0	9.57		µg/Kg-dry	1	04/12/23 23:45:54
Chrysene	ND	27.0	4.71		µg/Kg-dry	1	04/12/23 23:45:54
Benzo(b)fluoranthene	ND	33.7	10.4		µg/Kg-dry	1	04/12/23 23:45:54
Benzo(k)fluoranthene	ND	33.7	11.8		µg/Kg-dry	1	04/12/23 23:45:54
Benzo(a)pyrene	ND	40.4	12.4		µg/Kg-dry	1	04/12/23 23:45:54
Indeno(1,2,3-cd)pyrene	ND	53.9	9.62		µg/Kg-dry	1	04/12/23 23:45:54
Dibenz(a,h)anthracene	ND	67.4	30.5		µg/Kg-dry	1	04/12/23 23:45:54
Surr: 2-Fluorobiphenyl	96.1	29.4 - 126			%Rec	1	04/12/23 23:45:54
Surr: Terphenyl-d14 (surr)	105	32.5 - 139			%Rec	1	04/12/23 23:45:54
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	29.7	0.500	0.100		wt%	1	04/12/23 8:16:39



# Analytical Report

Work Order: 2304243

Date Reported: 4/18/2023

**Client:** Libby Environmental

**Collection Date:** 4/10/2023 10:00:00 AM

**Project:** Solid Wood

**Lab ID:** 2304243-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SS11-0060

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>					Batch ID: 39988		Analyst: CB
Benz(a)anthracene	16.9	36.6	13.0	J	µg/Kg-dry	1	04/13/23 0:13:34
Chrysene	19.7	36.6	6.41	J	µg/Kg-dry	1	04/13/23 0:13:34
Benzo(b)fluoranthene	ND	45.8	14.1		µg/Kg-dry	1	04/13/23 0:13:34
Benzo(k)fluoranthene	ND	45.8	16.1		µg/Kg-dry	1	04/13/23 0:13:34
Benzo(a)pyrene	ND	55.0	16.8		µg/Kg-dry	1	04/13/23 0:13:34
Indeno(1,2,3-cd)pyrene	ND	73.3	13.1		µg/Kg-dry	1	04/13/23 0:13:34
Dibenz(a,h)anthracene	ND	91.6	41.5		µg/Kg-dry	1	04/13/23 0:13:34
Surr: 2-Fluorobiphenyl	89.0	29.4 - 126			%Rec	1	04/13/23 0:13:34
Surr: Terphenyl-d14 (surr)	101	32.5 - 139			%Rec	1	04/13/23 0:13:34

<b><u>Sample Moisture (Percent Moisture)</u></b>					Batch ID: R83107		Analyst: MP
Percent Moisture	47.3	0.500	0.100		wt%	1	04/12/23 8:16:39



# Analytical Report

Work Order: **2304243**  
 Date Reported: **4/18/2023**

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-004  
**Client Sample ID:** WB-SO-SS07-0020

**Collection Date:** 4/10/2023 10:30:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	21.7	7.71		µg/Kg-dry	1	04/13/23 0:41:21
Chrysene	ND	21.7	3.79		µg/Kg-dry	1	04/13/23 0:41:21
Benzo(b)fluoranthene	ND	27.1	8.37		µg/Kg-dry	1	04/13/23 0:41:21
Benzo(k)fluoranthene	ND	27.1	9.53		µg/Kg-dry	1	04/13/23 0:41:21
Benzo(a)pyrene	ND	32.5	9.95		µg/Kg-dry	1	04/13/23 0:41:21
Indeno(1,2,3-cd)pyrene	ND	43.4	7.75		µg/Kg-dry	1	04/13/23 0:41:21
Dibenz(a,h)anthracene	ND	54.2	24.6		µg/Kg-dry	1	04/13/23 0:41:21
Surr: 2-Fluorobiphenyl	95.4	29.4 - 126			%Rec	1	04/13/23 0:41:21
Surr: Terphenyl-d14 (surr)	101	32.5 - 139			%Rec	1	04/13/23 0:41:21
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	8.83	0.500	0.100		wt%	1	04/12/23 8:16:39





# Analytical Report

Work Order: **2304243**  
 Date Reported: **4/18/2023**

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-005  
**Client Sample ID:** WB-SO-SS07-0060

**Collection Date:** 4/10/2023 10:30:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	26.0	9.25		µg/Kg-dry	1	04/13/23 1:08:59
Chrysene	ND	26.0	4.55		µg/Kg-dry	1	04/13/23 1:08:59
Benzo(b)fluoranthene	ND	32.5	10.0		µg/Kg-dry	1	04/13/23 1:08:59
Benzo(k)fluoranthene	ND	32.5	11.4		µg/Kg-dry	1	04/13/23 1:08:59
Benzo(a)pyrene	ND	39.1	11.9		µg/Kg-dry	1	04/13/23 1:08:59
Indeno(1,2,3-cd)pyrene	ND	52.1	9.30		µg/Kg-dry	1	04/13/23 1:08:59
Dibenz(a,h)anthracene	ND	65.1	29.5		µg/Kg-dry	1	04/13/23 1:08:59
Surr: 2-Fluorobiphenyl	95.9	29.4 - 126			%Rec	1	04/13/23 1:08:59
Surr: Terphenyl-d14 (surr)	99.4	32.5 - 139			%Rec	1	04/13/23 1:08:59
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	23.9	0.500	0.100		wt%	1	04/12/23 8:16:39



# Analytical Report

Work Order: 2304243  
Date Reported: 4/18/2023

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-006  
**Client Sample ID:** WB-SO-SS06-0020

**Collection Date:** 4/10/2023 10:30:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	25.2	8.97		µg/Kg-dry	1	04/13/23 1:36:40
Chrysene	6.89	25.2	4.41	J	µg/Kg-dry	1	04/13/23 1:36:40
Benzo(b)fluoranthene	116	31.6	9.74		µg/Kg-dry	1	04/13/23 1:36:40
Benzo(k)fluoranthene	27.6	31.6	11.1	J	µg/Kg-dry	1	04/13/23 1:36:40
Benzo(a)pyrene	32.2	37.9	11.6	J	µg/Kg-dry	1	04/13/23 1:36:40
Indeno(1,2,3-cd)pyrene	31.4	50.5	9.01	J	µg/Kg-dry	1	04/13/23 1:36:40
Dibenz(a,h)anthracene	ND	63.1	28.6		µg/Kg-dry	1	04/13/23 1:36:40
Surr: 2-Fluorobiphenyl	97.2	29.4 - 126			%Rec	1	04/13/23 1:36:40
Surr: Terphenyl-d14 (surr)	101	32.5 - 139			%Rec	1	04/13/23 1:36:40
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	24.0	0.500	0.100		wt%	1	04/12/23 8:16:39



# Analytical Report

Work Order: **2304243**  
 Date Reported: **4/18/2023**

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-007  
**Client Sample ID:** WB-SO-SS08-0020

**Collection Date:** 4/10/2023 12:00:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	25.5	9.07		µg/Kg-dry	1	04/13/23 2:04:23
Chrysene	ND	25.5	4.46		µg/Kg-dry	1	04/13/23 2:04:23
Benzo(b)fluoranthene	ND	31.9	9.85		µg/Kg-dry	1	04/13/23 2:04:23
Benzo(k)fluoranthene	ND	31.9	11.2		µg/Kg-dry	1	04/13/23 2:04:23
Benzo(a)pyrene	ND	38.3	11.7		µg/Kg-dry	1	04/13/23 2:04:23
Indeno(1,2,3-cd)pyrene	ND	51.1	9.12		µg/Kg-dry	1	04/13/23 2:04:23
Dibenz(a,h)anthracene	ND	63.8	28.9		µg/Kg-dry	1	04/13/23 2:04:23
Surr: 2-Fluorobiphenyl	106	29.4 - 126			%Rec	1	04/13/23 2:04:23
Surr: Terphenyl-d14 (surr)	109	32.5 - 139			%Rec	1	04/13/23 2:04:23
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	25.8	0.500	0.100		wt%	1	04/12/23 8:16:39



# Analytical Report

Work Order: 2304243  
Date Reported: 4/18/2023

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-008  
**Client Sample ID:** WB-SO-SS08-0060

**Collection Date:** 4/10/2023 12:00:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	24.6	8.74		µg/Kg-dry	1	04/13/23 2:32:02
Chrysene	ND	24.6	4.30		µg/Kg-dry	1	04/13/23 2:32:02
Benzo(b)fluoranthene	ND	30.8	9.49		µg/Kg-dry	1	04/13/23 2:32:02
Benzo(k)fluoranthene	ND	30.8	10.8		µg/Kg-dry	1	04/13/23 2:32:02
Benzo(a)pyrene	ND	36.9	11.3		µg/Kg-dry	1	04/13/23 2:32:02
Indeno(1,2,3-cd)pyrene	ND	49.2	8.79		µg/Kg-dry	1	04/13/23 2:32:02
Dibenz(a,h)anthracene	ND	61.5	27.9		µg/Kg-dry	1	04/13/23 2:32:02
Surr: 2-Fluorobiphenyl	103	29.4 - 126			%Rec	1	04/13/23 2:32:02
Surr: Terphenyl-d14 (surr)	108	32.5 - 139			%Rec	1	04/13/23 2:32:02
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	20.7	0.500	0.100		wt%	1	04/12/23 8:16:39





# Analytical Report

Work Order: 2304243  
 Date Reported: 4/18/2023

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304243-009  
**Client Sample ID:** WB-SO-SS08-1060

**Collection Date:** 4/10/2023 12:00:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 39988		Analyst: CB		
Benz(a)anthracene	ND	25.6	9.08		µg/Kg-dry	1	04/13/23 2:59:41
Chrysene	ND	25.6	4.47		µg/Kg-dry	1	04/13/23 2:59:41
Benzo(b)fluoranthene	ND	32.0	9.86		µg/Kg-dry	1	04/13/23 2:59:41
Benzo(k)fluoranthene	ND	32.0	11.2		µg/Kg-dry	1	04/13/23 2:59:41
Benzo(a)pyrene	ND	38.4	11.7		µg/Kg-dry	1	04/13/23 2:59:41
Indeno(1,2,3-cd)pyrene	ND	51.1	9.13		µg/Kg-dry	1	04/13/23 2:59:41
Dibenz(a,h)anthracene	ND	63.9	29.0		µg/Kg-dry	1	04/13/23 2:59:41
Surr: 2-Fluorobiphenyl	91.5	29.4 - 126			%Rec	1	04/13/23 2:59:41
Surr: Terphenyl-d14 (surr)	93.6	32.5 - 139			%Rec	1	04/13/23 2:59:41
<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83107		Analyst: MP		
Percent Moisture	23.7	0.500	0.100		wt%	1	04/12/23 8:16:39

Work Order: 2304243  
 CLIENT: Libby Environmental  
 Project: Solid Wood

**QC SUMMARY REPORT**

**Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)**

Sample ID: <b>MB-39988</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>4/12/2023</b>	RunNo: <b>83242</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>39988</b>		Analysis Date: <b>4/12/2023</b>	SeqNo: <b>1733215</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	ND	20.0									
Chrysene	ND	20.0									
Benzo(b)fluoranthene	ND	25.0									
Benzo(k)fluoranthene	ND	25.0									
Benzo(a)pyrene	ND	30.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	50.0									
Surr: 2-Fluorobiphenyl	1,020		1,000		102	29.4	126				
Surr: Terphenyl-d14 (surr)	1,070		1,000		107	32.5	139				

Sample ID: <b>LCS-39988</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>4/12/2023</b>	RunNo: <b>83242</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>39988</b>		Analysis Date: <b>4/12/2023</b>	SeqNo: <b>1733216</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	1,860	20.0	2,000	0	92.9	59.8	131				
Chrysene	1,760	20.0	2,000	0	87.8	54.1	116				
Benzo(b)fluoranthene	1,670	25.0	2,000	0	83.3	56.7	123				
Benzo(k)fluoranthene	1,740	25.0	2,000	0	87.1	54.9	119				
Benzo(a)pyrene	1,710	30.0	2,000	0	85.7	54.7	121				
Indeno(1,2,3-cd)pyrene	1,730	40.0	2,000	0	86.5	57.1	119				
Dibenz(a,h)anthracene	1,760	50.0	2,000	0	88.0	57.2	117				
Surr: 2-Fluorobiphenyl	1,370		2,000		68.5	29.4	126				
Surr: Terphenyl-d14 (surr)	1,530		2,000		76.4	32.5	139				

Sample ID: <b>2304156-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/12/2023</b>	RunNo: <b>83242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>39988</b>		Analysis Date: <b>4/12/2023</b>	SeqNo: <b>1733218</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	1,880	21.5	2,149	9.496	87.0	47.4	115				
Chrysene	1,780	21.5	2,149	12.32	82.4	41.5	108				
Benzo(b)fluoranthene	1,770	26.9	2,149	11.25	81.9	42.7	117				

Work Order: 2304243  
 CLIENT: Libby Environmental  
 Project: Solid Wood

**QC SUMMARY REPORT**

**Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)**

Sample ID: <b>2304156-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/12/2023</b>	RunNo: <b>83242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>39988</b>	Analysis Date: <b>4/12/2023</b>	SeqNo: <b>1733218</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzo(k)fluoranthene	1,760	26.9	2,149	0	81.8	39.4	112				
Benzo(a)pyrene	1,820	32.2	2,149	0	84.7	39.8	111				
Indeno(1,2,3-cd)pyrene	1,690	43.0	2,149	0	78.8	36.6	111				
Dibenz(a,h)anthracene	1,720	53.7	2,149	0	79.8	38.5	106				
Surr: 2-Fluorobiphenyl	1,460		1,074		136	29.4	126				S
Surr: Terphenyl-d14 (surr)	1,600		1,074		149	32.5	139				S

**NOTES:**

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: <b>2304156-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/12/2023</b>	RunNo: <b>83242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>39988</b>	Analysis Date: <b>4/12/2023</b>	SeqNo: <b>1733219</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benz(a)anthracene	2,100	21.5	2,149	9.496	97.4	47.4	115	1,878	11.2	30	
Chrysene	1,990	21.5	2,149	12.32	92.2	41.5	108	1,783	11.2	30	
Benzo(b)fluoranthene	2,040	26.9	2,149	11.25	94.3	42.7	117	1,771	14.0	30	
Benzo(k)fluoranthene	1,950	26.9	2,149	0	90.8	39.4	112	1,757	10.5	30	
Benzo(a)pyrene	2,030	32.2	2,149	0	94.3	39.8	111	1,820	10.8	30	
Indeno(1,2,3-cd)pyrene	1,860	43.0	2,149	0	86.6	36.6	111	1,692	9.46	30	
Dibenz(a,h)anthracene	1,880	53.7	2,149	0	87.7	38.5	106	1,715	9.39	30	
Surr: 2-Fluorobiphenyl	1,520		1,074		141	29.4	126		0		S
Surr: Terphenyl-d14 (surr)	1,620		1,074		151	32.5	139		0		S

**NOTES:**

S - Outlying surrogate recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.



# Sample Log-In Check List

Client Name: LIBBY	Work Order Number: 2304243
Logged by: Morgan Wilson	Date Received: 4/11/2023 10:10:00 AM

**Chain of Custody**

1. Is Chain of Custody complete? Yes  No  Not Present
2. How was the sample delivered? UPS

**Log In**

3. Coolers are present? Yes  No  NA
4. Shipping container/cooler in good condition? Yes  No
5. Custody Seals present on shipping container/cooler?  
(Refer to comments for Custody Seals not intact) Yes  No  Not Present
6. Was an attempt made to cool the samples? Yes  No  NA
7. Were all items received at a temperature of >2°C to 6°C \* Yes  No  NA
8. Sample(s) in proper container(s)? Yes  No
9. Sufficient sample volume for indicated test(s)? Yes  No
10. Are samples properly preserved? Yes  No
11. Was preservative added to bottles? Yes  No  NA
12. Is there headspace in the VOA vials? Yes  No  NA
13. Did all samples containers arrive in good condition(unbroken)? Yes  No
14. Does paperwork match bottle labels? Yes  No
15. Are matrices correctly identified on Chain of Custody? Yes  No
16. Is it clear what analyses were requested? Yes  No
17. Were all holding times able to be met? Yes  No

**Special Handling (if applicable)**

18. Was client notified of all discrepancies with this order? Yes  No  NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

**Item Information**

Item #	Temp °C
Sampe	1.1

\* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C





# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L23D047**

2304243

### Sending Laboratory:

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

### Subcontracted Laboratory:

Fremont Analytical, Inc.  
3600 Fremont Ave N  
Seattle, WA 98103  
Phone: (206) 352-3790  
Fax:

Requested Turnaround (TAT) 5d

**Project:** Solid Wood

Analysis	Comments
<b>Client Sample ID: WB-SO-SB26-0060</b> <i>Soil Sampled: 04/10/2023 09:07</i> cPAH by 8270 <i>Containers Supplied:</i>	Lab ID: L23D047-01 Report to MDL
<b>Client Sample ID: WB-SO-SS11-0020</b> <i>Soil Sampled: 04/10/2023 10:00</i> cPAH by 8270 <i>Containers Supplied:</i>	Lab ID: L23D047-03 Report to MDL
<b>Client Sample ID: WB-SO-SS11-0060</b> <i>Soil Sampled: 04/10/2023 10:00</i> cPAH by 8270 <i>Containers Supplied:</i>	Lab ID: L23D047-04 Report to MDL
<b>Client Sample ID: WB-SO-SS07-0020</b> <i>Soil Sampled: 04/10/2023 10:30</i> cPAH by 8270 <i>Containers Supplied:</i>	Lab ID: L23D047-06 Report to MDL
<b>Client Sample ID: WB-SO-SS07-0060</b> <i>Soil Sampled: 04/10/2023 10:30</i> cPAH by 8270 <i>Containers Supplied:</i>	Lab ID: L23D047-07 Report to MDL
<b>Client Sample ID: WB-SO-SS06-0020</b> <i>Soil Sampled: 04/10/2023 10:30</i> cPAH by 8270 <i>Containers Supplied:</i>	Lab ID: L23D047-09 Report to MDL

Released By: [Signature]    Date: 4/10/23  
[Signature]    4/10/23

Received By: [Signature]    Date: 4/11/23



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L23D047  
(Continued)**

**Project:** Solid Wood

2304243

Analysis	Comments
<b>Client Sample ID: WB-SO-SS08-0020</b> Soil Sampled: 04/10/2023 12:00	Lab ID: L23D047-10
cPAH by 8270	Report to MDL
<i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SS08-0060</b> Soil Sampled: 04/10/2023 12:00	Lab ID: L23D047-11
cPAH by 8270	Report to MDL
<i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SS08-1060</b> Soil Sampled: 04/10/2023 12:00	Lab ID: L23D047-12
cPAH by 8270	Report to MDL
<i>Containers Supplied:</i>	

  
 Released By \_\_\_\_\_ Date 4/10/23

  
 Received By \_\_\_\_\_ Date 4/11/23



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

Phone (360) 352-2110 • libbyenv@gmail.com

April 21, 2023

Hannah Morse  
Pioneer Technologies Corporation  
5205 Corporate Center Court SE, Suite A  
Olympia, WA 98503

RE: Solid Wood  
Work Order Number: L23D051

Enclosed are the results of analyses for samples received by our laboratory on 4/11/2023.

Applicable detection limits and QA/QC data are included. The sample(s) will be disposed of within 30 days unless we are contacted to arrange long term storage.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please feel free to contact us. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

Sherry Chilcutt  
Senior Chemist





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# Libby Environmental, Inc.

3322 South Bay Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@gmail.com

SOLID WOOD PROJECT

Pioneer Technologies Corporation

Libby Project # L23D051

Date Received 4/11/2023

Time Received 10:20

Received By AR

## Sample Receipt Checklist

### Chain of Custody

1. Is the Chain of Custody is complete?  Yes  No
2. How was the sample delivered?  Hand Delivered  Picked Up  Shipped

### Log In

3. Cooler or Shipping Container is present.  Yes  No  N/A
4. Cooler or Shipping Container is in good condition.  Yes  No  N/A
5. Cooler or Shipping Container has Custody Seals present.  Yes  No  N/A
6. Was an attempt made to cool the samples?  Yes  No  N/A
7. Temperature of cooler (0°C to 8°C recommended) 1.2 °C
8. Temperature of sample(s) (0°C to 8°C recommended) 5.0 °C
9. Did all containers arrive in good condition (unbroken)?  Yes  No
10. Is it clear what analyses were requested?  Yes  No
11. Did container labels match Chain of Custody?  Yes  No
12. Are matrices correctly identified on Chain of Custody?  Yes  No
13. Are correct containers used for the analysis indicated?  Yes  No
14. Is there sufficient sample volume for indicated analysis?  Yes  No
15. Were all containers properly preserved per each analysis?  Yes  No
16. Were VOA vials collected correctly (no headspace)?  Yes  No  N/A
17. Were all holding times able to be met?  Yes  No

### Discrepancies/ Notes

18. Was client notified of all discrepancies?  Yes  No  N/A

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: \_\_\_\_\_

Regarding: \_\_\_\_\_

19. Comments. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



3600 Fremont Ave. N.  
Seattle, WA 98103  
T: (206) 352-3790  
F: (206) 352-7178  
info@fremontanalytical.com

**Libby Environmental**  
Sherry Chilcutt  
3322 South Bay Road NE  
Olympia, WA 98506

**RE: Solid Wood**  
**Work Order Number: 2304305**

April 20, 2023

**Attention Sherry Chilcutt:**

Fremont Analytical, Inc. received 4 sample(s) on 4/13/2023 for the analyses presented in the following report.

***Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)***  
***Sample Moisture (Percent Moisture)***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing  
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing  
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

Original

[www.fremontanalytical.com](http://www.fremontanalytical.com)



Date: 04/20/2023

**CLIENT:** Libby Environmental  
**Project:** Solid Wood  
**Work Order:** 2304305

## Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2304305-001	WB-SO-SS01-0020	04/10/2023 9:00 AM	04/13/2023 9:24 AM
2304305-002	WB-SS-SS02-0020	04/10/2023 9:15 AM	04/13/2023 9:24 AM
2304305-003	WB-SS-SS03-0020	04/10/2023 9:30 AM	04/13/2023 9:24 AM
2304305-004	WB-SS-SS04-0020	04/10/2023 9:45 AM	04/13/2023 9:24 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original



**CLIENT:** Libby Environmental**Project:** Solid Wood

---

**I. SAMPLE RECEIPT:**

Samples receipt information is recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

## Qualifiers:

- \* - Associated LCS is outside of control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Method Detection Limit
- R - High relative percent difference observed

## Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



# Analytical Report

Work Order: 2304305  
Date Reported: 4/20/2023

**Client:** Libby Environmental  
**Project:** Solid Wood  
**Lab ID:** 2304305-001  
**Client Sample ID:** WB-SO-SS01-0020

**Collection Date:** 4/10/2023 9:00:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 40046		Analyst: CB		
Naphthalene	ND	22.3	4.77		µg/Kg-dry	1	04/18/23 20:32:05
2-Methylnaphthalene	ND	22.3	4.20		µg/Kg-dry	1	04/18/23 20:32:05
1-Methylnaphthalene	ND	22.3	3.43		µg/Kg-dry	1	04/18/23 20:32:05
Acenaphthylene	ND	22.3	3.27		µg/Kg-dry	1	04/18/23 20:32:05
Acenaphthene	ND	22.3	4.10		µg/Kg-dry	1	04/18/23 20:32:05
Fluorene	ND	22.3	2.79		µg/Kg-dry	1	04/18/23 20:32:05
Phenanthrene	ND	22.3	6.24		µg/Kg-dry	1	04/18/23 20:32:05
Anthracene	ND	22.3	2.99		µg/Kg-dry	1	04/18/23 20:32:05
Fluoranthene	ND	22.3	8.14		µg/Kg-dry	1	04/18/23 20:32:05
Pyrene	ND	44.6	10.2		µg/Kg-dry	1	04/18/23 20:32:05
Benz(a)anthracene	ND	22.3	7.92		µg/Kg-dry	1	04/18/23 20:32:05
Chrysene	ND	22.3	3.90		µg/Kg-dry	1	04/18/23 20:32:05
Benzo(b)fluoranthene	ND	27.9	8.61		µg/Kg-dry	1	04/18/23 20:32:05
Benzo(k)fluoranthene	ND	27.9	9.80		µg/Kg-dry	1	04/18/23 20:32:05
Benzo(a)pyrene	ND	33.5	10.2		µg/Kg-dry	1	04/18/23 20:32:05
Indeno(1,2,3-cd)pyrene	ND	44.6	7.97		µg/Kg-dry	1	04/18/23 20:32:05
Dibenz(a,h)anthracene	ND	55.8	25.3		µg/Kg-dry	1	04/18/23 20:32:05
Benzo(g,h,i)perylene	ND	55.8	24.2		µg/Kg-dry	1	04/18/23 20:32:05
Surr: 2-Fluorobiphenyl	120	29.4 - 126			%Rec	1	04/18/23 20:32:05
Surr: Terphenyl-d14 (surr)	112	32.5 - 139			%Rec	1	04/18/23 20:32:05

<b><u>Sample Moisture (Percent Moisture)</u></b>			Batch ID: R83259		Analyst: MP		
Percent Moisture	14.7	0.500	0.100		wt%	1	04/18/23 8:19:33



# Analytical Report

Work Order: 2304305  
Date Reported: 4/20/2023

**Client:** Libby Environmental

**Collection Date:** 4/10/2023 9:15:00 AM

**Project:** Solid Wood

**Lab ID:** 2304305-002

**Matrix:** Soil

**Client Sample ID:** WB-SS-SS02-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 40046		Analyst: CB		
Naphthalene	ND	20.9	4.46		µg/Kg-dry	1	04/18/23 20:59:59
2-Methylnaphthalene	ND	20.9	3.93		µg/Kg-dry	1	04/18/23 20:59:59
1-Methylnaphthalene	ND	20.9	3.21		µg/Kg-dry	1	04/18/23 20:59:59
Acenaphthylene	ND	20.9	3.06		µg/Kg-dry	1	04/18/23 20:59:59
Acenaphthene	ND	20.9	3.84		µg/Kg-dry	1	04/18/23 20:59:59
Fluorene	ND	20.9	2.61		µg/Kg-dry	1	04/18/23 20:59:59
Phenanthrene	ND	20.9	5.84		µg/Kg-dry	1	04/18/23 20:59:59
Anthracene	ND	20.9	2.80		µg/Kg-dry	1	04/18/23 20:59:59
Fluoranthene	ND	20.9	7.62		µg/Kg-dry	1	04/18/23 20:59:59
Pyrene	ND	41.8	9.54		µg/Kg-dry	1	04/18/23 20:59:59
Benz(a)anthracene	ND	20.9	7.42		µg/Kg-dry	1	04/18/23 20:59:59
Chrysene	ND	20.9	3.65		µg/Kg-dry	1	04/18/23 20:59:59
Benzo(b)fluoranthene	ND	26.1	8.05		µg/Kg-dry	1	04/18/23 20:59:59
Benzo(k)fluoranthene	ND	26.1	9.17		µg/Kg-dry	1	04/18/23 20:59:59
Benzo(a)pyrene	ND	31.3	9.57		µg/Kg-dry	1	04/18/23 20:59:59
Indeno(1,2,3-cd)pyrene	ND	41.8	7.46		µg/Kg-dry	1	04/18/23 20:59:59
Dibenz(a,h)anthracene	ND	52.2	23.6		µg/Kg-dry	1	04/18/23 20:59:59
Benzo(g,h,i)perylene	ND	52.2	22.6		µg/Kg-dry	1	04/18/23 20:59:59
Surr: 2-Fluorobiphenyl	125	29.4 - 126			%Rec	1	04/18/23 20:59:59
Surr: Terphenyl-d14 (surr)	116	32.5 - 139			%Rec	1	04/18/23 20:59:59

**Sample Moisture (Percent Moisture)**

Batch ID: R83259 Analyst: MP

Percent Moisture	6.09	0.500	0.100		wt%	1	04/18/23 8:19:33
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# Analytical Report

Work Order: 2304305  
Date Reported: 4/20/2023

**Client:** Libby Environmental

**Collection Date:** 4/10/2023 9:30:00 AM

**Project:** Solid Wood

**Lab ID:** 2304305-003

**Matrix:** Soil

**Client Sample ID:** WB-SS-SS03-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 40046		Analyst: CB		
Naphthalene	ND	21.4	4.56		µg/Kg-dry	1	04/18/23 21:27:39
2-Methylnaphthalene	ND	21.4	4.02		µg/Kg-dry	1	04/18/23 21:27:39
1-Methylnaphthalene	ND	21.4	3.29		µg/Kg-dry	1	04/18/23 21:27:39
Acenaphthylene	ND	21.4	3.14		µg/Kg-dry	1	04/18/23 21:27:39
Acenaphthene	ND	21.4	3.93		µg/Kg-dry	1	04/18/23 21:27:39
Fluorene	ND	21.4	2.67		µg/Kg-dry	1	04/18/23 21:27:39
Phenanthrene	ND	21.4	5.97		µg/Kg-dry	1	04/18/23 21:27:39
Anthracene	ND	21.4	2.87		µg/Kg-dry	1	04/18/23 21:27:39
Fluoranthene	ND	21.4	7.80		µg/Kg-dry	1	04/18/23 21:27:39
Pyrene	ND	42.7	9.77		µg/Kg-dry	1	04/18/23 21:27:39
Benz(a)anthracene	ND	21.4	7.59		µg/Kg-dry	1	04/18/23 21:27:39
Chrysene	ND	21.4	3.74		µg/Kg-dry	1	04/18/23 21:27:39
Benzo(b)fluoranthene	11.1	26.7	8.24	J	µg/Kg-dry	1	04/18/23 21:27:39
Benzo(k)fluoranthene	ND	26.7	9.39		µg/Kg-dry	1	04/18/23 21:27:39
Benzo(a)pyrene	ND	32.1	9.80		µg/Kg-dry	1	04/18/23 21:27:39
Indeno(1,2,3-cd)pyrene	ND	42.7	7.63		µg/Kg-dry	1	04/18/23 21:27:39
Dibenz(a,h)anthracene	ND	53.4	24.2		µg/Kg-dry	1	04/18/23 21:27:39
Benzo(g,h,i)perylene	ND	53.4	23.2		µg/Kg-dry	1	04/18/23 21:27:39
Surr: 2-Fluorobiphenyl	125	29.4 - 126			%Rec	1	04/18/23 21:27:39
Surr: Terphenyl-d14 (surr)	114	32.5 - 139			%Rec	1	04/18/23 21:27:39

**Sample Moisture (Percent Moisture)**

Batch ID: R83259

Analyst: MP

Percent Moisture	9.58	0.500	0.100		wt%	1	04/18/23 8:19:33
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# Analytical Report

Work Order: 2304305  
Date Reported: 4/20/2023

**Client:** Libby Environmental

**Collection Date:** 4/10/2023 9:45:00 AM

**Project:** Solid Wood

**Lab ID:** 2304305-004

**Matrix:** Soil

**Client Sample ID:** WB-SS-SS04-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b><u>Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)</u></b>			Batch ID: 40046		Analyst: CB		
Naphthalene	ND	23.3	4.99		µg/Kg-dry	1	04/18/23 22:50:43
2-Methylnaphthalene	ND	23.3	4.40		µg/Kg-dry	1	04/18/23 22:50:43
1-Methylnaphthalene	ND	23.3	3.59		µg/Kg-dry	1	04/18/23 22:50:43
Acenaphthylene	ND	23.3	3.43		µg/Kg-dry	1	04/18/23 22:50:43
Acenaphthene	ND	23.3	4.29		µg/Kg-dry	1	04/18/23 22:50:43
Fluorene	ND	23.3	2.92		µg/Kg-dry	1	04/18/23 22:50:43
Phenanthrene	ND	23.3	6.53		µg/Kg-dry	1	04/18/23 22:50:43
Anthracene	ND	23.3	3.13		µg/Kg-dry	1	04/18/23 22:50:43
Fluoranthene	ND	23.3	8.52		µg/Kg-dry	1	04/18/23 22:50:43
Pyrene	ND	46.7	10.7		µg/Kg-dry	1	04/18/23 22:50:43
Benz(a)anthracene	ND	23.3	8.29		µg/Kg-dry	1	04/18/23 22:50:43
Chrysene	ND	23.3	4.08		µg/Kg-dry	1	04/18/23 22:50:43
Benzo(b)fluoranthene	ND	29.2	9.01		µg/Kg-dry	1	04/18/23 22:50:43
Benzo(k)fluoranthene	ND	29.2	10.3		µg/Kg-dry	1	04/18/23 22:50:43
Benzo(a)pyrene	ND	35.0	10.7		µg/Kg-dry	1	04/18/23 22:50:43
Indeno(1,2,3-cd)pyrene	ND	46.7	8.34		µg/Kg-dry	1	04/18/23 22:50:43
Dibenz(a,h)anthracene	ND	58.4	26.4		µg/Kg-dry	1	04/18/23 22:50:43
Benzo(g,h,i)perylene	ND	58.4	25.3		µg/Kg-dry	1	04/18/23 22:50:43
Surr: 2-Fluorobiphenyl	126	29.4 - 126			%Rec	1	04/18/23 22:50:43
Surr: Terphenyl-d14 (surr)	114	32.5 - 139			%Rec	1	04/18/23 22:50:43

**Sample Moisture (Percent Moisture)**

Batch ID: R83259

Analyst: MP

Percent Moisture	16.5	0.500	0.100		wt%	1	04/18/23 8:19:33
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Work Order: 2304305  
 CLIENT: Libby Environmental  
 Project: Solid Wood

**QC SUMMARY REPORT**

**Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)**

Sample ID: <b>MB-40046</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>40046</b>		Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735847</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	ND	20.0									
2-Methylnaphthalene	ND	20.0									
1-Methylnaphthalene	ND	20.0									
Acenaphthene	ND	20.0									
Acenaphthylene	ND	20.0									
Phenanthrene	ND	20.0									
Fluorene	ND	20.0									
Anthracene	ND	20.0									
Fluoranthene	ND	20.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	20.0									
Chrysene	ND	20.0									
Benzo(b)fluoranthene	ND	25.0									
Benzo(k)fluoranthene	ND	25.0									
Benzo(a)pyrene	ND	30.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	50.0									
Benzo(g,h,i)perylene	ND	50.0									
Surr: 2-Fluorobiphenyl	1,280		1,000		128	29.4	126				S
Surr: Terphenyl-d14 (surr)	1,170		1,000		117	32.5	139				

**NOTES:**

S - Outlying surrogate recovery(ies) observed.

Sample ID: <b>LCS-40046</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>40046</b>		Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735848</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	2,120	20.0	2,000	0	106	58.3	115				
2-Methylnaphthalene	2,140	20.0	2,000	0	107	57.2	115				
1-Methylnaphthalene	2,280	20.0	2,000	0	114	55.9	114				
Acenaphthene	2,150	20.0	2,000	0	108	55.4	118				
Acenaphthylene	2,340	20.0	2,000	0	117	55.2	117				



Work Order: 2304305  
 CLIENT: Libby Environmental  
 Project: Solid Wood

**QC SUMMARY REPORT**

**Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)**

Sample ID: <b>LCS-40046</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>40046</b>		Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735848</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenanthrene	2,290	20.0	2,000	0	115	55.9	118				
Fluorene	2,130	20.0	2,000	0	107	57.2	119				
Anthracene	2,280	20.0	2,000	0	114	55.3	120				
Fluoranthene	2,150	20.0	2,000	0	108	56.7	123				
Pyrene	2,220	40.0	2,000	0	111	57.6	123				
Benz(a)anthracene	1,980	20.0	2,000	0	98.8	59.8	131				
Chrysene	2,280	20.0	2,000	0	114	54.1	116				
Benzo(b)fluoranthene	2,140	25.0	2,000	0	107	56.7	123				
Benzo(k)fluoranthene	2,210	25.0	2,000	0	110	54.9	119				
Benzo(a)pyrene	2,220	30.0	2,000	0	111	54.7	121				
Indeno(1,2,3-cd)pyrene	2,110	40.0	2,000	0	105	57.1	119				
Dibenz(a,h)anthracene	2,150	50.0	2,000	0	107	57.2	117				
Benzo(g,h,i)perylene	2,090	50.0	2,000	0	105	52.9	115				
Surr: 2-Fluorobiphenyl	1,390		1,000		139	29.4	126				S
Surr: Terphenyl-d14 (surr)	1,200		1,000		120	32.5	139				

**NOTES:**

S - Outlying surrogate recovery(ies) observed.

Sample ID: <b>2304305-003AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>WB-SS-SS03-0020</b>	Batch ID: <b>40046</b>		Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735852</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	2,370	21.5	2,148	0	110	46.1	106				S
2-Methylnaphthalene	2,390	21.5	2,148	0	111	45.7	105				S
1-Methylnaphthalene	2,560	21.5	2,148	0	119	45.1	105				S
Acenaphthene	2,420	21.5	2,148	0	113	42.2	109				S
Acenaphthylene	2,610	21.5	2,148	0	122	44	108				S
Phenanthrene	2,570	21.5	2,148	0	120	41.3	110				S
Fluorene	2,370	21.5	2,148	0	111	44.8	111				
Anthracene	2,490	21.5	2,148	0	116	41	113				S
Fluoranthene	2,400	21.5	2,148	0	112	43.8	115				
Pyrene	2,470	43.0	2,148	0	115	44.3	112				S

Work Order: 2304305  
 CLIENT: Libby Environmental  
 Project: Solid Wood

**QC SUMMARY REPORT**

**Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)**

Sample ID: <b>2304305-003AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>WB-SS-SS03-0020</b>	Batch ID: <b>40046</b>		Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735852</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benz(a)anthracene	2,210	21.5	2,148	0	103	47.4	115				
Chrysene	2,550	21.5	2,148	0	119	41.5	108				S
Benzo(b)fluoranthene	2,490	26.8	2,148	11.13	115	42.7	117				
Benzo(k)fluoranthene	2,480	26.8	2,148	0	115	39.4	112				S
Benzo(a)pyrene	2,520	32.2	2,148	0	117	39.8	111				S
Indeno(1,2,3-cd)pyrene	2,340	43.0	2,148	0	109	36.6	111				
Dibenz(a,h)anthracene	2,370	53.7	2,148	0	111	38.5	106				S
Benzo(g,h,i)perylene	2,340	53.7	2,148	0	109	28.8	109				
Surr: 2-Fluorobiphenyl	1,510		1,074		141	29.4	126				S
Surr: Terphenyl-d14 (surr)	1,280		1,074		120	32.5	139				

**NOTES:**

S - Outlying spike/surrogate recoveries observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: <b>2304305-003AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>WB-SS-SS03-0020</b>	Batch ID: <b>40046</b>		Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735853</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Naphthalene	2,480	21.4	2,137	0	116	46.1	106	2,372	4.63	30	S
2-Methylnaphthalene	2,510	21.4	2,137	0	117	45.7	105	2,393	4.62	30	S
1-Methylnaphthalene	2,680	21.4	2,137	0	125	45.1	105	2,555	4.62	30	S
Acenaphthene	2,530	21.4	2,137	0	118	42.2	109	2,418	4.47	30	S
Acenaphthylene	2,720	21.4	2,137	0	127	44	108	2,611	3.98	30	S
Phenanthrene	2,640	21.4	2,137	0	124	41.3	110	2,574	2.60	30	S
Fluorene	2,490	21.4	2,137	0	117	44.8	111	2,375	4.77	30	S
Anthracene	2,580	21.4	2,137	0	121	41	113	2,490	3.58	30	S
Fluoranthene	2,520	21.4	2,137	0	118	43.8	115	2,402	4.62	30	S
Pyrene	2,570	42.7	2,137	0	120	44.3	112	2,468	4.22	30	S
Benzo(a)anthracene	2,300	21.4	2,137	0	108	47.4	115	2,214	3.97	30	
Chrysene	2,680	21.4	2,137	0	125	41.5	108	2,554	4.85	30	S
Benzo(b)fluoranthene	2,600	26.7	2,137	11.13	121	42.7	117	2,491	4.09	30	S
Benzo(k)fluoranthene	2,610	26.7	2,137	0	122	39.4	112	2,475	5.29	30	S
Benzo(a)pyrene	2,640	32.1	2,137	0	124	39.8	111	2,519	4.67	30	S

**Work Order:** 2304305  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood

**QC SUMMARY REPORT**

**Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)**

Sample ID: <b>2304305-003AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>4/18/2023</b>	RunNo: <b>83352</b>							
Client ID: <b>WB-SS-SS03-0020</b>	Batch ID: <b>40046</b>	Analysis Date: <b>4/18/2023</b>	SeqNo: <b>1735853</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Indeno(1,2,3-cd)pyrene	2,470	42.7	2,137	0	115	36.6	111	2,343	5.18	30	S
Dibenz(a,h)anthracene	2,480	53.4	2,137	0	116	38.5	106	2,374	4.47	30	S
Benzo(g,h,i)perylene	2,440	53.4	2,137	0	114	28.8	109	2,335	4.50	30	S
Surr: 2-Fluorobiphenyl	1,560		1,069		146	29.4	126		0		S
Surr: Terphenyl-d14 (surr)	1,330		1,069		124	32.5	139		0		

**NOTES:**

S - Outlying spike/surrogate recoveries observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Client Name: LIBBY	Work Order Number: 2304305
Logged by: Clare Griggs	Date Received: 4/13/2023 9:24:00 AM

**Chain of Custody**

1. Is Chain of Custody complete?      Yes       No       Not Present
2. How was the sample delivered?      UPS

**Log In**

3. Coolers are present?      Yes       No       NA
4. Shipping container/cooler in good condition?      Yes       No
5. Custody Seals present on shipping container/cooler?  
(Refer to comments for Custody Seals not intact)      Yes       No       Not Present
6. Was an attempt made to cool the samples?      Yes       No       NA
7. Were all items received at a temperature of >2°C to 6°C \*      Yes       No       NA
8. Sample(s) in proper container(s)?      Yes       No
9. Sufficient sample volume for indicated test(s)?      Yes       No
10. Are samples properly preserved?      Yes       No
11. Was preservative added to bottles?      Yes       No       NA
12. Is there headspace in the VOA vials?      Yes       No       NA
13. Did all samples containers arrive in good condition(unbroken)?      Yes       No
14. Does paperwork match bottle labels?      Yes       No
15. Are matrices correctly identified on Chain of Custody?      Yes       No
16. Is it clear what analyses were requested?      Yes       No
17. Were all holding times able to be met?      Yes       No

**Special Handling (if applicable)**

18. Was client notified of all discrepancies with this order?      Yes       No       NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:  
Jars for SS01 and SS02 arrived broken, transferred volume to new jars upon receipt.

**Item Information**

Item #	Temp °C
Sample	4.4

\* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L23D051**

23/4/25

### Sending Laboratory:

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

### Subcontracted Laboratory:

Fremont Analytical, Inc.  
3600 Fremont Ave N  
Seattle, WA 98103  
Phone: (206) 352-3790  
Fax:

Requested Turnaround (TAT) Std

**Project:** Solid Wood

Analysis	Comments
<b>Client Sample ID: WB-SO-SS01-0020</b> <i>Soil Sampled: 04/11/2023 09:00</i> Lab ID: L23D051-01 cPAH by 8270    REPORT TO MDL <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SS-SS02-0020</b> <i>Soil Sampled: 04/11/2023 09:15</i> Lab ID: L23D051-02 cPAH by 8270    REPORT TO MDL <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SS-SS03-0020</b> <i>Soil Sampled: 04/11/2023 09:30</i> Lab ID: L23D051-03 cPAH by 8270    REPORT TO MDL <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SS-SS04-0020</b> <i>Soil Sampled: 04/11/2023 09:45</i> Lab ID: L23D051-04 cPAH by 8270    REPORT TO MDL <i>Containers Supplied:</i>	

Released By [Signature]    Date 4.12.23  
[Signature]    Date 4.12.23

Received By [Signature]    Date 4/13/23





# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

February 2, 2023

Hannah Morse  
Pioneer Technologies Corporation  
5205 Corporate Center Ct SE, Suite C  
Lacey, WA 98503

Dear Hannah Morse:

Please find enclosed the analytical data report for the Solid Wood, Inc. project located in Olympia, Washington.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. The sample(s) will be disposed of within 30 days unless we are contacted to arrange long term storage.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

A handwritten signature in black ink, appearing to read "Sherry L. Chilcutt".

Sherry L. Chilcutt  
*Senior Chemist*  
*Libby Environmental, Inc.*

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# Libby Environmental, Inc.

# Chain of Custody Record

www.LibbyEnvironmental.com

3322 South Bay Road NE  
Olympia, WA 98506

Ph: 360-352-2110  
Fax: 360-352-4154

Date: 11-28-2022

Page: 1 of 1

Client: PIONEER Technologies Corporation

Project Manager: Hannah Morse

Address: 5205 Corporate Ctr Ct SE, Ste. A

Project Name: Solid Wood, Inc.

City: Olympia State: WA Zip: 98503

Location: 700 West Bay Dr NW City, State: Olympia WA

Phone: 360-570-1700

Fax:

Collector: HM

Date of Collection: 11-28-22

Client Project #

Email: morse.h@uspioneer.com



Sample Number	Depth	Time	Sample Type	Container Type	VOC 8260 PCE, Dioxin/Furan NWTPH-Gx BTEX (8260) / (8021) NWTPH-HCID NWTPH-Dx / Dx PCB 8082 MCHL, Metals PAHs, Metals c-PAH 8270 PAH 8270 Semi Vol 8270 Phenols/Phthalates 8270 TOC 9060A Grain Size PSEP 95													Field Notes		
					VOC 8260	PCE, Dioxin/Furan	NWTPH-Gx	BTEX (8260) / (8021)	NWTPH-HCID	NWTPH-Dx / Dx	PCB 8082	MCHL, Metals	PAHs, Metals	c-PAH 8270	PAH 8270	Semi Vol 8270	Phenols/Phthalates 8270		TOC 9060A	Grain Size PSEP 95
1 WB-SO-SD69-0005	0.5'	0930	SD		X	X			X	X	X	X	X	X	X	X	X	X	X	
2 WB-SO-SD68-0005	0.5'	0955			X	X			X	X	X	X	X	X	X	X	X	X	X	
3 WB-SO-SD67-0005	0.5'	1015			X	X			X	X	X	X	X	X	X	X	X	X	X	
4 WB-SO-SD66-0005	0.5'	1045			X	X			X	X	X	X	X	X	X	X	X	X	X	
5 WB-SO-SD65-0005	0.5'	1105			X	X			X	X	X	X	X	X	X	X	X	X	X	
6 WB-SO-SD60-0005	0.5'	1145			X	X	X		X	X	X	X	X	X	X	X	X	X	X	
7 WB-SO-SD60-0020	2.0'	1210			X	X			X	X	X	X	X	X	X	X	X	X	X	Hold For Dioxin/Furan
8 WB-SO-SD61-0005	0.5'	1242			X	X	X		X	X	X	X	X	X	X	X	X	X	X	
9 WB-SO-SD61-0020	2.0'	1310			X	X			X	X	X	X	X	X	X	X	X	X	X	Hold For Dioxin/Furan
10 WB-SO-SD62-0005	0.5'	1340			X	X	X		X	X	X	X	X	X	X	X	X	X	X	
11 WB-SO-SD62-0020	2.0'	1405			X	X			X	X	X	X	X	X	X	X	X	X	X	Hold For Dioxin/Furan
12 WB-SO-SD63-0005	0.5'	1430			X	X	X		X	X	X	X	X	X	X	X	X	X	X	
13 WB-SO-SD63-0020	2.0'	1445			X	X			X	X	X	X	X	X	X	X	X	X	X	Hold For Dioxin/Furan
14																				metals:
15																				arsenic, cadmium,
16																				chromium, copper,
17																				lead, silver, zinc)

Relinquished by: Hannah Morse	Date / Time 11/28	Received by: [Signature]	Date / Time 11/28 1621	<b>Sample Receipt</b> Good Condition? Y N Cooler Temp. 0.02 °C Sample Temp. 11.4 °C Total Number of Containers	Remarks:    TAT: 24HR 48HR <b>5-DAY</b>
Relinquished by:	Date / Time	Received by:	Date / Time		
Relinquished by:	Date / Time	Received by:	Date / Time		
Relinquished by:	Date / Time	Received by:	Date / Time		

LEGAL ACTION CLAUSE: In the event of default of payment and/or failure to pay, Client agrees to pay the costs of collection including court costs and reasonable attorney fees to be determined by a court of law.

Distribution: White - Lab, Yellow - Originator

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double-sided printing.

# Libby Environmental, Inc.

SOLID WOOD, INC. PROJECT  
 Pioneer Technologies Corporation  
 Olympia, Washington  
 Libby Project # L22K119

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Method Blank	WB-SO- SD69-0005	WB-SO- SD68-0005	WB-SO- SD67-0005	WB-SO- SD66-0005	WB-SO- SD65-0005
Date Sampled	Reporting	N/A	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.18	nd	nd	nd	nd	nd
Chloromethane	0.18	nd	nd	nd	nd	nd
Vinyl chloride	0.04	nd	nd	nd	nd	nd
Bromomethane	0.27	nd	nd	nd	nd	nd
Chloroethane	0.18	nd	nd	nd	nd	nd
Trichlorofluoromethane	0.15	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd	nd	nd
Methylene chloride	0.06	nd	nd	nd	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.15	nd	nd	nd	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.09	nd	nd	nd	nd	nd
2,2-Dichloropropane	0.15	nd	nd	nd	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd	nd
Chloroform	0.09	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.09	nd	nd	nd	nd	nd
Carbon tetrachloride	0.09	nd	nd	nd	nd	nd
1,1-Dichloropropene	0.09	nd *	nd *	nd *	nd *	nd *
Benzene	0.06	nd	nd	nd	nd	nd
1,2-Dichloroethane (EDC)	0.09	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.06	nd	nd	nd	nd	nd
1,2-Dichloropropane	0.09	nd	nd	nd	nd	nd
Dibromomethane	0.12	nd	nd	nd	nd	nd
Bromodichloromethane	0.09	nd	nd	nd	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.09	nd	nd	nd	nd	nd
Toluene	0.30	nd	nd	nd	nd	nd
<i>Trans</i> -1,3-Dichloropropene	0.09	nd *	nd *	nd *	nd *	nd *
1,1,2-Trichloroethane	0.09	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.09	nd	nd	nd	nd	nd
1,3-Dichloropropane	0.15	nd	nd	nd	nd	nd
Dibromochloromethane	0.09	nd	nd	nd	nd	nd
1,2-Dibromoethane (EDB)	0.015	nd	nd	nd	nd	nd
Chlorobenzene	0.09	nd	nd	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.15	nd	nd	nd	nd	nd
Total Xylenes	0.45	nd	nd	nd	nd	nd
Styrene	0.09	nd	nd	nd	nd	nd



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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Method Blank	WB-SO- SD69-0005	WB-SO- SD68-0005	WB-SO- SD67-0005	WB-SO- SD66-0005	WB-SO- SD65-0005
Date Sampled	Reporting	N/A	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Bromoform	0.45	nd	nd	nd	nd	nd
Isopropylbenzene	0.15	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.45	nd	nd	nd	nd	nd
Bromobenzene	0.12	nd	nd	nd	nd	nd
n-Propylbenzene	0.12	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	0.12	nd	nd	nd	nd	nd
2-Chlorotoluene	0.12	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.12	nd	nd	nd	nd	nd
4-Chlorotoluene	0.12	nd	nd	nd	nd	nd
tert-Butylbenzene	0.12	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.12	nd	nd	nd	nd	nd
sec-Butylbenzene	0.12	nd	nd	nd	nd	nd
p-Isopropyltoluene	0.12	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	0.12	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	0.12	nd	nd	nd	nd	nd
n-Butylbenzene	0.12	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	0.12	nd	nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.45	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	0.45	nd	nd	nd	nd	nd
Hexachloro-1,3-butadiene	0.45	nd	nd	nd	nd	nd
Naphthalene	0.45	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	0.45	nd	nd	nd	nd	nd
Surrogate Recovery	Acceptable Limits (%)					
Dibromofluoromethane	27-188	141	160	158	136	150
1,2-Dichloroethane-d4	17-212	112	119	120	110	113
Toluene-d8	41-142	84	86	83	70	87
4-Bromofluorobenzene	47-167	67	66	67	68	87

"nd" Indicates not detected at listed detection limit.

"\*" LCS Spike recovery is outside acceptance limits. Analyte concentration may be biased low.

"int" Indicates that interference prevents determination.

ANALYSES PERFORMED BY: Sherry Chilcutt

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description		WB-SO- SD60-0005	WB-SO- SD60-0020	WB-SO- SD61-0005	WB-SO- SD61-0020	WB-SO- SD62-0005	WB-SO- SD62-0005 Dup
Date Sampled	Reporting	11/28/2022	11/28/2022	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.18	nd	nd	nd	nd	nd	nd
Chloromethane	0.18	nd	nd	nd	nd	nd	nd
Vinyl chloride	0.04	nd	nd	nd	nd	nd	nd
Bromomethane	0.27	nd	nd	nd	nd	nd	nd
Chloroethane	0.18	nd	nd	nd	nd	nd	nd
Trichlorofluoromethane	0.15	nd	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd	nd	nd	nd
Methylene chloride	0.06	nd	nd	nd	nd	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.15	nd	nd	nd	nd	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.09	nd	nd	nd	nd	nd	nd
2,2-Dichloropropane	0.15	nd	nd	nd	nd	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd	nd	nd
Chloroform	0.09	nd	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.09	nd	nd	nd	nd	nd	nd
Carbon tetrachloride	0.09	nd	nd	nd	nd	nd	nd
1,1-Dichloropropene	0.09	nd *	nd *	nd *	nd *	nd *	nd *
Benzene	0.06	nd	nd	nd	nd	nd	nd
1,2-Dichloroethane (EDC)	0.09	nd	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.06	nd	nd	nd	nd	nd	nd
1,2-Dichloropropane	0.09	nd	nd	nd	nd	nd	nd
Dibromomethane	0.12	nd	nd	nd	nd	nd	nd
Bromodichloromethane	0.09	nd	nd	nd	nd	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.09	nd	nd	nd	nd	nd	nd
Toluene	0.30	nd	nd	nd	nd	nd	nd
<i>Trans</i> -1,3-Dichloropropene	0.09	nd *	nd *	nd *	nd *	nd *	nd *
1,1,2-Trichloroethane	0.09	nd	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.09	nd	nd	nd	nd	nd	nd
1,3-Dichloropropane	0.15	nd	nd	nd	nd	nd	nd
Dibromochloromethane	0.09	nd	nd	nd	nd	nd	nd
1,2-Dibromoethane (EDB)	0.015	nd	nd	nd	nd	nd	nd
Chlorobenzene	0.09	nd	nd	nd	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.15	nd	nd	nd	nd	nd	nd
Total Xylenes	0.45	nd	nd	nd	nd	nd	nd
Styrene	0.09	nd	nd	nd	nd	nd	nd

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description		WB-SO- SD60-0005	WB-SO- SD60-0020	WB-SO- SD61-0005	WB-SO- SD61-0020	WB-SO- SD62-0005	WB-SO- SD62-0005 Dup
Date Sampled	Reporting	11/28/2022	11/28/2022	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Bromoform	0.45	nd	nd	nd	nd	nd	nd
Isopropylbenzene	0.15	nd	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.45	nd	nd	nd	nd	nd	nd
Bromobenzene	0.12	nd	nd	nd	nd	nd	nd
n-Propylbenzene	0.12	nd	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	0.12	nd	nd	nd	nd	nd	nd
2-Chlorotoluene	0.12	nd	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.12	nd	nd	nd	nd	nd	nd
4-Chlorotoluene	0.12	nd	nd	nd	nd	nd	nd
tert-Butylbenzene	0.12	nd	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.12	nd	nd	nd	nd	nd	nd
sec-Butylbenzene	0.12	nd	nd	nd	nd	nd	nd
p-Isopropyltoluene	0.12	nd	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	0.12	nd	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	0.12	nd	nd	nd	nd	nd	nd
n-Butylbenzene	0.12	nd	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	0.12	nd	nd	nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.45	nd	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	0.45	nd	nd	nd	nd	nd	nd
Hexachloro-1,3-butadiene	0.45	nd	nd	nd	nd	nd	nd
Naphthalene	0.45	nd	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	0.45	nd	nd	nd	nd	nd	nd
Surrogate Recovery	Acceptable Limits (%)						
Dibromofluoromethane	27-188	133	119	155	135	121	117
1,2-Dichloroethane-d4	17-212	117	107	114	106	105	101
Toluene-d8	41-142	72	62	86	85	74	75
4-Bromofluorobenzene	47-167	66	67	72	66	67	68

"nd" Indicates not detected at listed detection limit.

"\*" LCS Spike recovery is outside acceptance limits. Analyte concentration may be biased low.

"int" Indicates that interference prevents determination.

ANALYSES PERFORMED BY: Sherry Chilcutt

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Reporting	WB-SO-	WB-SO-	WB-SO-	WB-SO-
		SD62-0020	SD63-0005	SD63-0020	SD63-0020 Dup
Date Sampled	Reporting	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.18	nd	nd	nd	nd
Chloromethane	0.18	nd	nd	nd	nd
Vinyl chloride	0.04	nd	nd	nd	nd
Bromomethane	0.27	nd	nd	nd	nd
Chloroethane	0.18	nd	nd	nd	nd
Trichlorofluoromethane	0.15	nd	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd	nd
Methylene chloride	0.06	nd	nd	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.15	nd	nd	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd
1,1-Dichloroethane	0.09	nd	nd	nd	nd
2,2-Dichloropropane	0.15	nd	nd	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd
Chloroform	0.09	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.09	nd	nd	nd	nd
Carbon tetrachloride	0.09	nd	nd	nd	nd
1,1-Dichloropropene	0.09	nd *	nd *	nd *	nd *
Benzene	0.06	nd	nd	nd	nd
1,2-Dichloroethane (EDC)	0.09	nd	nd	nd	nd
Trichloroethene (TCE)	0.06	nd	nd	nd	nd
1,2-Dichloropropane	0.09	nd	nd	nd	nd
Dibromomethane	0.12	nd	nd	nd	nd
Bromodichloromethane	0.09	nd	nd	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.09	nd	nd	nd	nd
Toluene	0.30	nd	nd	nd	nd
<i>Trans</i> -1,3-Dichloropropene	0.09	nd *	nd *	nd *	nd *
1,1,2-Trichloroethane	0.09	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.09	nd	nd	nd	nd
1,3-Dichloropropane	0.15	nd	nd	nd	nd
Dibromochloromethane	0.09	nd	nd	nd	nd
1,2-Dibromoethane (EDB)	0.015	nd	nd	nd	nd
Chlorobenzene	0.09	nd	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.15	nd	nd	nd	nd
Total Xylenes	0.45	nd	nd	nd	nd
Styrene	0.09	nd	nd	nd	nd

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description		WB-SO- SD62-0020	WB-SO- SD63-0005	WB-SO- SD63-0020	WB-SO- SD63-0020 Dup
Date Sampled	Reporting	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Bromoform	0.45	nd	nd	nd	nd
Isopropylbenzene	0.15	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.45	nd	nd	nd	nd
Bromobenzene	0.12	nd	nd	nd	nd
n-Propylbenzene	0.12	nd	nd	nd	nd
1,2,3-Trichloropropane	0.12	nd	nd	nd	nd
2-Chlorotoluene	0.12	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.12	nd	nd	nd	nd
4-Chlorotoluene	0.12	nd	nd	nd	nd
tert-Butylbenzene	0.12	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.12	nd	nd	nd	nd
sec-Butylbenzene	0.12	nd	nd	nd	nd
p-Isopropyltoluene	0.12	nd	nd	nd	nd
1,3-Dichlorobenzene	0.12	nd	nd	nd	nd
1,4-Dichlorobenzene	0.12	nd	nd	nd	nd
n-Butylbenzene	0.12	nd	nd	nd	nd
1,2-Dichlorobenzene	0.12	nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.45	nd	nd	nd	nd
1,2,4-Trichlorobenzene	0.45	nd	nd	nd	nd
Hexachloro-1,3-butadiene	0.45	nd	nd	nd	nd
Naphthalene	0.45	nd	nd	nd	nd
1,2,3-Trichlorobenzene	0.45	nd	nd	nd	nd
Surrogate Recovery	Acceptable Limits (%)				
Dibromofluoromethane	27-188	145	119	125	119
1,2-Dichloroethane-d4	17-212	95	110	111	104
Toluene-d8	41-142	85	71	67	66
4-Bromofluorobenzene	47-167	70	69	67	67

"nd" Indicates not detected at listed detection limit.

"\*" LCS Spike recovery is outside acceptance limits. Analyte concentration may be biased low.

"int" Indicates that interference prevents determination.

ANALYSES PERFORMED BY: Sherry Chilcutt



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## QA/QC for Volatile Organic Compounds by EPA Method 8260D in Soil

Matrix Spike Sample Identification: WB-SO-SD63-0020								
Date Analyzed: 12/2/2022								
	Spiked Conc. (mg/kg)	MS Response (mg/kg)	MSD Response (mg/kg)	MS Recovery (%)	MSD Recovery (%)	RPD (%)	Recovery Limits (%)	Data Flag
Dichlorodifluoromethane	0.25	0.20	0.20	81	79	2.9	10-223	
Chloromethane	0.25	0.21	0.19	86	75	13.3	10-226	
Vinyl chloride	0.25	0.20	0.19	81	76	6.3	10-208	
Bromomethane	0.25	0.21	0.19	83	78	6.7	29-205	
Chloroethane	0.25	0.21	0.18	83	73	13.0	10-245	
Trichlorofluoromethane	0.25	0.27	0.30	109	119	8.8	10-238	
1,1-Dichloroethene	0.25	0.30	0.29	122	114	6.3	50-187	
Methylene chloride	0.25	0.25	0.26	101	103	1.5	15-237	
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.25	0.24	0.21	97	85	13.1	35-156	
<i>trans</i> -1,2-Dichloroethene	0.25	0.25	0.24	99	97	1.8	38-175	
1,1-Dichloroethane	0.25	0.30	0.28	121	111	8.6	67-164	
2,2-Dichloropropane	0.25	0.34	0.32	138	129	6.2	75-162	
<i>cis</i> -1,2-Dichloroethene	0.25	0.26	0.25	106	99	6.6	33-166	
Chloroform	0.25	0.34	0.32	136	129	5.2	18-225	
1,1,1-Trichloroethane (TCA)	0.25	0.46	0.41	182	164	10.3	73-162	S
Carbon tetrachloride	0.25	0.53	0.49	210	198	6.3	70-175	S
1,1-Dichloropropene	0.25	0.32	0.26	128	105	19.4	55-121	S
Benzene	0.25	0.27	0.28	109	114	4.4	65-126	
1,2-Dichloroethane (EDC)	0.25	0.33	0.29	131	117	10.8	66-147	
Trichloroethene (TCE)	0.25	0.30	0.29	121	114	5.8	71-126	
1,2-Dichloropropane	0.25	0.24	0.21	98	85	13.9	55-146	
Dibromomethane	0.25	0.41	0.36	166	143	14.8	67-153	S
Bromodichloromethane	0.25	0.51	0.44	205	175	15.4	75-157	S
<i>cis</i> -1,3-Dichloropropene	0.25	0.20	0.16	79	64	20.3	32-130	
Toluene	0.25	0.26	0.23	103	92	11.4	67-136	
Trans-1,3-Dichloropropene	0.25	0.18	0.16	70	66	6.5	51-115	
1,1,2-Trichloroethane	0.25	0.38	0.32	151	128	16.7	61-157	
Tetrachloroethene (PCE)	0.25	0.38	0.36	154	143	7.6	45-166	
1,3-Dichloropropane	0.25	0.24	0.21	98	84	14.8	51-133	
Dibromochloromethane	0.25	0.60	0.51	239	202	16.7	61-157	S
1,2-Dibromoethane (EDB)	0.25	0.35	0.31	139	123	11.6	52-149	
Chlorobenzene	0.25	0.32	0.30	127	120	5.4	69-148	
Ethylbenzene	0.25	0.20	0.19	81	78	4.2	55-140	
1,1,1,2-Tetrachloroethane	0.25	0.53	0.50	213	198	7.4	70-173	S
Total Xylenes	0.75	0.62	0.59	83	79	4.4	43-149	
Styrene	0.25	0.20	0.19	81	77	5.5	40-139	

# Libby Environmental, Inc.

SOLID WOOD, INC. PROJECT  
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 Olympia, Washington  
 Libby Project # L22K119

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## QA/QC for Volatile Organic Compounds by EPA Method 8260D in Soil

Matrix Spike Sample Identification: WB-SO-SD63-0020								
Date Analyzed: 12/2/2022								
	Spiked Conc. (mg/kg)	MS Response (mg/kg)	MSD Response (mg/kg)	MS Recovery (%)	MSD Recovery (%)	RPD (%)	Recovery Limits (%)	Data Flag
Bromoform	0.25	0.88	0.76	353	303	15.3	16-220	S
Isopropylbenzene	0.25	0.18	0.17	71	69	3.3	31-151	
1,1,2,2-Tetrachloroethane	0.25	0.28	0.25	114	101	12.0	35-176	
Bromobenzene	0.25	0.25	0.26	102	102	0.2	65-138	
n-Propylbenzene	0.25	0.15	0.15	58	61	5.2	52-147	
1,2,3-Trichloropropane	0.25	0.30	0.28	121	111	9.3	48-172	
2-Chlorotoluene	0.25	0.15	0.16	60	62	4.2	53-138	
1,3,5-Trimethylbenzene	0.25	0.15	0.16	60	63	4.3	47-148	
4-Chlorotoluene	0.25	0.15	0.16	62	64	3.7	51-132	
tert-Butylbenzene	0.25	0.14	0.15	57	58	2.3	20-150	
1,2,4-Trimethylbenzene	0.25	0.14	0.15	58	60	4.6	47-144	
sec-Butylbenzene	0.25	0.17	0.16	67	65	2.7	49-147	
Isopropyltoluene	0.25	0.15	0.14	60	58	4.2	42-139	
1,3-Dichlorobenzene	0.25	0.28	0.28	112	110	1.1	68-143	
1,4-Dichlorobenzene	0.25	0.29	0.29	118	115	2.4	71-140	
n-Butylbenzene	0.25	0.13	0.12	51	47	7.6	38-148	
1,2-Dichlorobenzene	0.25	0.25	0.23	99	92	8.0	60-138	
1,2-Dibromo-3-Chloropropane	0.25	0.33	0.20	132	82	47.4	10-213	R
1,2,4-Trichlorobenzene	0.25	0.15	0.071	60	28	71.7	10-180	R
Hexachloro-1,3-butadiene	0.25	0.24	0.13	96	51	61.3	10-228	R
Naphthalene	0.25	0.10	0.10	42	40	5.8	10-180	
1,2,3-Trichlorobenzene	0.25	0.19	0.063	74	25	98.7	10-194	R
Surrogate Recovery (%)				MS	MSD			
Dibromofluoromethane				155	146		27-188	
1,2-Dichloroethane-d4				126	116		17-212	
Toluene-d8				86	81		41-142	
4-Bromofluorobenzene				93	92		47-167	

ACCEPTABLE RPD IS 35%

"S" Spike compound recovery is outside acceptance limits.

"R" High relative percent difference observed.

ANALYSES PERFORMED BY: Sherry Chilcutt

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## Laboratory Control Sample

Date Analyzed: 12/2/2022					
	Spiked Conc. (mg/kg)	LCS Response (mg/kg)	LCS Recovery (%)	Recovery Limits (%)	Data Flag
Dichlorodifluoromethane	0.25	0.19	76	10-236	
Chloromethane	0.25	0.15	59	10-229	
Vinyl chloride	0.25	0.14	55	15-226	
Bromomethane	0.25	0.21	86	50-183	
Chloroethane	0.25	0.40	158	26-324	
Trichlorofluoromethane	0.25	0.30	120	79-209	
1,1-Dichloroethene	0.25	0.22	86	38-193	
Methylene chloride	0.25	0.20	81	51-199	
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.25	0.21	85	43-147	
<i>trans</i> -1,2-Dichloroethene	0.25	0.19	77	53-156	
1,1-Dichloroethane	0.25	0.24	95	68-169	
2,2-Dichloropropane	0.25	0.25	101	50-196	
<i>cis</i> -1,2-Dichloroethene	0.25	0.18	74	10-219	
Chloroform	0.25	0.28	112	47-192	
1,1,1-Trichloroethane (TCA)	0.25	0.31	123	67-173	
Carbon tetrachloride	0.25	0.32	127	69-170	
1,1-Dichloropropene	0.25	0.14	58	61-113	L
Benzene	0.25	0.18	73	65-118	
1,2-Dichloroethane (EDC)	0.25	0.24	96	67-138	
Trichloroethene (TCE)	0.25	0.24	97	67-121	
1,2-Dichloropropane	0.25	0.20	79	51-140	
Dibromomethane	0.25	0.31	125	64-140	
Bromodichloromethane	0.25	0.37	150	67-153	
<i>cis</i> -1,3-Dichloropropene	0.25	0.16	63	56-105	
Toluene	0.25	0.19	78	68-125	
Trans-1,3-Dichloropropene	0.25	0.15	60	63-109	L
1,1,2-Trichloroethane	0.25	0.29	118	65-152	
Tetrachloroethene (PCE)	0.25	0.30	119	46-159	
1,3-Dichloropropane	0.25	0.20	81	62-121	
Dibromochloromethane	0.25	0.42	170	48-181	
1,2-Dibromoethane (EDB)	0.25	0.29	116	53-146	
Chlorobenzene	0.25	0.27	108	62-151	
Ethylbenzene	0.25	0.18	74	49-144	
1,1,1,2-Tetrachloroethane	0.25	0.39	158	53-197	
Total Xylenes	0.75	0.53	70	38-140	
Styrene	0.25	0.18	70	52-134	

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## Laboratory Control Sample

Date Analyzed: WB-SO-SD63-0020					
	Spiked Conc. (mg/kg)	LCS Response (mg/kg)	LCS Recovery (%)	Recovery Limits (%)	Data Flag
Bromoform	0.25	0.65	261	29-218	S
Isopropylbenzene	0.25	0.16	65	58-136	
1,1,2,2-Tetrachloroethane	0.25	0.31	124	55-168	
Bromobenzene	0.25	0.29	117	74-120	
n-Propylbenzene	0.25	0.19	77	64-120	
1,2,3-Trichloropropane	0.25	0.34	138	62-153	
2-Chlorotoluene	0.25	0.19	76	67-120	
1,3,5-Trimethylbenzene	0.25	0.20	80	61-124	
4-Chlorotoluene	0.25	0.20	80	65-116	
tert-Butylbenzene	0.25	0.20	78	56-128	
1,2,4-Trimethylbenzene	0.25	0.19	76	62-122	
sec-Butylbenzene	0.25	0.23	92	68-130	
Isopropyltoluene	0.25	0.20	81	55-132	
1,3-Dichlorobenzene	0.25	0.33	130	75-133	
1,4-Dichlorobenzene	0.25	0.34	136	83-128	S
n-Butylbenzene	0.25	0.17	69	62-125	
1,2-Dichlorobenzene	0.25	0.30	120	73-129	
1,2-Dibromo-3-Chloropropane	0.25	0.35	141	33-155	
1,2,4-Trichlorobenzene	0.25	0.21	82	62-145	
Hexachloro-1,3-butadiene	0.25	0.40	159	37-220	
Naphthalene	0.25	0.14	56	50-133	
1,2,3-Trichlorobenzene	0.25	0.27	110	70-159	
Surrogate Recovery					
Dibromofluoromethane			133	27-188	
1,2-Dichloroethane-d4			108	17-212	
Toluene-d8			90	41-142	
4-Bromofluorobenzene			93	47-167	

"S" Spike compound recovery is outside acceptance limits (High Bias). Samples will be qualified with a \*.

"L" Spike recovery is outside acceptance limits (Low Bias). Samples will be qualified with a \*.

ANALYSES PERFORMED BY: Sherry Chilcutt

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SOLID WOOD, INC. PROJECT  
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Libby Project # L22K119

## Analyses of Gasoline (NWTPH-Gx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)
Method Blank	12/2/2022	84	nd
WB-SO-SD69-0005	12/2/2022	86	nd
WB-SO-SD68-0005	12/2/2022	83	nd
WB-SO-SD67-0005	12/2/2022	70	nd
WB-SO-SD66-0005	12/1/2022	90	nd
WB-SO-SD65-0005	12/2/2022	84	nd
WB-SO-SD60-0005	12/2/2022	72	nd
WB-SO-SD60-0020	12/2/2022	62	nd
WB-SO-SD61-0005	12/2/2022	86	nd
WB-SO-SD61-0020	12/2/2022	85	nd
WB-SO-SD62-0005	12/2/2022	74	nd
WB-SO-SD62-0005 Dup	12/2/2022	75	nd
WB-SO-SD62-0020	12/2/2022	85	nd
WB-SO-SD63-0005	12/2/2022	71	nd
WB-SO-SD63-0020	12/2/2022	67	nd
WB-SO-SD63-0020 Dup	12/2/2022	66	nd
Practical Quantitation Limit			30

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 41% TO 142%

ANALYSES PERFORMED BY: Sherry Chilcutt



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SOLID WOOD, INC. PROJECT

Pioneer Technologies Corp.

Olympia, Washington

Libby Project # L22K119

## Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)	Oil (mg/kg)
Method Blank	11/30/2022	89	nd	nd
WB-SO-SD69-0005	11/30/2022	93	nd	nd
WB-SO-SD69-0005 Dup	11/30/2022	92	nd	nd
WB-SO-SD68-0005	11/30/2022	111	nd	nd
WB-SO-SD67-0005	11/30/2022	101	nd	nd
WB-SO-SD66-0005	11/30/2022	87	nd	nd
WB-SO-SD65-0005	11/30/2022	98	nd	nd
WB-SO-SD60-0005	11/30/2022	87	nd	nd
WB-SO-SD60-0020	11/30/2022	97	nd	nd
WB-SO-SD61-0005	11/30/2022	90	nd	nd
WB-SO-SD61-0020	11/30/2022	98	nd	nd
WB-SO-SD62-0005	11/30/2022	102	nd	nd
WB-SO-SD62-0020	11/30/2022	102	nd	nd
WB-SO-SD63-0005	11/30/2022	91	nd	nd
WB-SO-SD63-0020	11/30/2022	98	nd	nd
WB-SO-SD63-0020 Dup	11/30/2022	97	nd	nd
Practical Quantitation Limit			50	250

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Lucy Owens

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## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	Method Blank	LCS	WB-SO- SD69-0005	WB-SO- SD69-0005 Dup	WB-SO- SD68-0005	WB-SO- SD67-0005
Date Sampled		N/A	N/A	1/0/1900	1/0/1900	1/0/1900	1/0/1900
Date Analyzed		11/30/2022	11/30/2022	11/30/2022	11/30/2022	11/30/2022	11/30/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	nd	99%	nd	nd	nd	nd
Aroclor 1221	0.1	nd		nd	nd	nd	nd
Aroclor 1232	0.1	nd		nd	nd	nd	nd
Aroclor 1242	0.1	nd		nd	nd	nd	nd
Aroclor 1248	0.1	nd		nd	nd	nd	nd
Aroclor 1254	0.1	nd		nd	nd	nd	nd
Aroclor 1260	0.1	nd	107%	nd	nd	nd	nd

### Surrogate Recovery

TCMX	97	98	99	118	80	95
DCBP	87	120	114	89	92	87

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Mathew Hansen

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## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	WB-SO- SD66-0005	WB-SO- SD65-0005	WB-SO- SD60-0005	WB-SO- SD60-0020	WB-SO- SD61-0005	WB-SO- SD61-0020
Date Sampled		1/0/1900	1/0/1900	1/0/1900	1/0/1900	11/28/2022	11/28/2022
Date Analyzed		11/30/2022	11/30/2022	11/30/2022	11/30/2022	11/30/2022	11/30/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	nd	nd	nd	nd	nd	nd
Aroclor 1221	0.1	nd	nd	nd	nd	nd	nd
Aroclor 1232	0.1	nd	nd	nd	nd	nd	nd
Aroclor 1242	0.1	nd	nd	nd	nd	nd	nd
Aroclor 1248	0.1	nd	nd	nd	nd	nd	nd
Aroclor 1254	0.1	nd	nd	nd	nd	nd	nd
Aroclor 1260	0.1	nd	nd	nd	nd	nd	nd

### Surrogate Recovery

TCMX	93	97	104	102	119	110
DCBP	100	80	104	78	115	122

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Mathew Hansen

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## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	WB-SO- SD62-0005	WB-SO- SD62-0020	WB-SO- SD62-0020 Dup	WB-SO- SD63-0005	WB-SO- SD63-0020
Date Sampled		11/28/2022	11/28/2022	11/28/2022	11/28/2022	11/28/2022
Date Analyzed		11/30/2022	11/30/2022	11/30/2022	11/30/2022	11/30/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	nd	nd	nd	nd	nd
Aroclor 1221	0.1	nd	nd	nd	nd	nd
Aroclor 1232	0.1	nd	nd	nd	nd	nd
Aroclor 1242	0.1	nd	nd	nd	nd	nd
Aroclor 1248	0.1	nd	nd	nd	nd	nd
Aroclor 1254	0.1	nd	nd	nd	nd	nd
Aroclor 1260	0.1	nd	nd	nd	nd	nd

### Surrogate Recovery

TCMX	90	85	93	106	95
DCBP	119	109	92	99	86

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Mathew Hansen

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## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	WB-SO- SD69-0005 MS	WB-SO- SD69-0005 MSD	RPD
Date Sampled		11/28/2022	11/28/2022	
Date Analyzed		11/30/2022	11/30/2022	
	(mg/kg)	(mg/kg)	(mg/kg)	
Aroclor 1016	0.1	102%	102%	0%
Aroclor 1221	0.1			
Aroclor 1232	0.1			
Aroclor 1242	0.1			
Aroclor 1248	0.1			
Aroclor 1254	0.1			
Aroclor 1260	0.1	100%	102%	2%
<b>Surrogate Recovery</b>				
TCMX		131	134	
DCBP		99	112	

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Mathew Hansen



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SOLID WOOD, INC. PROJECT  
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Libby Project # L22K119

## Analyses of Total Mercury in Soil by EPA Method 7471

Sample Number	Date Analyzed	Mercury (mg/kg)
Method Blank	12/1/2022	nd
WB-SO-SD69-0005	12/1/2022	nd
WB-SO-SD69-0005 Dup	12/1/2022	nd
WB-SO-SD68-0005	12/1/2022	nd
WB-SO-SD67-0005	12/1/2022	nd
WB-SO-SD66-0005	12/1/2022	nd
WB-SO-SD65-0005	12/1/2022	nd
WB-SO-SD60-0005	12/1/2022	nd
WB-SO-SD60-0020	12/1/2022	nd
WB-SO-SD61-0005	12/1/2022	nd
WB-SO-SD61-0020	12/1/2022	nd
WB-SO-SD62-0005	12/1/2022	nd
WB-SO-SD62-0020	12/1/2022	nd
WB-SO-SD63-0005	12/1/2022	nd
WB-SO-SD63-0005 Dup	12/1/2022	nd
WB-SO-SD63-0020	12/1/2022	nd

Practical Quantitation Limit 0.5

"nd" Indicates not detected at the listed detection limits.

ANALYSES PERFORMED BY: Randolph Kraus

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## QA/QC for Total Mercury by EPA Method 7471

Sample Number	Date Analyzed	Mercury (% Recovery)
LCS	12/1/2022	88%
WB-SO-SD69-0005 MS	12/1/2022	83%
WB-SO-SD69-0005 MSD	12/1/2022	85%
RPD	12/1/2022	2%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Randolph Kraus

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SOLID WOOD, INC. PROJECT  
Pioneer Technologies Corp.  
Libby Project # L22K119  
Date Received 11/28/22 16:21

Received By KD

## Sample Receipt Checklist

### Chain of Custody

1. Is the Chain of Custody complete?  Yes  No
2. How was the sample delivered?  Hand Delivered  Picked Up  Shipped

### Log In

3. Cooler or Shipping Container is present.  Yes  No  N/A
4. Cooler or Shipping Container is in good condition.  Yes  No  N/A
5. Cooler or Shipping Container has Custody Seals present.  Yes  No  N/A
6. Was an attempt made to cool the samples?  Yes  No  N/A
7. Temperature of cooler (0°C to 8°C recommended) 1.8 °C
8. Temperature of sample(s) (0°C to 8°C recommended) 3.3 °C
9. Did all containers arrive in good condition (unbroken)?  Yes  No
10. Is it clear what analyses were requested?  Yes  No
11. Did container labels match Chain of Custody?  Yes  No
12. Are matrices correctly identified on Chain of Custody?  Yes  No
13. Are correct containers used for the analysis indicated?  Yes  No
14. Is there sufficient sample volume for indicated analysis?  Yes  No
15. Were all containers properly preserved per each analysis?  Yes  No
16. Were VOA vials collected correctly (no headspace)?  Yes  No  N/A
17. Were all holding times able to be met?  Yes  No

### Discrepancies/ Notes

18. Was client notified of all discrepancies?  Yes  No  N/A

Person Notified: Hannah

Date: 11/29/2022

By Whom: JA

Via: email

Regarding: Analyses Clarification

19. Comments. VOAs prep-preserved w/ 4 mL MeOH.

Report 8270 to MDL, report all isomers/congeners of dioxins/furans



3600 Fremont Ave. N.  
Seattle, WA 98103  
T: (206) 352-3790  
F: (206) 352-7178  
info@fremontanalytical.com

**Libby Environmental**  
Sherry Chilcutt  
3322 South Bay Road NE  
Olympia, WA 98506

**RE: Solid Wood Inc**  
**Work Order Number: 2211603**

February 01, 2023

**Attention Sherry Chilcutt:**

Fremont Analytical, Inc. received 13 sample(s) on 11/30/2022 for the analyses presented in the following report.

- Grain Size by ASTM D422***
- Sample Moisture (Percent Moisture)***
- Semivolatile Organic Compounds by EPA Method 8270***
- Total Metals by EPA Method 6020B***
- Total Organic Carbon by EPA 9060***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing  
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing  
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

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Original



**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc  
**Work Order:** 2211603

## Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2211603-001	WB-SO-SD69-0005	11/28/2022 9:30 AM	11/30/2022 11:42 AM
2211603-002	WB-SO-SD68-0005	11/28/2022 9:55 AM	11/30/2022 11:42 AM
2211603-003	WB-SO-SD67-0005	11/28/2022 10:15 AM	11/30/2022 11:42 AM
2211603-004	WB-SO-SD66-0005	11/28/2022 10:45 AM	11/30/2022 11:42 AM
2211603-005	WB-SO-SD65-0005	11/28/2022 11:05 AM	11/30/2022 11:42 AM
2211603-006	WB-SO-SD60-0005	11/28/2022 11:45 AM	11/30/2022 11:42 AM
2211603-007	WB-SO-SD60-0020	11/28/2022 12:10 PM	11/30/2022 11:42 AM
2211603-008	WB-SO-SD61-0005	11/28/2022 12:42 PM	11/30/2022 11:42 AM
2211603-009	WB-SO-SD61-0020	11/28/2022 1:10 PM	11/30/2022 11:42 AM
2211603-010	WB-SO-SD62-0005	11/28/2022 1:40 PM	11/30/2022 11:42 AM
2211603-011	WB-SO-SD62-0020	11/28/2022 2:05 PM	11/30/2022 11:42 AM
2211603-012	WB-SO-SD63-0005	11/28/2022 2:30 PM	11/30/2022 11:42 AM
2211603-013	WB-SO-SD63-0020	11/28/2022 2:45 PM	11/30/2022 11:42 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned



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**CLIENT:** Libby Environmental**Project:** Solid Wood Inc

---

**I. SAMPLE RECEIPT:**

Samples receipt information is recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

2211603-001B

PHY-GRAIN has been Sub Contracted.

2211603-002B

PHY-GRAIN has been Sub Contracted.

2211603-003B

PHY-GRAIN has been Sub Contracted.

2211603-004B

PHY-GRAIN has been Sub Contracted.

2211603-005B

PHY-GRAIN has been Sub Contracted.

2211603-006B

PHY-GRAIN has been Sub Contracted.

2211603-007B

PHY-GRAIN has been Sub Contracted.

2211603-008B

PHY-GRAIN has been Sub Contracted.

2211603-009B

PHY-GRAIN has been Sub Contracted.

2211603-010B

PHY-GRAIN has been Sub Contracted.

2211603-011B

PHY-GRAIN has been Sub Contracted.

2211603-012B

PHY-GRAIN has been Sub Contracted.

2211603-013B

PHY-GRAIN has been Sub Contracted.

### Qualifiers:

- \* - Associated LCS is outside of control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Method Detection Limit
- R - High relative percent difference observed

### Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-001  
**Client Sample ID:** WB-SO-SD69-0005

**Collection Date:** 11/28/2022 9:30:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	58.0	15.3		µg/Kg-dry	1	12/14/22 4:01:18
Bis(2-chloroethyl) ether	ND	96.7	29.6		µg/Kg-dry	1	12/14/22 4:01:18
2-Chlorophenol	ND	77.4	27.9		µg/Kg-dry	1	12/14/22 4:01:18
1,3-Dichlorobenzene	ND	77.4	31.7		µg/Kg-dry	1	12/14/22 4:01:18
1,4-Dichlorobenzene	ND	58.0	25.0		µg/Kg-dry	1	12/14/22 4:01:18
1,2-Dichlorobenzene	ND	77.4	25.6		µg/Kg-dry	1	12/14/22 4:01:18
Benzyl alcohol	ND	290	111	Q	µg/Kg-dry	1	12/14/22 4:01:18
2-Methylphenol (o-cresol)	ND	77.4	30.2		µg/Kg-dry	1	12/14/22 4:01:18
Hexachloroethane	ND	77.4	24.3		µg/Kg-dry	1	12/14/22 4:01:18
N-Nitrosodi-n-propylamine	ND	155	53.1		µg/Kg-dry	1	12/14/22 4:01:18
3&4-Methylphenol (m, p-cresol)	ND	58.0	25.0		µg/Kg-dry	1	12/14/22 4:01:18
Nitrobenzene	ND	96.7	29.6		µg/Kg-dry	1	12/14/22 4:01:18
Isophorone	ND	77.4	25.3		µg/Kg-dry	1	12/14/22 4:01:18
2-Nitrophenol	ND	58.0	24.8		µg/Kg-dry	1	12/14/22 4:01:18
2,4-Dimethylphenol	ND	58.0	11.3		µg/Kg-dry	1	12/14/22 4:01:18
Bis(2-chloroethoxy)methane	ND	58.0	11.0		µg/Kg-dry	1	12/14/22 4:01:18
2,4-Dichlorophenol	ND	58.0	8.53		µg/Kg-dry	1	12/14/22 4:01:18
1,2,4-Trichlorobenzene	ND	58.0	21.7		µg/Kg-dry	1	12/14/22 4:01:18
Naphthalene	ND	77.4	23.6		µg/Kg-dry	1	12/14/22 4:01:18
4-Chloroaniline	ND	58.0	17.2		µg/Kg-dry	1	12/14/22 4:01:18
Hexachlorobutadiene	ND	58.0	16.8		µg/Kg-dry	1	12/14/22 4:01:18
4-Chloro-3-methylphenol	ND	58.0	22.1	Q	µg/Kg-dry	1	12/14/22 4:01:18
2-Methylnaphthalene	ND	58.0	14.2		µg/Kg-dry	1	12/14/22 4:01:18
1-Methylnaphthalene	ND	58.0	9.93		µg/Kg-dry	1	12/14/22 4:01:18
Hexachlorocyclopentadiene	ND	193	42.9	Q	µg/Kg-dry	1	12/14/22 4:01:18
2,4,6-Trichlorophenol	ND	58.0	24.5		µg/Kg-dry	1	12/14/22 4:01:18
2,4,5-Trichlorophenol	ND	58.0	17.1		µg/Kg-dry	1	12/14/22 4:01:18
2-Chloronaphthalene	ND	58.0	12.3		µg/Kg-dry	1	12/14/22 4:01:18
2-Nitroaniline	ND	96.7	38.4		µg/Kg-dry	1	12/14/22 4:01:18
Acenaphthene	ND	58.0	13.5		µg/Kg-dry	1	12/14/22 4:01:18
Dimethylphthalate	ND	6,770	3,120		µg/Kg-dry	1	12/14/22 4:01:18

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-001  
**Client Sample ID:** WB-SO-SD69-0005

**Collection Date:** 11/28/2022 9:30:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	77.4	28.0		µg/Kg-dry	1	12/14/22 4:01:18
Acenaphthylene	ND	58.0	12.1		µg/Kg-dry	1	12/14/22 4:01:18
2,4-Dinitrophenol	ND	580	249	Q	µg/Kg-dry	1	12/14/22 4:01:18
Dibenzofuran	ND	58.0	11.6		µg/Kg-dry	1	12/14/22 4:01:18
2,4-Dinitrotoluene	ND	116	46.9		µg/Kg-dry	1	12/14/22 4:01:18
4-Nitrophenol	ND	387	104	Q	µg/Kg-dry	1	12/14/22 4:01:18
Fluorene	ND	58.0	9.67		µg/Kg-dry	1	12/14/22 4:01:18
4-Chlorophenyl phenyl ether	ND	58.0	15.7		µg/Kg-dry	1	12/14/22 4:01:18
Diethylphthalate	ND	1,450	465		µg/Kg-dry	1	12/14/22 4:01:18
4,6-Dinitro-2-methylphenol	ND	484	212		µg/Kg-dry	1	12/14/22 4:01:18
4-Bromophenyl phenyl ether	ND	58.0	22.8		µg/Kg-dry	1	12/14/22 4:01:18
Hexachlorobenzene	ND	58.0	11.3		µg/Kg-dry	1	12/14/22 4:01:18
Pentachlorophenol	ND	387	139	Q	µg/Kg-dry	1	12/14/22 4:01:18
Phenanthrene	ND	58.0	15.3		µg/Kg-dry	1	12/14/22 4:01:18
Anthracene	ND	58.0	10.7		µg/Kg-dry	1	12/14/22 4:01:18
Carbazole	ND	58.0	12.5		µg/Kg-dry	1	12/14/22 4:01:18
Di-n-butylphthalate	ND	58.0	20.9		µg/Kg-dry	1	12/14/22 4:01:18
Fluoranthene	28.4	58.0	17.1	J	µg/Kg-dry	1	12/14/22 4:01:18
Pyrene	ND	290	92.5		µg/Kg-dry	1	12/14/22 4:01:18
Butyl Benzylphthalate	ND	96.7	28.5		µg/Kg-dry	1	12/14/22 4:01:18
bis(2-Ethylhexyl)adipate	ND	387	142		µg/Kg-dry	1	12/14/22 4:01:18
Benz(a)anthracene	21.0	58.0	15.7	J	µg/Kg-dry	1	12/14/22 4:01:18
Chrysene	23.1	96.7	22.2	J	µg/Kg-dry	1	12/14/22 4:01:18
bis (2-Ethylhexyl) phthalate	ND	77.4	21.8	Q	µg/Kg-dry	1	12/14/22 4:01:18
Di-n-octyl phthalate	ND	145	36.1		µg/Kg-dry	1	12/14/22 4:01:18
Benzo(b)fluoranthene	ND	193	20.5		µg/Kg-dry	1	12/14/22 4:01:18
Benzo(k)fluoranthene	ND	58.0	19.4		µg/Kg-dry	1	12/14/22 4:01:18
Benzo(a)pyrene	ND	77.4	28.1		µg/Kg-dry	1	12/14/22 4:01:18
Indeno(1,2,3-cd)pyrene	ND	387	134	Q	µg/Kg-dry	1	12/14/22 4:01:18
Dibenz(a,h)anthracene	ND	193	75.3		µg/Kg-dry	1	12/14/22 4:01:18
Benzo(g,h,i)perylene	ND	193	56.0	Q*	µg/Kg-dry	1	12/14/22 4:01:18

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-001  
**Client Sample ID:** WB-SO-SD69-0005

**Collection Date:** 11/28/2022 9:30:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	73.3	16.2 - 150	0		%Rec	1	12/14/22 4:01:18
Surr: 2-Fluorobiphenyl	73.7	25.3 - 139	0		%Rec	1	12/14/22 4:01:18
Surr: Nitrobenzene-d5	68.2	12.7 - 143	0		%Rec	1	12/14/22 4:01:18
Surr: Phenol-d6	65.4	21.4 - 139	0		%Rec	1	12/14/22 4:01:18
Surr: p-Terphenyl	73.6	37.1 - 144	0		%Rec	1	12/14/22 4:01:18

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.  
\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	7.56	0.505	0.147		mg/Kg-dry	1	12/02/22 16:25:09
Cadmium	0.502	0.336	0.0128		mg/Kg-dry	1	12/02/22 16:25:09
Chromium	27.4	0.925	0.220		mg/Kg-dry	1	12/02/22 16:25:09
Copper	40.3	1.85	0.315		mg/Kg-dry	1	12/02/22 16:25:09
Lead	9.22	0.505	0.0700		mg/Kg-dry	1	12/02/22 16:25:09
Silver	0.151	0.168	0.0347	J	mg/Kg-dry	1	12/02/22 16:25:09
Zinc	70.8	2.94	1.03		mg/Kg-dry	1	12/02/22 16:25:09

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	55.0	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38800 Analyst: AT

Total Organic Carbon	2.40	0.150	0.0412		%-dry	1	12/12/22 14:43:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 9:55:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD68-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Phenol	ND	69.9	18.4		µg/Kg-dry	1	12/14/22 4:31:06
Bis(2-chloroethyl) ether	ND	116	35.7		µg/Kg-dry	1	12/14/22 4:31:06
2-Chlorophenol	ND	93.2	33.6		µg/Kg-dry	1	12/14/22 4:31:06
1,3-Dichlorobenzene	ND	93.2	38.2		µg/Kg-dry	1	12/14/22 4:31:06
1,4-Dichlorobenzene	ND	69.9	30.1		µg/Kg-dry	1	12/14/22 4:31:06
1,2-Dichlorobenzene	ND	93.2	30.9		µg/Kg-dry	1	12/14/22 4:31:06
Benzyl alcohol	ND	349	134	Q	µg/Kg-dry	1	12/14/22 4:31:06
2-Methylphenol (o-cresol)	ND	93.2	36.3		µg/Kg-dry	1	12/14/22 4:31:06
Hexachloroethane	ND	93.2	29.3		µg/Kg-dry	1	12/14/22 4:31:06
N-Nitrosodi-n-propylamine	ND	186	64.0		µg/Kg-dry	1	12/14/22 4:31:06
3&4-Methylphenol (m, p-cresol)	ND	69.9	30.1		µg/Kg-dry	1	12/14/22 4:31:06
Nitrobenzene	ND	116	35.6		µg/Kg-dry	1	12/14/22 4:31:06
Isophorone	ND	93.2	30.4		µg/Kg-dry	1	12/14/22 4:31:06
2-Nitrophenol	ND	69.9	29.9		µg/Kg-dry	1	12/14/22 4:31:06
2,4-Dimethylphenol	ND	69.9	13.6		µg/Kg-dry	1	12/14/22 4:31:06
Bis(2-chloroethoxy)methane	ND	69.9	13.2		µg/Kg-dry	1	12/14/22 4:31:06
2,4-Dichlorophenol	ND	69.9	10.3		µg/Kg-dry	1	12/14/22 4:31:06
1,2,4-Trichlorobenzene	ND	69.9	26.2		µg/Kg-dry	1	12/14/22 4:31:06
Naphthalene	ND	93.2	28.5		µg/Kg-dry	1	12/14/22 4:31:06
4-Chloroaniline	ND	69.9	20.8		µg/Kg-dry	1	12/14/22 4:31:06
Hexachlorobutadiene	ND	69.9	20.3		µg/Kg-dry	1	12/14/22 4:31:06
4-Chloro-3-methylphenol	ND	69.9	26.6	Q	µg/Kg-dry	1	12/14/22 4:31:06
2-Methylnaphthalene	ND	69.9	17.1		µg/Kg-dry	1	12/14/22 4:31:06
1-Methylnaphthalene	ND	69.9	12.0		µg/Kg-dry	1	12/14/22 4:31:06
Hexachlorocyclopentadiene	ND	233	51.7	Q	µg/Kg-dry	1	12/14/22 4:31:06
2,4,6-Trichlorophenol	ND	69.9	29.5		µg/Kg-dry	1	12/14/22 4:31:06
2,4,5-Trichlorophenol	ND	69.9	20.6		µg/Kg-dry	1	12/14/22 4:31:06
2-Chloronaphthalene	ND	69.9	14.8		µg/Kg-dry	1	12/14/22 4:31:06
2-Nitroaniline	ND	116	46.3		µg/Kg-dry	1	12/14/22 4:31:06
Acenaphthene	ND	69.9	16.3		µg/Kg-dry	1	12/14/22 4:31:06
Dimethylphthalate	ND	8,150	3,760		µg/Kg-dry	1	12/14/22 4:31:06

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-002  
**Client Sample ID:** WB-SO-SD68-0005

**Collection Date:** 11/28/2022 9:55:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	93.2	33.7		µg/Kg-dry	1	12/14/22 4:31:06
Acenaphthylene	ND	69.9	14.6		µg/Kg-dry	1	12/14/22 4:31:06
2,4-Dinitrophenol	ND	699	300	Q	µg/Kg-dry	1	12/14/22 4:31:06
Dibenzofuran	ND	69.9	13.9		µg/Kg-dry	1	12/14/22 4:31:06
2,4-Dinitrotoluene	ND	140	56.5		µg/Kg-dry	1	12/14/22 4:31:06
4-Nitrophenol	ND	466	126	Q	µg/Kg-dry	1	12/14/22 4:31:06
Fluorene	ND	69.9	11.6		µg/Kg-dry	1	12/14/22 4:31:06
4-Chlorophenyl phenyl ether	ND	69.9	18.9		µg/Kg-dry	1	12/14/22 4:31:06
Diethylphthalate	ND	1,750	560		µg/Kg-dry	1	12/14/22 4:31:06
4,6-Dinitro-2-methylphenol	ND	582	256		µg/Kg-dry	1	12/14/22 4:31:06
4-Bromophenyl phenyl ether	ND	69.9	27.4		µg/Kg-dry	1	12/14/22 4:31:06
Hexachlorobenzene	ND	69.9	13.6		µg/Kg-dry	1	12/14/22 4:31:06
Pentachlorophenol	ND	466	167	Q	µg/Kg-dry	1	12/14/22 4:31:06
Phenanthrene	22.9	69.9	18.4	J	µg/Kg-dry	1	12/14/22 4:31:06
Anthracene	ND	69.9	12.9		µg/Kg-dry	1	12/14/22 4:31:06
Carbazole	ND	69.9	15.1		µg/Kg-dry	1	12/14/22 4:31:06
Di-n-butylphthalate	ND	69.9	25.2		µg/Kg-dry	1	12/14/22 4:31:06
Fluoranthene	42.7	69.9	20.6	J	µg/Kg-dry	1	12/14/22 4:31:06
Pyrene	ND	349	111		µg/Kg-dry	1	12/14/22 4:31:06
Butyl Benzylphthalate	ND	116	34.3		µg/Kg-dry	1	12/14/22 4:31:06
bis(2-Ethylhexyl)adipate	ND	466	171		µg/Kg-dry	1	12/14/22 4:31:06
Benz(a)anthracene	ND	69.9	18.9		µg/Kg-dry	1	12/14/22 4:31:06
Chrysene	ND	116	26.8		µg/Kg-dry	1	12/14/22 4:31:06
bis (2-Ethylhexyl) phthalate	ND	93.2	26.2	Q	µg/Kg-dry	1	12/14/22 4:31:06
Di-n-octyl phthalate	ND	175	43.5		µg/Kg-dry	1	12/14/22 4:31:06
Benzo(b)fluoranthene	ND	233	24.7		µg/Kg-dry	1	12/14/22 4:31:06
Benzo(k)fluoranthene	ND	69.9	23.4		µg/Kg-dry	1	12/14/22 4:31:06
Benzo(a)pyrene	ND	93.2	33.9		µg/Kg-dry	1	12/14/22 4:31:06
Indeno(1,2,3-cd)pyrene	ND	466	161	Q	µg/Kg-dry	1	12/14/22 4:31:06
Dibenz(a,h)anthracene	ND	233	90.6		µg/Kg-dry	1	12/14/22 4:31:06
Benzo(g,h,i)perylene	ND	233	67.4	Q*	µg/Kg-dry	1	12/14/22 4:31:06

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-002  
**Client Sample ID:** WB-SO-SD68-0005

**Collection Date:** 11/28/2022 9:55:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	68.3	16.2 - 150	0		%Rec	1	12/14/22 4:31:06
Surr: 2-Fluorobiphenyl	70.0	25.3 - 139	0		%Rec	1	12/14/22 4:31:06
Surr: Nitrobenzene-d5	63.8	12.7 - 143	0		%Rec	1	12/14/22 4:31:06
Surr: Phenol-d6	62.1	21.4 - 139	0		%Rec	1	12/14/22 4:31:06
Surr: p-Terphenyl	67.3	37.1 - 144	0		%Rec	1	12/14/22 4:31:06

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.  
\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	8.27	0.616	0.180		mg/Kg-dry	1	12/02/22 16:27:53
Cadmium	0.410	0.411	0.0156	J	mg/Kg-dry	1	12/02/22 16:27:53
Chromium	34.9	1.13	0.268		mg/Kg-dry	1	12/02/22 16:27:53
Copper	52.0	2.26	0.384		mg/Kg-dry	1	12/02/22 16:27:53
Lead	10.6	0.616	0.0854		mg/Kg-dry	1	12/02/22 16:27:53
Silver	0.163	0.205	0.0423	J	mg/Kg-dry	1	12/02/22 16:27:53
Zinc	80.2	3.59	1.25		mg/Kg-dry	1	12/02/22 16:27:53

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	62.3	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38800 Analyst: AT

Total Organic Carbon	3.06	0.150	0.0412		%-dry	1	12/12/22 14:59:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 10:15:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD67-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	53.9	14.2		µg/Kg-dry	1	12/14/22 5:00:53
Bis(2-chloroethyl) ether	ND	89.9	27.5		µg/Kg-dry	1	12/14/22 5:00:53
2-Chlorophenol	ND	71.9	26.0		µg/Kg-dry	1	12/14/22 5:00:53
1,3-Dichlorobenzene	ND	71.9	29.4		µg/Kg-dry	1	12/14/22 5:00:53
1,4-Dichlorobenzene	ND	53.9	23.2		µg/Kg-dry	1	12/14/22 5:00:53
1,2-Dichlorobenzene	ND	71.9	23.8		µg/Kg-dry	1	12/14/22 5:00:53
Benzyl alcohol	ND	270	103	Q	µg/Kg-dry	1	12/14/22 5:00:53
2-Methylphenol (o-cresol)	ND	71.9	28.0		µg/Kg-dry	1	12/14/22 5:00:53
Hexachloroethane	ND	71.9	22.6		µg/Kg-dry	1	12/14/22 5:00:53
N-Nitrosodi-n-propylamine	ND	144	49.4		µg/Kg-dry	1	12/14/22 5:00:53
3&4-Methylphenol (m, p-cresol)	ND	53.9	23.2		µg/Kg-dry	1	12/14/22 5:00:53
Nitrobenzene	ND	89.9	27.5		µg/Kg-dry	1	12/14/22 5:00:53
Isophorone	ND	71.9	23.5		µg/Kg-dry	1	12/14/22 5:00:53
2-Nitrophenol	ND	53.9	23.0		µg/Kg-dry	1	12/14/22 5:00:53
2,4-Dimethylphenol	ND	53.9	10.5		µg/Kg-dry	1	12/14/22 5:00:53
Bis(2-chloroethoxy)methane	ND	53.9	10.2		µg/Kg-dry	1	12/14/22 5:00:53
2,4-Dichlorophenol	ND	53.9	7.92		µg/Kg-dry	1	12/14/22 5:00:53
1,2,4-Trichlorobenzene	ND	53.9	20.2		µg/Kg-dry	1	12/14/22 5:00:53
Naphthalene	ND	71.9	22.0		µg/Kg-dry	1	12/14/22 5:00:53
4-Chloroaniline	ND	53.9	16.0		µg/Kg-dry	1	12/14/22 5:00:53
Hexachlorobutadiene	ND	53.9	15.6		µg/Kg-dry	1	12/14/22 5:00:53
4-Chloro-3-methylphenol	ND	53.9	20.5	Q	µg/Kg-dry	1	12/14/22 5:00:53
2-Methylnaphthalene	ND	53.9	13.2		µg/Kg-dry	1	12/14/22 5:00:53
1-Methylnaphthalene	ND	53.9	9.22		µg/Kg-dry	1	12/14/22 5:00:53
Hexachlorocyclopentadiene	ND	180	39.9	Q	µg/Kg-dry	1	12/14/22 5:00:53
2,4,6-Trichlorophenol	ND	53.9	22.8		µg/Kg-dry	1	12/14/22 5:00:53
2,4,5-Trichlorophenol	ND	53.9	15.9		µg/Kg-dry	1	12/14/22 5:00:53
2-Chloronaphthalene	ND	53.9	11.4		µg/Kg-dry	1	12/14/22 5:00:53
2-Nitroaniline	ND	89.9	35.7		µg/Kg-dry	1	12/14/22 5:00:53
Acenaphthene	ND	53.9	12.6		µg/Kg-dry	1	12/14/22 5:00:53
Dimethylphthalate	ND	6,290	2,900		µg/Kg-dry	1	12/14/22 5:00:53

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 10:15:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD67-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	71.9	26.0		µg/Kg-dry	1	12/14/22 5:00:53
Acenaphthylene	ND	53.9	11.3		µg/Kg-dry	1	12/14/22 5:00:53
2,4-Dinitrophenol	ND	539	232	Q	µg/Kg-dry	1	12/14/22 5:00:53
Dibenzofuran	ND	53.9	10.8		µg/Kg-dry	1	12/14/22 5:00:53
2,4-Dinitrotoluene	ND	108	43.6		µg/Kg-dry	1	12/14/22 5:00:53
4-Nitrophenol	ND	360	97.0	Q	µg/Kg-dry	1	12/14/22 5:00:53
Fluorene	ND	53.9	8.99		µg/Kg-dry	1	12/14/22 5:00:53
4-Chlorophenyl phenyl ether	ND	53.9	14.6		µg/Kg-dry	1	12/14/22 5:00:53
Diethylphthalate	ND	1,350	432		µg/Kg-dry	1	12/14/22 5:00:53
4,6-Dinitro-2-methylphenol	ND	449	197		µg/Kg-dry	1	12/14/22 5:00:53
4-Bromophenyl phenyl ether	ND	53.9	21.2		µg/Kg-dry	1	12/14/22 5:00:53
Hexachlorobenzene	ND	53.9	10.5		µg/Kg-dry	1	12/14/22 5:00:53
Pentachlorophenol	ND	360	129	Q	µg/Kg-dry	1	12/14/22 5:00:53
Phenanthrene	46.8	53.9	14.2	J	µg/Kg-dry	1	12/14/22 5:00:53
Anthracene	ND	53.9	9.96		µg/Kg-dry	1	12/14/22 5:00:53
Carbazole	ND	53.9	11.6		µg/Kg-dry	1	12/14/22 5:00:53
Di-n-butylphthalate	ND	53.9	19.4		µg/Kg-dry	1	12/14/22 5:00:53
Fluoranthene	81.4	53.9	15.9		µg/Kg-dry	1	12/14/22 5:00:53
Pyrene	ND	270	86.0		µg/Kg-dry	1	12/14/22 5:00:53
Butyl Benzylphthalate	ND	89.9	26.5		µg/Kg-dry	1	12/14/22 5:00:53
bis(2-Ethylhexyl)adipate	ND	360	132		µg/Kg-dry	1	12/14/22 5:00:53
Benz(a)anthracene	28.4	53.9	14.6	J	µg/Kg-dry	1	12/14/22 5:00:53
Chrysene	42.1	89.9	20.7	J	µg/Kg-dry	1	12/14/22 5:00:53
bis (2-Ethylhexyl) phthalate	ND	71.9	20.2	Q	µg/Kg-dry	1	12/14/22 5:00:53
Di-n-octyl phthalate	ND	135	33.6		µg/Kg-dry	1	12/14/22 5:00:53
Benzo(b)fluoranthene	31.4	180	19.0	J	µg/Kg-dry	1	12/14/22 5:00:53
Benzo(k)fluoranthene	ND	53.9	18.0		µg/Kg-dry	1	12/14/22 5:00:53
Benzo(a)pyrene	ND	71.9	26.1		µg/Kg-dry	1	12/14/22 5:00:53
Indeno(1,2,3-cd)pyrene	ND	360	124	Q	µg/Kg-dry	1	12/14/22 5:00:53
Dibenz(a,h)anthracene	ND	180	69.9		µg/Kg-dry	1	12/14/22 5:00:53
Benzo(g,h,i)perylene	ND	180	52.0	Q*	µg/Kg-dry	1	12/14/22 5:00:53

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 10:15:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD67-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Surr: 2,4,6-Tribromophenol	65.9	16.2 - 150	0		%Rec	1	12/14/22 5:00:53
Surr: 2-Fluorobiphenyl	69.6	25.3 - 139	0		%Rec	1	12/14/22 5:00:53
Surr: Nitrobenzene-d5	62.3	12.7 - 143	0		%Rec	1	12/14/22 5:00:53
Surr: Phenol-d6	58.4	21.4 - 139	0		%Rec	1	12/14/22 5:00:53
Surr: p-Terphenyl	69.2	37.1 - 144	0		%Rec	1	12/14/22 5:00:53

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	5.70	0.468	0.137		mg/Kg-dry	1	12/02/22 16:30:36
Cadmium	0.375	0.312	0.0119		mg/Kg-dry	1	12/02/22 16:30:36
Chromium	24.9	0.858	0.204		mg/Kg-dry	1	12/02/22 16:30:36
Copper	30.9	1.72	0.292		mg/Kg-dry	1	12/02/22 16:30:36
Lead	10.3	0.468	0.0649		mg/Kg-dry	1	12/02/22 16:30:36
Silver	0.111	0.156	0.0321	J	mg/Kg-dry	1	12/02/22 16:30:36
Zinc	56.6	2.73	0.951		mg/Kg-dry	1	12/02/22 16:30:36

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	52.5	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38800

Analyst: AT

Total Organic Carbon	2.52	0.150	0.0412		%-dry	1	12/12/22 15:19:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 10:45:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-004

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD66-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	68.6	18.1		µg/Kg-dry	1	12/14/22 5:30:38
Bis(2-chloroethyl) ether	ND	114	35.0		µg/Kg-dry	1	12/14/22 5:30:38
2-Chlorophenol	ND	91.5	33.0		µg/Kg-dry	1	12/14/22 5:30:38
1,3-Dichlorobenzene	ND	91.5	37.4		µg/Kg-dry	1	12/14/22 5:30:38
1,4-Dichlorobenzene	ND	68.6	29.5		µg/Kg-dry	1	12/14/22 5:30:38
1,2-Dichlorobenzene	ND	91.5	30.3		µg/Kg-dry	1	12/14/22 5:30:38
Benzyl alcohol	ND	343	132	Q	µg/Kg-dry	1	12/14/22 5:30:38
2-Methylphenol (o-cresol)	ND	91.5	35.6		µg/Kg-dry	1	12/14/22 5:30:38
Hexachloroethane	ND	91.5	28.8		µg/Kg-dry	1	12/14/22 5:30:38
N-Nitrosodi-n-propylamine	ND	183	62.8		µg/Kg-dry	1	12/14/22 5:30:38
3&4-Methylphenol (m, p-cresol)	ND	68.6	29.5		µg/Kg-dry	1	12/14/22 5:30:38
Nitrobenzene	ND	114	34.9		µg/Kg-dry	1	12/14/22 5:30:38
Isophorone	ND	91.5	29.9		µg/Kg-dry	1	12/14/22 5:30:38
2-Nitrophenol	ND	68.6	29.3		µg/Kg-dry	1	12/14/22 5:30:38
2,4-Dimethylphenol	ND	68.6	13.4		µg/Kg-dry	1	12/14/22 5:30:38
Bis(2-chloroethoxy)methane	ND	68.6	12.9		µg/Kg-dry	1	12/14/22 5:30:38
2,4-Dichlorophenol	ND	68.6	10.1		µg/Kg-dry	1	12/14/22 5:30:38
1,2,4-Trichlorobenzene	ND	68.6	25.7		µg/Kg-dry	1	12/14/22 5:30:38
Naphthalene	ND	91.5	27.9		µg/Kg-dry	1	12/14/22 5:30:38
4-Chloroaniline	ND	68.6	20.4		µg/Kg-dry	1	12/14/22 5:30:38
Hexachlorobutadiene	ND	68.6	19.9		µg/Kg-dry	1	12/14/22 5:30:38
4-Chloro-3-methylphenol	ND	68.6	26.1	Q	µg/Kg-dry	1	12/14/22 5:30:38
2-Methylnaphthalene	ND	68.6	16.8		µg/Kg-dry	1	12/14/22 5:30:38
1-Methylnaphthalene	ND	68.6	11.7		µg/Kg-dry	1	12/14/22 5:30:38
Hexachlorocyclopentadiene	ND	229	50.7	Q	µg/Kg-dry	1	12/14/22 5:30:38
2,4,6-Trichlorophenol	ND	68.6	28.9		µg/Kg-dry	1	12/14/22 5:30:38
2,4,5-Trichlorophenol	ND	68.6	20.2		µg/Kg-dry	1	12/14/22 5:30:38
2-Chloronaphthalene	ND	68.6	14.5		µg/Kg-dry	1	12/14/22 5:30:38
2-Nitroaniline	ND	114	45.4		µg/Kg-dry	1	12/14/22 5:30:38
Acenaphthene	ND	68.6	16.0		µg/Kg-dry	1	12/14/22 5:30:38
Dimethylphthalate	ND	8,000	3,690		µg/Kg-dry	1	12/14/22 5:30:38

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 10:45:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-004

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD66-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	91.5	33.1		µg/Kg-dry	1	12/14/22 5:30:38
Acenaphthylene	ND	68.6	14.3		µg/Kg-dry	1	12/14/22 5:30:38
2,4-Dinitrophenol	ND	686	295	Q	µg/Kg-dry	1	12/14/22 5:30:38
Dibenzofuran	ND	68.6	13.7		µg/Kg-dry	1	12/14/22 5:30:38
2,4-Dinitrotoluene	ND	137	55.4		µg/Kg-dry	1	12/14/22 5:30:38
4-Nitrophenol	ND	457	123	Q	µg/Kg-dry	1	12/14/22 5:30:38
Fluorene	ND	68.6	11.4		µg/Kg-dry	1	12/14/22 5:30:38
4-Chlorophenyl phenyl ether	ND	68.6	18.5		µg/Kg-dry	1	12/14/22 5:30:38
Diethylphthalate	ND	1,710	550		µg/Kg-dry	1	12/14/22 5:30:38
4,6-Dinitro-2-methylphenol	ND	572	251		µg/Kg-dry	1	12/14/22 5:30:38
4-Bromophenyl phenyl ether	ND	68.6	26.9		µg/Kg-dry	1	12/14/22 5:30:38
Hexachlorobenzene	ND	68.6	13.4		µg/Kg-dry	1	12/14/22 5:30:38
Pentachlorophenol	ND	457	164	Q	µg/Kg-dry	1	12/14/22 5:30:38
Phenanthrene	25.5	68.6	18.1	J	µg/Kg-dry	1	12/14/22 5:30:38
Anthracene	ND	68.6	12.7		µg/Kg-dry	1	12/14/22 5:30:38
Carbazole	ND	68.6	14.8		µg/Kg-dry	1	12/14/22 5:30:38
Di-n-butylphthalate	ND	68.6	24.7		µg/Kg-dry	1	12/14/22 5:30:38
Fluoranthene	54.8	68.6	20.2	J	µg/Kg-dry	1	12/14/22 5:30:38
Pyrene	ND	343	109		µg/Kg-dry	1	12/14/22 5:30:38
Butyl Benzylphthalate	ND	114	33.7		µg/Kg-dry	1	12/14/22 5:30:38
bis(2-Ethylhexyl)adipate	ND	457	168		µg/Kg-dry	1	12/14/22 5:30:38
Benz(a)anthracene	32.6	68.6	18.5	J	µg/Kg-dry	1	12/14/22 5:30:38
Chrysene	52.9	114	26.3	J	µg/Kg-dry	1	12/14/22 5:30:38
bis (2-Ethylhexyl) phthalate	ND	91.5	25.7	Q	µg/Kg-dry	1	12/14/22 5:30:38
Di-n-octyl phthalate	ND	171	42.7		µg/Kg-dry	1	12/14/22 5:30:38
Benzo(b)fluoranthene	47.5	229	24.2	J	µg/Kg-dry	1	12/14/22 5:30:38
Benzo(k)fluoranthene	28.2	68.6	22.9	J	µg/Kg-dry	1	12/14/22 5:30:38
Benzo(a)pyrene	ND	91.5	33.2		µg/Kg-dry	1	12/14/22 5:30:38
Indeno(1,2,3-cd)pyrene	ND	457	158	Q	µg/Kg-dry	1	12/14/22 5:30:38
Dibenz(a,h)anthracene	ND	229	88.9		µg/Kg-dry	1	12/14/22 5:30:38
Benzo(g,h,i)perylene	ND	229	66.1	Q*	µg/Kg-dry	1	12/14/22 5:30:38

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 10:45:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-004

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD66-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Surr: 2,4,6-Tribromophenol	71.2	16.2 - 150	0		%Rec	1	12/14/22 5:30:38
Surr: 2-Fluorobiphenyl	71.2	25.3 - 139	0		%Rec	1	12/14/22 5:30:38
Surr: Nitrobenzene-d5	65.8	12.7 - 143	0		%Rec	1	12/14/22 5:30:38
Surr: Phenol-d6	61.0	21.4 - 139	0		%Rec	1	12/14/22 5:30:38
Surr: p-Terphenyl	72.9	37.1 - 144	0		%Rec	1	12/14/22 5:30:38

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	8.11	0.555	0.162		mg/Kg-dry	1	12/02/22 16:33:19
Cadmium	0.827	0.370	0.0141		mg/Kg-dry	1	12/02/22 16:33:19
Chromium	32.2	1.02	0.242		mg/Kg-dry	1	12/02/22 16:33:19
Copper	45.4	2.03	0.346		mg/Kg-dry	1	12/02/22 16:33:19
Lead	11.0	0.555	0.0769		mg/Kg-dry	1	12/02/22 16:33:19
Silver	0.179	0.185	0.0381	J	mg/Kg-dry	1	12/02/22 16:33:19
Zinc	77.8	3.23	1.13		mg/Kg-dry	1	12/02/22 16:33:19

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	58.1	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38818

Analyst: AT

Total Organic Carbon	2.42	0.150	0.0412		%-dry	1	12/13/22 13:41:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 11:05:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-005

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD65-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	75.0	19.8		µg/Kg-dry	1	12/14/22 6:00:23
Bis(2-chloroethyl) ether	ND	125	38.3		µg/Kg-dry	1	12/14/22 6:00:23
2-Chlorophenol	ND	100	36.1		µg/Kg-dry	1	12/14/22 6:00:23
1,3-Dichlorobenzene	ND	100	41.0		µg/Kg-dry	1	12/14/22 6:00:23
1,4-Dichlorobenzene	ND	75.0	32.3		µg/Kg-dry	1	12/14/22 6:00:23
1,2-Dichlorobenzene	ND	100	33.1		µg/Kg-dry	1	12/14/22 6:00:23
Benzyl alcohol	ND	375	144	Q	µg/Kg-dry	1	12/14/22 6:00:23
2-Methylphenol (o-cresol)	ND	100	39.0		µg/Kg-dry	1	12/14/22 6:00:23
Hexachloroethane	ND	100	31.5		µg/Kg-dry	1	12/14/22 6:00:23
N-Nitrosodi-n-propylamine	ND	200	68.7		µg/Kg-dry	1	12/14/22 6:00:23
3&4-Methylphenol (m, p-cresol)	ND	75.0	32.3		µg/Kg-dry	1	12/14/22 6:00:23
Nitrobenzene	ND	125	38.2		µg/Kg-dry	1	12/14/22 6:00:23
Isophorone	ND	100	32.7		µg/Kg-dry	1	12/14/22 6:00:23
2-Nitrophenol	ND	75.0	32.1		µg/Kg-dry	1	12/14/22 6:00:23
2,4-Dimethylphenol	ND	75.0	14.6		µg/Kg-dry	1	12/14/22 6:00:23
Bis(2-chloroethoxy)methane	ND	75.0	14.2		µg/Kg-dry	1	12/14/22 6:00:23
2,4-Dichlorophenol	ND	75.0	11.0		µg/Kg-dry	1	12/14/22 6:00:23
1,2,4-Trichlorobenzene	ND	75.0	28.1		µg/Kg-dry	1	12/14/22 6:00:23
Naphthalene	ND	100	30.6		µg/Kg-dry	1	12/14/22 6:00:23
4-Chloroaniline	ND	75.0	22.3		µg/Kg-dry	1	12/14/22 6:00:23
Hexachlorobutadiene	ND	75.0	21.8		µg/Kg-dry	1	12/14/22 6:00:23
4-Chloro-3-methylphenol	ND	75.0	28.5	Q	µg/Kg-dry	1	12/14/22 6:00:23
2-Methylnaphthalene	ND	75.0	18.4		µg/Kg-dry	1	12/14/22 6:00:23
1-Methylnaphthalene	ND	75.0	12.8		µg/Kg-dry	1	12/14/22 6:00:23
Hexachlorocyclopentadiene	ND	250	55.5	Q	µg/Kg-dry	1	12/14/22 6:00:23
2,4,6-Trichlorophenol	ND	75.0	31.7		µg/Kg-dry	1	12/14/22 6:00:23
2,4,5-Trichlorophenol	ND	75.0	22.1		µg/Kg-dry	1	12/14/22 6:00:23
2-Chloronaphthalene	ND	75.0	15.9		µg/Kg-dry	1	12/14/22 6:00:23
2-Nitroaniline	ND	125	49.7		µg/Kg-dry	1	12/14/22 6:00:23
Acenaphthene	ND	75.0	17.5		µg/Kg-dry	1	12/14/22 6:00:23
Dimethylphthalate	ND	8,760	4,040		µg/Kg-dry	1	12/14/22 6:00:23

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 11:05:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-005

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD65-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	100	36.2		µg/Kg-dry	1	12/14/22 6:00:23
Acenaphthylene	ND	75.0	15.7		µg/Kg-dry	1	12/14/22 6:00:23
2,4-Dinitrophenol	ND	750	323	Q	µg/Kg-dry	1	12/14/22 6:00:23
Dibenzofuran	ND	75.0	15.0		µg/Kg-dry	1	12/14/22 6:00:23
2,4-Dinitrotoluene	ND	150	60.6		µg/Kg-dry	1	12/14/22 6:00:23
4-Nitrophenol	ND	500	135	Q	µg/Kg-dry	1	12/14/22 6:00:23
Fluorene	ND	75.0	12.5		µg/Kg-dry	1	12/14/22 6:00:23
4-Chlorophenyl phenyl ether	ND	75.0	20.3		µg/Kg-dry	1	12/14/22 6:00:23
Diethylphthalate	ND	1,880	601		µg/Kg-dry	1	12/14/22 6:00:23
4,6-Dinitro-2-methylphenol	ND	625	274		µg/Kg-dry	1	12/14/22 6:00:23
4-Bromophenyl phenyl ether	ND	75.0	29.5		µg/Kg-dry	1	12/14/22 6:00:23
Hexachlorobenzene	ND	75.0	14.6		µg/Kg-dry	1	12/14/22 6:00:23
Pentachlorophenol	ND	500	179	Q	µg/Kg-dry	1	12/14/22 6:00:23
Phenanthrene	ND	75.0	19.8		µg/Kg-dry	1	12/14/22 6:00:23
Anthracene	ND	75.0	13.9		µg/Kg-dry	1	12/14/22 6:00:23
Carbazole	ND	75.0	16.2		µg/Kg-dry	1	12/14/22 6:00:23
Di-n-butylphthalate	ND	75.0	27.0		µg/Kg-dry	1	12/14/22 6:00:23
Fluoranthene	36.9	75.0	22.1	J	µg/Kg-dry	1	12/14/22 6:00:23
Pyrene	ND	375	120		µg/Kg-dry	1	12/14/22 6:00:23
Butyl Benzylphthalate	ND	125	36.8		µg/Kg-dry	1	12/14/22 6:00:23
bis(2-Ethylhexyl)adipate	ND	500	184		µg/Kg-dry	1	12/14/22 6:00:23
Benz(a)anthracene	22.6	75.0	20.3	J	µg/Kg-dry	1	12/14/22 6:00:23
Chrysene	29.7	125	28.8	J	µg/Kg-dry	1	12/14/22 6:00:23
bis (2-Ethylhexyl) phthalate	ND	100	28.1	Q	µg/Kg-dry	1	12/14/22 6:00:23
Di-n-octyl phthalate	ND	188	46.7		µg/Kg-dry	1	12/14/22 6:00:23
Benzo(b)fluoranthene	ND	250	26.5		µg/Kg-dry	1	12/14/22 6:00:23
Benzo(k)fluoranthene	ND	75.0	25.1		µg/Kg-dry	1	12/14/22 6:00:23
Benzo(a)pyrene	ND	100	36.4		µg/Kg-dry	1	12/14/22 6:00:23
Indeno(1,2,3-cd)pyrene	ND	500	173	Q	µg/Kg-dry	1	12/14/22 6:00:23
Dibenz(a,h)anthracene	ND	250	97.3		µg/Kg-dry	1	12/14/22 6:00:23
Benzo(g,h,i)perylene	ND	250	72.4	Q*	µg/Kg-dry	1	12/14/22 6:00:23

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 11:05:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-005

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD65-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Surr: 2,4,6-Tribromophenol	64.9	16.2 - 150	0		%Rec	1	12/14/22 6:00:23
Surr: 2-Fluorobiphenyl	66.8	25.3 - 139	0		%Rec	1	12/14/22 6:00:23
Surr: Nitrobenzene-d5	58.9	12.7 - 143	0		%Rec	1	12/14/22 6:00:23
Surr: Phenol-d6	56.1	21.4 - 139	0		%Rec	1	12/14/22 6:00:23
Surr: p-Terphenyl	65.9	37.1 - 144	0		%Rec	1	12/14/22 6:00:23

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	6.76	0.568	0.166		mg/Kg-dry	1	12/02/22 16:36:03
Cadmium	0.575	0.378	0.0144		mg/Kg-dry	1	12/02/22 16:36:03
Chromium	33.7	1.04	0.247		mg/Kg-dry	1	12/02/22 16:36:03
Copper	50.7	2.08	0.354		mg/Kg-dry	1	12/02/22 16:36:03
Lead	12.2	0.568	0.0787		mg/Kg-dry	1	12/02/22 16:36:03
Silver	0.138	0.189	0.0390	J	mg/Kg-dry	1	12/02/22 16:36:03
Zinc	81.0	3.31	1.15		mg/Kg-dry	1	12/02/22 16:36:03

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	60.8	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38818

Analyst: AT

Total Organic Carbon	2.52	0.150	0.0412		%-dry	1	12/13/22 14:03:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 11:45:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-006

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD60-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Phenol	ND	46.0	12.1		µg/Kg-dry	1	12/14/22 6:30:09
Bis(2-chloroethyl) ether	ND	76.7	23.5		µg/Kg-dry	1	12/14/22 6:30:09
2-Chlorophenol	ND	61.4	22.2		µg/Kg-dry	1	12/14/22 6:30:09
1,3-Dichlorobenzene	ND	61.4	25.1		µg/Kg-dry	1	12/14/22 6:30:09
1,4-Dichlorobenzene	ND	46.0	19.8		µg/Kg-dry	1	12/14/22 6:30:09
1,2-Dichlorobenzene	ND	61.4	20.3		µg/Kg-dry	1	12/14/22 6:30:09
Benzyl alcohol	ND	230	88.3	Q	µg/Kg-dry	1	12/14/22 6:30:09
2-Methylphenol (o-cresol)	ND	61.4	23.9		µg/Kg-dry	1	12/14/22 6:30:09
Hexachloroethane	ND	61.4	19.3		µg/Kg-dry	1	12/14/22 6:30:09
N-Nitrosodi-n-propylamine	ND	123	42.2		µg/Kg-dry	1	12/14/22 6:30:09
3&4-Methylphenol (m, p-cresol)	ND	46.0	19.8		µg/Kg-dry	1	12/14/22 6:30:09
Nitrobenzene	ND	76.7	23.5		µg/Kg-dry	1	12/14/22 6:30:09
Isophorone	ND	61.4	20.0		µg/Kg-dry	1	12/14/22 6:30:09
2-Nitrophenol	ND	46.0	19.7		µg/Kg-dry	1	12/14/22 6:30:09
2,4-Dimethylphenol	ND	46.0	8.99		µg/Kg-dry	1	12/14/22 6:30:09
Bis(2-chloroethoxy)methane	ND	46.0	8.69		µg/Kg-dry	1	12/14/22 6:30:09
2,4-Dichlorophenol	ND	46.0	6.77		µg/Kg-dry	1	12/14/22 6:30:09
1,2,4-Trichlorobenzene	ND	46.0	17.2		µg/Kg-dry	1	12/14/22 6:30:09
Naphthalene	ND	61.4	18.8		µg/Kg-dry	1	12/14/22 6:30:09
4-Chloroaniline	ND	46.0	13.7		µg/Kg-dry	1	12/14/22 6:30:09
Hexachlorobutadiene	ND	46.0	13.4		µg/Kg-dry	1	12/14/22 6:30:09
4-Chloro-3-methylphenol	ND	46.0	17.5	Q	µg/Kg-dry	1	12/14/22 6:30:09
2-Methylnaphthalene	ND	46.0	11.3		µg/Kg-dry	1	12/14/22 6:30:09
1-Methylnaphthalene	ND	46.0	7.88		µg/Kg-dry	1	12/14/22 6:30:09
Hexachlorocyclopentadiene	ND	153	34.0	Q	µg/Kg-dry	1	12/14/22 6:30:09
2,4,6-Trichlorophenol	ND	46.0	19.4		µg/Kg-dry	1	12/14/22 6:30:09
2,4,5-Trichlorophenol	ND	46.0	13.6		µg/Kg-dry	1	12/14/22 6:30:09
2-Chloronaphthalene	ND	46.0	9.74		µg/Kg-dry	1	12/14/22 6:30:09
2-Nitroaniline	ND	76.7	30.5		µg/Kg-dry	1	12/14/22 6:30:09
Acenaphthene	ND	46.0	10.7		µg/Kg-dry	1	12/14/22 6:30:09
Dimethylphthalate	ND	5,370	2,480		µg/Kg-dry	1	12/14/22 6:30:09

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 11:45:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-006

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD60-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	61.4	22.2		µg/Kg-dry	1	12/14/22 6:30:09
Acenaphthylene	ND	46.0	9.62		µg/Kg-dry	1	12/14/22 6:30:09
2,4-Dinitrophenol	ND	460	198	Q	µg/Kg-dry	1	12/14/22 6:30:09
Dibenzofuran	ND	46.0	9.18		µg/Kg-dry	1	12/14/22 6:30:09
2,4-Dinitrotoluene	ND	92.1	37.2		µg/Kg-dry	1	12/14/22 6:30:09
4-Nitrophenol	ND	307	82.8	Q	µg/Kg-dry	1	12/14/22 6:30:09
Fluorene	ND	46.0	7.67		µg/Kg-dry	1	12/14/22 6:30:09
4-Chlorophenyl phenyl ether	ND	46.0	12.5		µg/Kg-dry	1	12/14/22 6:30:09
Diethylphthalate	ND	1,150	369		µg/Kg-dry	1	12/14/22 6:30:09
4,6-Dinitro-2-methylphenol	ND	384	168		µg/Kg-dry	1	12/14/22 6:30:09
4-Bromophenyl phenyl ether	ND	46.0	18.1		µg/Kg-dry	1	12/14/22 6:30:09
Hexachlorobenzene	ND	46.0	8.98		µg/Kg-dry	1	12/14/22 6:30:09
Pentachlorophenol	ND	307	110	Q	µg/Kg-dry	1	12/14/22 6:30:09
Phenanthrene	ND	46.0	12.1		µg/Kg-dry	1	12/14/22 6:30:09
Anthracene	ND	46.0	8.51		µg/Kg-dry	1	12/14/22 6:30:09
Carbazole	ND	46.0	9.92		µg/Kg-dry	1	12/14/22 6:30:09
Di-n-butylphthalate	ND	46.0	16.6		µg/Kg-dry	1	12/14/22 6:30:09
Fluoranthene	15.5	46.0	13.5	J	µg/Kg-dry	1	12/14/22 6:30:09
Pyrene	ND	230	73.4		µg/Kg-dry	1	12/14/22 6:30:09
Butyl Benzylphthalate	ND	76.7	22.6		µg/Kg-dry	1	12/14/22 6:30:09
bis(2-Ethylhexyl)adipate	ND	307	113		µg/Kg-dry	1	12/14/22 6:30:09
Benz(a)anthracene	17.2	46.0	12.4	J	µg/Kg-dry	1	12/14/22 6:30:09
Chrysene	20.4	76.7	17.6	J	µg/Kg-dry	1	12/14/22 6:30:09
bis (2-Ethylhexyl) phthalate	ND	61.4	17.3	Q	µg/Kg-dry	1	12/14/22 6:30:09
Di-n-octyl phthalate	ND	115	28.7		µg/Kg-dry	1	12/14/22 6:30:09
Benzo(b)fluoranthene	23.0	153	16.2	J	µg/Kg-dry	1	12/14/22 6:30:09
Benzo(k)fluoranthene	ND	46.0	15.4		µg/Kg-dry	1	12/14/22 6:30:09
Benzo(a)pyrene	ND	61.4	22.3		µg/Kg-dry	1	12/14/22 6:30:09
Indeno(1,2,3-cd)pyrene	ND	307	106	Q	µg/Kg-dry	1	12/14/22 6:30:09
Dibenz(a,h)anthracene	ND	153	59.7		µg/Kg-dry	1	12/14/22 6:30:09
Benzo(g,h,i)perylene	ND	153	44.4	Q*	µg/Kg-dry	1	12/14/22 6:30:09

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 11:45:00 AM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-006

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD60-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Surr: 2,4,6-Tribromophenol	70.4	16.2 - 150	0		%Rec	1	12/14/22 6:30:09
Surr: 2-Fluorobiphenyl	74.4	25.3 - 139	0		%Rec	1	12/14/22 6:30:09
Surr: Nitrobenzene-d5	67.7	12.7 - 143	0		%Rec	1	12/14/22 6:30:09
Surr: Phenol-d6	64.5	21.4 - 139	0		%Rec	1	12/14/22 6:30:09
Surr: p-Terphenyl	73.7	37.1 - 144	0		%Rec	1	12/14/22 6:30:09

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	4.33	0.402	0.117		mg/Kg-dry	1	12/02/22 16:38:46
Cadmium	0.377	0.268	0.0102		mg/Kg-dry	1	12/02/22 16:38:46
Chromium	22.8	0.736	0.175		mg/Kg-dry	1	12/02/22 16:38:46
Copper	25.0	1.47	0.251		mg/Kg-dry	1	12/02/22 16:38:46
Lead	12.0	0.402	0.0557		mg/Kg-dry	1	12/02/22 16:38:46
Silver	0.0953	0.134	0.0276	J	mg/Kg-dry	1	12/02/22 16:38:46
Zinc	54.3	2.34	0.816		mg/Kg-dry	1	12/02/22 16:38:46

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	40.2	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38818

Analyst: AT

Total Organic Carbon	1.22	0.150	0.0412		%-dry	1	12/13/22 14:23:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 12:10:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-007

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD60-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38692		Analyst: SK		
Phenol	ND	44.8	11.8		µg/Kg-dry	1	12/14/22 1:02:05
Bis(2-chloroethyl) ether	ND	74.7	22.9		µg/Kg-dry	1	12/14/22 1:02:05
2-Chlorophenol	ND	59.8	21.6		µg/Kg-dry	1	12/14/22 1:02:05
1,3-Dichlorobenzene	ND	59.8	24.5		µg/Kg-dry	1	12/14/22 1:02:05
1,4-Dichlorobenzene	ND	44.8	19.3		µg/Kg-dry	1	12/14/22 1:02:05
1,2-Dichlorobenzene	ND	59.8	19.8		µg/Kg-dry	1	12/14/22 1:02:05
Benzyl alcohol	ND	224	86.0	Q	µg/Kg-dry	1	12/14/22 1:02:05
2-Methylphenol (o-cresol)	ND	59.8	23.3	Q	µg/Kg-dry	1	12/14/22 1:02:05
Hexachloroethane	ND	59.8	18.8		µg/Kg-dry	1	12/14/22 1:02:05
N-Nitrosodi-n-propylamine	ND	120	41.0		µg/Kg-dry	1	12/14/22 1:02:05
3&4-Methylphenol (m, p-cresol)	ND	44.8	19.3		µg/Kg-dry	1	12/14/22 1:02:05
Nitrobenzene	ND	74.7	22.8		µg/Kg-dry	1	12/14/22 1:02:05
Isophorone	ND	59.8	19.5		µg/Kg-dry	1	12/14/22 1:02:05
2-Nitrophenol	ND	44.8	19.2		µg/Kg-dry	1	12/14/22 1:02:05
2,4-Dimethylphenol	ND	44.8	8.75		µg/Kg-dry	1	12/14/22 1:02:05
Bis(2-chloroethoxy)methane	ND	44.8	8.46		µg/Kg-dry	1	12/14/22 1:02:05
2,4-Dichlorophenol	ND	44.8	6.59		µg/Kg-dry	1	12/14/22 1:02:05
1,2,4-Trichlorobenzene	ND	44.8	16.8		µg/Kg-dry	1	12/14/22 1:02:05
Naphthalene	ND	59.8	18.3		µg/Kg-dry	1	12/14/22 1:02:05
4-Chloroaniline	ND	44.8	13.3		µg/Kg-dry	1	12/14/22 1:02:05
Hexachlorobutadiene	ND	44.8	13.0		µg/Kg-dry	1	12/14/22 1:02:05
4-Chloro-3-methylphenol	ND	44.8	17.0	Q	µg/Kg-dry	1	12/14/22 1:02:05
2-Methylnaphthalene	ND	44.8	11.0		µg/Kg-dry	1	12/14/22 1:02:05
1-Methylnaphthalene	ND	44.8	7.67		µg/Kg-dry	1	12/14/22 1:02:05
Hexachlorocyclopentadiene	ND	149	33.1		µg/Kg-dry	1	12/14/22 1:02:05
2,4,6-Trichlorophenol	ND	44.8	18.9		µg/Kg-dry	1	12/14/22 1:02:05
2,4,5-Trichlorophenol	ND	44.8	13.2		µg/Kg-dry	1	12/14/22 1:02:05
2-Chloronaphthalene	ND	44.8	9.48		µg/Kg-dry	1	12/14/22 1:02:05
2-Nitroaniline	ND	74.7	29.7		µg/Kg-dry	1	12/14/22 1:02:05
Acenaphthene	ND	44.8	10.4		µg/Kg-dry	1	12/14/22 1:02:05
Dimethylphthalate	ND	5,230	2,410		µg/Kg-dry	1	12/14/22 1:02:05

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 12:10:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-007

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD60-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38692		Analyst: SK		
2,6-Dinitrotoluene	ND	59.8	21.6		µg/Kg-dry	1	12/14/22 1:02:05
Acenaphthylene	ND	44.8	9.36		µg/Kg-dry	1	12/14/22 1:02:05
2,4-Dinitrophenol	ND	448	193		µg/Kg-dry	1	12/14/22 1:02:05
Dibenzofuran	ND	44.8	8.93		µg/Kg-dry	1	12/14/22 1:02:05
2,4-Dinitrotoluene	ND	89.6	36.2		µg/Kg-dry	1	12/14/22 1:02:05
4-Nitrophenol	ND	299	80.6	Q	µg/Kg-dry	1	12/14/22 1:02:05
Fluorene	ND	44.8	7.47		µg/Kg-dry	1	12/14/22 1:02:05
4-Chlorophenyl phenyl ether	ND	44.8	12.1		µg/Kg-dry	1	12/14/22 1:02:05
Diethylphthalate	ND	1,120	359		µg/Kg-dry	1	12/14/22 1:02:05
4,6-Dinitro-2-methylphenol	ND	373	164		µg/Kg-dry	1	12/14/22 1:02:05
4-Bromophenyl phenyl ether	ND	44.8	17.6		µg/Kg-dry	1	12/14/22 1:02:05
Hexachlorobenzene	ND	44.8	8.74		µg/Kg-dry	1	12/14/22 1:02:05
Pentachlorophenol	ND	299	107		µg/Kg-dry	1	12/14/22 1:02:05
Phenanthrene	18.5	44.8	11.8	J	µg/Kg-dry	1	12/14/22 1:02:05
Anthracene	ND	44.8	8.28		µg/Kg-dry	1	12/14/22 1:02:05
Carbazole	ND	44.8	9.65		µg/Kg-dry	1	12/14/22 1:02:05
Di-n-butylphthalate	ND	44.8	16.1		µg/Kg-dry	1	12/14/22 1:02:05
Fluoranthene	43.5	44.8	13.2	J	µg/Kg-dry	1	12/14/22 1:02:05
Pyrene	ND	224	71.5		µg/Kg-dry	1	12/14/22 1:02:05
Butyl Benzylphthalate	ND	74.7	22.0		µg/Kg-dry	1	12/14/22 1:02:05
bis(2-Ethylhexyl)adipate	ND	299	110		µg/Kg-dry	1	12/14/22 1:02:05
Benz(a)anthracene	25.0	44.8	12.1	J	µg/Kg-dry	1	12/14/22 1:02:05
Chrysene	30.4	74.7	17.2	J	µg/Kg-dry	1	12/14/22 1:02:05
bis (2-Ethylhexyl) phthalate	47.9	59.8	16.8	J	µg/Kg-dry	1	12/14/22 1:02:05
Di-n-octyl phthalate	ND	112	27.9		µg/Kg-dry	1	12/14/22 1:02:05
Benzo(b)fluoranthene	ND	149	15.8		µg/Kg-dry	1	12/14/22 1:02:05
Benzo(k)fluoranthene	ND	44.8	15.0		µg/Kg-dry	1	12/14/22 1:02:05
Benzo(a)pyrene	ND	59.8	21.7		µg/Kg-dry	1	12/14/22 1:02:05
Indeno(1,2,3-cd)pyrene	ND	299	103		µg/Kg-dry	1	12/14/22 1:02:05
Dibenz(a,h)anthracene	ND	149	58.1		µg/Kg-dry	1	12/14/22 1:02:05
Benzo(g,h,i)perylene	ND	149	43.2		µg/Kg-dry	1	12/14/22 1:02:05

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 12:10:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-007

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD60-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38692

Analyst: SK

Surr: 2,4,6-Tribromophenol	74.5	16.2 - 150	0		%Rec	1	12/14/22 1:02:05
Surr: 2-Fluorobiphenyl	77.2	25.3 - 139	0		%Rec	1	12/14/22 1:02:05
Surr: Nitrobenzene-d5	66.5	12.7 - 143	0		%Rec	1	12/14/22 1:02:05
Surr: Phenol-d6	60.8	21.4 - 139	0		%Rec	1	12/14/22 1:02:05
Surr: p-Terphenyl	75.7	37.1 - 144	0		%Rec	1	12/14/22 1:02:05

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	4.85	0.421	0.123		mg/Kg-dry	1	12/02/22 16:41:30
Cadmium	0.525	0.281	0.0107		mg/Kg-dry	1	12/02/22 16:41:30
Chromium	25.0	0.772	0.183		mg/Kg-dry	1	12/02/22 16:41:30
Copper	31.5	1.54	0.263		mg/Kg-dry	1	12/02/22 16:41:30
Lead	13.6	0.421	0.0584		mg/Kg-dry	1	12/02/22 16:41:30
Silver	0.130	0.140	0.0289	J	mg/Kg-dry	1	12/02/22 16:41:30
Zinc	64.4	2.46	0.856		mg/Kg-dry	1	12/02/22 16:41:30

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	46.8	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38818

Analyst: AT

Total Organic Carbon	1.37	0.150	0.0412		%-dry	1	12/13/22 14:35:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 12:42:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-008

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD61-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38692		Analyst: SK		
Phenol	ND	40.1	10.6		µg/Kg-dry	1	12/14/22 1:32:02
Bis(2-chloroethyl) ether	ND	66.9	20.5		µg/Kg-dry	1	12/14/22 1:32:02
2-Chlorophenol	ND	53.5	19.3		µg/Kg-dry	1	12/14/22 1:32:02
1,3-Dichlorobenzene	ND	53.5	21.9		µg/Kg-dry	1	12/14/22 1:32:02
1,4-Dichlorobenzene	ND	40.1	17.3		µg/Kg-dry	1	12/14/22 1:32:02
1,2-Dichlorobenzene	ND	53.5	17.7		µg/Kg-dry	1	12/14/22 1:32:02
Benzyl alcohol	ND	201	77.0	Q	µg/Kg-dry	1	12/14/22 1:32:02
2-Methylphenol (o-cresol)	ND	53.5	20.9	Q	µg/Kg-dry	1	12/14/22 1:32:02
Hexachloroethane	ND	53.5	16.8		µg/Kg-dry	1	12/14/22 1:32:02
N-Nitrosodi-n-propylamine	ND	107	36.8		µg/Kg-dry	1	12/14/22 1:32:02
3&4-Methylphenol (m, p-cresol)	59.9	40.1	17.3		µg/Kg-dry	1	12/14/22 1:32:02
Nitrobenzene	ND	66.9	20.5		µg/Kg-dry	1	12/14/22 1:32:02
Isophorone	ND	53.5	17.5		µg/Kg-dry	1	12/14/22 1:32:02
2-Nitrophenol	ND	40.1	17.2		µg/Kg-dry	1	12/14/22 1:32:02
2,4-Dimethylphenol	ND	40.1	7.83		µg/Kg-dry	1	12/14/22 1:32:02
Bis(2-chloroethoxy)methane	ND	40.1	7.58		µg/Kg-dry	1	12/14/22 1:32:02
2,4-Dichlorophenol	ND	40.1	5.90		µg/Kg-dry	1	12/14/22 1:32:02
1,2,4-Trichlorobenzene	ND	40.1	15.0		µg/Kg-dry	1	12/14/22 1:32:02
Naphthalene	22.2	53.5	16.4	J	µg/Kg-dry	1	12/14/22 1:32:02
4-Chloroaniline	ND	40.1	11.9		µg/Kg-dry	1	12/14/22 1:32:02
Hexachlorobutadiene	ND	40.1	11.6		µg/Kg-dry	1	12/14/22 1:32:02
4-Chloro-3-methylphenol	ND	40.1	15.3	Q	µg/Kg-dry	1	12/14/22 1:32:02
2-Methylnaphthalene	ND	40.1	9.83		µg/Kg-dry	1	12/14/22 1:32:02
1-Methylnaphthalene	ND	40.1	6.87		µg/Kg-dry	1	12/14/22 1:32:02
Hexachlorocyclopentadiene	ND	134	29.7		µg/Kg-dry	1	12/14/22 1:32:02
2,4,6-Trichlorophenol	ND	40.1	16.9		µg/Kg-dry	1	12/14/22 1:32:02
2,4,5-Trichlorophenol	ND	40.1	11.8		µg/Kg-dry	1	12/14/22 1:32:02
2-Chloronaphthalene	ND	40.1	8.49		µg/Kg-dry	1	12/14/22 1:32:02
2-Nitroaniline	ND	66.9	26.6		µg/Kg-dry	1	12/14/22 1:32:02
Acenaphthene	ND	40.1	9.35		µg/Kg-dry	1	12/14/22 1:32:02
Dimethylphthalate	ND	4,680	2,160		µg/Kg-dry	1	12/14/22 1:32:02

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 12:42:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-008

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD61-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38692

Analyst: SK

2,6-Dinitrotoluene	ND	53.5	19.4		µg/Kg-dry	1	12/14/22 1:32:02
Acenaphthylene	ND	40.1	8.39		µg/Kg-dry	1	12/14/22 1:32:02
2,4-Dinitrophenol	ND	401	173		µg/Kg-dry	1	12/14/22 1:32:02
Dibenzofuran	ND	40.1	8.00		µg/Kg-dry	1	12/14/22 1:32:02
2,4-Dinitrotoluene	ND	80.3	32.4		µg/Kg-dry	1	12/14/22 1:32:02
4-Nitrophenol	ND	268	72.2	Q	µg/Kg-dry	1	12/14/22 1:32:02
Fluorene	ND	40.1	6.69		µg/Kg-dry	1	12/14/22 1:32:02
4-Chlorophenyl phenyl ether	ND	40.1	10.9		µg/Kg-dry	1	12/14/22 1:32:02
Diethylphthalate	ND	1,000	322		µg/Kg-dry	1	12/14/22 1:32:02
4,6-Dinitro-2-methylphenol	ND	334	147		µg/Kg-dry	1	12/14/22 1:32:02
4-Bromophenyl phenyl ether	ND	40.1	15.8		µg/Kg-dry	1	12/14/22 1:32:02
Hexachlorobenzene	ND	40.1	7.83		µg/Kg-dry	1	12/14/22 1:32:02
Pentachlorophenol	ND	268	95.9		µg/Kg-dry	1	12/14/22 1:32:02
Phenanthrene	31.8	40.1	10.6	J	µg/Kg-dry	1	12/14/22 1:32:02
Anthracene	ND	40.1	7.42		µg/Kg-dry	1	12/14/22 1:32:02
Carbazole	ND	40.1	8.64		µg/Kg-dry	1	12/14/22 1:32:02
Di-n-butylphthalate	ND	40.1	14.5		µg/Kg-dry	1	12/14/22 1:32:02
Fluoranthene	68.8	40.1	11.8		µg/Kg-dry	1	12/14/22 1:32:02
Pyrene	ND	201	64.0		µg/Kg-dry	1	12/14/22 1:32:02
Butyl Benzylphthalate	ND	66.9	19.7		µg/Kg-dry	1	12/14/22 1:32:02
bis(2-Ethylhexyl)adipate	ND	268	98.5		µg/Kg-dry	1	12/14/22 1:32:02
Benz(a)anthracene	26.0	40.1	10.8	J	µg/Kg-dry	1	12/14/22 1:32:02
Chrysene	33.5	66.9	15.4	J	µg/Kg-dry	1	12/14/22 1:32:02
bis (2-Ethylhexyl) phthalate	ND	53.5	15.1		µg/Kg-dry	1	12/14/22 1:32:02
Di-n-octyl phthalate	ND	100	25.0		µg/Kg-dry	1	12/14/22 1:32:02
Benzo(b)fluoranthene	28.6	134	14.2	J	µg/Kg-dry	1	12/14/22 1:32:02
Benzo(k)fluoranthene	13.4	40.1	13.4	J	µg/Kg-dry	1	12/14/22 1:32:02
Benzo(a)pyrene	27.9	53.5	19.4	J	µg/Kg-dry	1	12/14/22 1:32:02
Indeno(1,2,3-cd)pyrene	ND	268	92.5		µg/Kg-dry	1	12/14/22 1:32:02
Dibenz(a,h)anthracene	ND	134	52.1		µg/Kg-dry	1	12/14/22 1:32:02
Benzo(g,h,i)perylene	ND	134	38.7		µg/Kg-dry	1	12/14/22 1:32:02

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 12:42:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-008

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD61-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38692

Analyst: SK

Surr: 2,4,6-Tribromophenol	59.5	16.2 - 150	0		%Rec	1	12/14/22 1:32:02
Surr: 2-Fluorobiphenyl	58.4	25.3 - 139	0		%Rec	1	12/14/22 1:32:02
Surr: Nitrobenzene-d5	51.0	12.7 - 143	0		%Rec	1	12/14/22 1:32:02
Surr: Phenol-d6	46.3	21.4 - 139	0		%Rec	1	12/14/22 1:32:02
Surr: p-Terphenyl	57.7	37.1 - 144	0		%Rec	1	12/14/22 1:32:02

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	5.67	0.409	0.119		mg/Kg-dry	1	12/02/22 16:44:13
Cadmium	0.735	0.273	0.0104		mg/Kg-dry	1	12/02/22 16:44:13
Chromium	29.7	0.750	0.178		mg/Kg-dry	1	12/02/22 16:44:13
Copper	25.5	1.50	0.255		mg/Kg-dry	1	12/02/22 16:44:13
Lead	22.7	0.409	0.0568		mg/Kg-dry	1	12/02/22 16:44:13
Silver	0.193	0.136	0.0281		mg/Kg-dry	1	12/02/22 16:44:13
Zinc	55.9	2.39	0.832		mg/Kg-dry	1	12/02/22 16:44:13

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	44.5	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38818

Analyst: AT

Total Organic Carbon	1.58	0.150	0.0412		%-dry	1	12/13/22 14:55:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 1:10:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-009

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD61-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38692

Analyst: SK

Phenol	ND	48.1	12.7		µg/Kg-dry	1	12/14/22 2:01:49
Bis(2-chloroethyl) ether	ND	80.1	24.5		µg/Kg-dry	1	12/14/22 2:01:49
2-Chlorophenol	ND	64.1	23.1		µg/Kg-dry	1	12/14/22 2:01:49
1,3-Dichlorobenzene	ND	64.1	26.2		µg/Kg-dry	1	12/14/22 2:01:49
1,4-Dichlorobenzene	ND	48.1	20.7		µg/Kg-dry	1	12/14/22 2:01:49
1,2-Dichlorobenzene	ND	64.1	21.2		µg/Kg-dry	1	12/14/22 2:01:49
Benzyl alcohol	ND	240	92.2	Q	µg/Kg-dry	1	12/14/22 2:01:49
2-Methylphenol (o-cresol)	ND	64.1	25.0	Q	µg/Kg-dry	1	12/14/22 2:01:49
Hexachloroethane	ND	64.1	20.2		µg/Kg-dry	1	12/14/22 2:01:49
N-Nitrosodi-n-propylamine	ND	128	44.0		µg/Kg-dry	1	12/14/22 2:01:49
3&4-Methylphenol (m, p-cresol)	381	48.1	20.7		µg/Kg-dry	1	12/14/22 2:01:49
Nitrobenzene	ND	80.1	24.5		µg/Kg-dry	1	12/14/22 2:01:49
Isophorone	ND	64.1	20.9		µg/Kg-dry	1	12/14/22 2:01:49
2-Nitrophenol	ND	48.1	20.5		µg/Kg-dry	1	12/14/22 2:01:49
2,4-Dimethylphenol	ND	48.1	9.38		µg/Kg-dry	1	12/14/22 2:01:49
Bis(2-chloroethoxy)methane	ND	48.1	9.08		µg/Kg-dry	1	12/14/22 2:01:49
2,4-Dichlorophenol	ND	48.1	7.06		µg/Kg-dry	1	12/14/22 2:01:49
1,2,4-Trichlorobenzene	ND	48.1	18.0		µg/Kg-dry	1	12/14/22 2:01:49
Naphthalene	203	64.1	19.6		µg/Kg-dry	1	12/14/22 2:01:49
4-Chloroaniline	ND	48.1	14.3		µg/Kg-dry	1	12/14/22 2:01:49
Hexachlorobutadiene	ND	48.1	13.9		µg/Kg-dry	1	12/14/22 2:01:49
4-Chloro-3-methylphenol	ND	48.1	18.3	Q	µg/Kg-dry	1	12/14/22 2:01:49
2-Methylnaphthalene	18.6	48.1	11.8	J	µg/Kg-dry	1	12/14/22 2:01:49
1-Methylnaphthalene	11.7	48.1	8.22	J	µg/Kg-dry	1	12/14/22 2:01:49
Hexachlorocyclopentadiene	ND	160	35.5		µg/Kg-dry	1	12/14/22 2:01:49
2,4,6-Trichlorophenol	ND	48.1	20.3		µg/Kg-dry	1	12/14/22 2:01:49
2,4,5-Trichlorophenol	ND	48.1	14.2		µg/Kg-dry	1	12/14/22 2:01:49
2-Chloronaphthalene	ND	48.1	10.2		µg/Kg-dry	1	12/14/22 2:01:49
2-Nitroaniline	ND	80.1	31.8		µg/Kg-dry	1	12/14/22 2:01:49
Acenaphthene	13.1	48.1	11.2	J	µg/Kg-dry	1	12/14/22 2:01:49
Dimethylphthalate	ND	5,610	2,590		µg/Kg-dry	1	12/14/22 2:01:49

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 1:10:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-009

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD61-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38692

Analyst: SK

2,6-Dinitrotoluene	ND	64.1	23.2		µg/Kg-dry	1	12/14/22 2:01:49
Acenaphthylene	27.8	48.1	10.0	J	µg/Kg-dry	1	12/14/22 2:01:49
2,4-Dinitrophenol	ND	481	207		µg/Kg-dry	1	12/14/22 2:01:49
Dibenzofuran	15.2	48.1	9.58	J	µg/Kg-dry	1	12/14/22 2:01:49
2,4-Dinitrotoluene	ND	96.2	38.8		µg/Kg-dry	1	12/14/22 2:01:49
4-Nitrophenol	ND	321	86.5	Q	µg/Kg-dry	1	12/14/22 2:01:49
Fluorene	16.5	48.1	8.01	J	µg/Kg-dry	1	12/14/22 2:01:49
4-Chlorophenyl phenyl ether	ND	48.1	13.0		µg/Kg-dry	1	12/14/22 2:01:49
Diethylphthalate	ND	1,200	385		µg/Kg-dry	1	12/14/22 2:01:49
4,6-Dinitro-2-methylphenol	ND	401	176		µg/Kg-dry	1	12/14/22 2:01:49
4-Bromophenyl phenyl ether	ND	48.1	18.9		µg/Kg-dry	1	12/14/22 2:01:49
Hexachlorobenzene	ND	48.1	9.38		µg/Kg-dry	1	12/14/22 2:01:49
Pentachlorophenol	ND	321	115		µg/Kg-dry	1	12/14/22 2:01:49
Phenanthrene	102	48.1	12.7		µg/Kg-dry	1	12/14/22 2:01:49
Anthracene	ND	48.1	8.88		µg/Kg-dry	1	12/14/22 2:01:49
Carbazole	ND	48.1	10.4		µg/Kg-dry	1	12/14/22 2:01:49
Di-n-butylphthalate	ND	48.1	17.3		µg/Kg-dry	1	12/14/22 2:01:49
Fluoranthene	177	48.1	14.1		µg/Kg-dry	1	12/14/22 2:01:49
Pyrene	155	240	76.7	J	µg/Kg-dry	1	12/14/22 2:01:49
Butyl Benzylphthalate	ND	80.1	23.6		µg/Kg-dry	1	12/14/22 2:01:49
bis(2-Ethylhexyl)adipate	ND	321	118		µg/Kg-dry	1	12/14/22 2:01:49
Benz(a)anthracene	34.3	48.1	13.0	J	µg/Kg-dry	1	12/14/22 2:01:49
Chrysene	48.5	80.1	18.4	J	µg/Kg-dry	1	12/14/22 2:01:49
bis (2-Ethylhexyl) phthalate	24.7	64.1	18.0	J	µg/Kg-dry	1	12/14/22 2:01:49
Di-n-octyl phthalate	ND	120	29.9		µg/Kg-dry	1	12/14/22 2:01:49
Benzo(b)fluoranthene	36.6	160	17.0	J	µg/Kg-dry	1	12/14/22 2:01:49
Benzo(k)fluoranthene	19.4	48.1	16.1	J	µg/Kg-dry	1	12/14/22 2:01:49
Benzo(a)pyrene	ND	64.1	23.3		µg/Kg-dry	1	12/14/22 2:01:49
Indeno(1,2,3-cd)pyrene	ND	321	111		µg/Kg-dry	1	12/14/22 2:01:49
Dibenz(a,h)anthracene	ND	160	62.3		µg/Kg-dry	1	12/14/22 2:01:49
Benzo(g,h,i)perylene	ND	160	46.4		µg/Kg-dry	1	12/14/22 2:01:49

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-009  
**Client Sample ID:** WB-SO-SD61-0020

**Collection Date:** 11/28/2022 1:10:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38692 Analyst: SK

Surr: 2,4,6-Tribromophenol	58.7	16.2 - 150	0		%Rec	1	12/14/22 2:01:49
Surr: 2-Fluorobiphenyl	57.5	25.3 - 139	0		%Rec	1	12/14/22 2:01:49
Surr: Nitrobenzene-d5	51.1	12.7 - 143	0		%Rec	1	12/14/22 2:01:49
Surr: Phenol-d6	47.5	21.4 - 139	0		%Rec	1	12/14/22 2:01:49
Surr: p-Terphenyl	55.1	37.1 - 144	0		%Rec	1	12/14/22 2:01:49

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	6.06	0.465	0.136		mg/Kg-dry	1	12/02/22 16:46:56
Cadmium	0.697	0.310	0.0118		mg/Kg-dry	1	12/02/22 16:46:56
Chromium	28.3	0.853	0.203		mg/Kg-dry	1	12/02/22 16:46:56
Copper	30.0	1.71	0.290		mg/Kg-dry	1	12/02/22 16:46:56
Lead	10.9	0.465	0.0645		mg/Kg-dry	1	12/02/22 16:46:56
Silver	0.159	0.155	0.0320		mg/Kg-dry	1	12/02/22 16:46:56
Zinc	58.4	2.71	0.945		mg/Kg-dry	1	12/02/22 16:46:56

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	50.0	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38818 Analyst: AT

Total Organic Carbon	2.86	0.150	0.0412		%-dry	1	12/13/22 15:07:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 1:40:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-010

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD62-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Phenol	ND	54.2	14.3		µg/Kg-dry	1	12/14/22 6:59:59
Bis(2-chloroethyl) ether	ND	90.3	27.6		µg/Kg-dry	1	12/14/22 6:59:59
2-Chlorophenol	ND	72.2	26.1		µg/Kg-dry	1	12/14/22 6:59:59
1,3-Dichlorobenzene	ND	72.2	29.6		µg/Kg-dry	1	12/14/22 6:59:59
1,4-Dichlorobenzene	ND	54.2	23.3		µg/Kg-dry	1	12/14/22 6:59:59
1,2-Dichlorobenzene	ND	72.2	23.9		µg/Kg-dry	1	12/14/22 6:59:59
Benzyl alcohol	ND	271	104	Q	µg/Kg-dry	1	12/14/22 6:59:59
2-Methylphenol (o-cresol)	ND	72.2	28.2		µg/Kg-dry	1	12/14/22 6:59:59
Hexachloroethane	ND	72.2	22.7		µg/Kg-dry	1	12/14/22 6:59:59
N-Nitrosodi-n-propylamine	ND	144	49.6		µg/Kg-dry	1	12/14/22 6:59:59
3&4-Methylphenol (m, p-cresol)	ND	54.2	23.3		µg/Kg-dry	1	12/14/22 6:59:59
Nitrobenzene	ND	90.3	27.6		µg/Kg-dry	1	12/14/22 6:59:59
Isophorone	ND	72.2	23.6		µg/Kg-dry	1	12/14/22 6:59:59
2-Nitrophenol	ND	54.2	23.2		µg/Kg-dry	1	12/14/22 6:59:59
2,4-Dimethylphenol	ND	54.2	10.6		µg/Kg-dry	1	12/14/22 6:59:59
Bis(2-chloroethoxy)methane	ND	54.2	10.2		µg/Kg-dry	1	12/14/22 6:59:59
2,4-Dichlorophenol	ND	54.2	7.96		µg/Kg-dry	1	12/14/22 6:59:59
1,2,4-Trichlorobenzene	ND	54.2	20.3		µg/Kg-dry	1	12/14/22 6:59:59
Naphthalene	29.3	72.2	22.1	J	µg/Kg-dry	1	12/14/22 6:59:59
4-Chloroaniline	ND	54.2	16.1		µg/Kg-dry	1	12/14/22 6:59:59
Hexachlorobutadiene	ND	54.2	15.7		µg/Kg-dry	1	12/14/22 6:59:59
4-Chloro-3-methylphenol	ND	54.2	20.6	Q	µg/Kg-dry	1	12/14/22 6:59:59
2-Methylnaphthalene	ND	54.2	13.3		µg/Kg-dry	1	12/14/22 6:59:59
1-Methylnaphthalene	ND	54.2	9.26		µg/Kg-dry	1	12/14/22 6:59:59
Hexachlorocyclopentadiene	ND	181	40.0	Q	µg/Kg-dry	1	12/14/22 6:59:59
2,4,6-Trichlorophenol	ND	54.2	22.9		µg/Kg-dry	1	12/14/22 6:59:59
2,4,5-Trichlorophenol	ND	54.2	16.0		µg/Kg-dry	1	12/14/22 6:59:59
2-Chloronaphthalene	ND	54.2	11.5		µg/Kg-dry	1	12/14/22 6:59:59
2-Nitroaniline	ND	90.3	35.9		µg/Kg-dry	1	12/14/22 6:59:59
Acenaphthene	ND	54.2	12.6		µg/Kg-dry	1	12/14/22 6:59:59
Dimethylphthalate	ND	6,320	2,910		µg/Kg-dry	1	12/14/22 6:59:59

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 1:40:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-010

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD62-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	72.2	26.1		µg/Kg-dry	1	12/14/22 6:59:59
Acenaphthylene	ND	54.2	11.3		µg/Kg-dry	1	12/14/22 6:59:59
2,4-Dinitrophenol	ND	542	233	Q	µg/Kg-dry	1	12/14/22 6:59:59
Dibenzofuran	ND	54.2	10.8		µg/Kg-dry	1	12/14/22 6:59:59
2,4-Dinitrotoluene	ND	108	43.8		µg/Kg-dry	1	12/14/22 6:59:59
4-Nitrophenol	ND	361	97.4	Q	µg/Kg-dry	1	12/14/22 6:59:59
Fluorene	ND	54.2	9.03		µg/Kg-dry	1	12/14/22 6:59:59
4-Chlorophenyl phenyl ether	ND	54.2	14.6		µg/Kg-dry	1	12/14/22 6:59:59
Diethylphthalate	ND	1,350	434		µg/Kg-dry	1	12/14/22 6:59:59
4,6-Dinitro-2-methylphenol	ND	451	198		µg/Kg-dry	1	12/14/22 6:59:59
4-Bromophenyl phenyl ether	ND	54.2	21.3		µg/Kg-dry	1	12/14/22 6:59:59
Hexachlorobenzene	ND	54.2	10.6		µg/Kg-dry	1	12/14/22 6:59:59
Pentachlorophenol	ND	361	129	Q	µg/Kg-dry	1	12/14/22 6:59:59
Phenanthrene	33.4	54.2	14.3	J	µg/Kg-dry	1	12/14/22 6:59:59
Anthracene	ND	54.2	10.0		µg/Kg-dry	1	12/14/22 6:59:59
Carbazole	ND	54.2	11.7		µg/Kg-dry	1	12/14/22 6:59:59
Di-n-butylphthalate	ND	54.2	19.5		µg/Kg-dry	1	12/14/22 6:59:59
Fluoranthene	78.1	54.2	15.9		µg/Kg-dry	1	12/14/22 6:59:59
Pyrene	ND	271	86.4		µg/Kg-dry	1	12/14/22 6:59:59
Butyl Benzylphthalate	ND	90.3	26.6		µg/Kg-dry	1	12/14/22 6:59:59
bis(2-Ethylhexyl)adipate	ND	361	133		µg/Kg-dry	1	12/14/22 6:59:59
Benz(a)anthracene	30.6	54.2	14.6	J	µg/Kg-dry	1	12/14/22 6:59:59
Chrysene	34.0	90.3	20.8	J	µg/Kg-dry	1	12/14/22 6:59:59
bis (2-Ethylhexyl) phthalate	ND	72.2	20.3	Q	µg/Kg-dry	1	12/14/22 6:59:59
Di-n-octyl phthalate	ND	135	33.7		µg/Kg-dry	1	12/14/22 6:59:59
Benzo(b)fluoranthene	33.7	181	19.1	J	µg/Kg-dry	1	12/14/22 6:59:59
Benzo(k)fluoranthene	ND	54.2	18.1		µg/Kg-dry	1	12/14/22 6:59:59
Benzo(a)pyrene	ND	72.2	26.2		µg/Kg-dry	1	12/14/22 6:59:59
Indeno(1,2,3-cd)pyrene	ND	361	125	Q	µg/Kg-dry	1	12/14/22 6:59:59
Dibenz(a,h)anthracene	ND	181	70.2		µg/Kg-dry	1	12/14/22 6:59:59
Benzo(g,h,i)perylene	ND	181	52.2	Q*	µg/Kg-dry	1	12/14/22 6:59:59

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-010  
**Client Sample ID:** WB-SO-SD62-0005

**Collection Date:** 11/28/2022 1:40:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	71.6	16.2 - 150	0		%Rec	1	12/14/22 6:59:59
Surr: 2-Fluorobiphenyl	72.3	25.3 - 139	0		%Rec	1	12/14/22 6:59:59
Surr: Nitrobenzene-d5	64.9	12.7 - 143	0		%Rec	1	12/14/22 6:59:59
Surr: Phenol-d6	62.1	21.4 - 139	0		%Rec	1	12/14/22 6:59:59
Surr: p-Terphenyl	72.1	37.1 - 144	0		%Rec	1	12/14/22 6:59:59

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.  
\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	5.72	0.456	0.133		mg/Kg-dry	1	12/02/22 16:49:40
Cadmium	0.653	0.304	0.0116		mg/Kg-dry	1	12/02/22 16:49:40
Chromium	45.3	0.836	0.199		mg/Kg-dry	1	12/02/22 16:49:40
Copper	30.7	1.67	0.284		mg/Kg-dry	1	12/02/22 16:49:40
Lead	15.0	0.456	0.0632		mg/Kg-dry	1	12/02/22 16:49:40
Silver	0.158	0.152	0.0313		mg/Kg-dry	1	12/02/22 16:49:40
Zinc	66.0	2.66	0.927		mg/Kg-dry	1	12/02/22 16:49:40

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	49.4	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38840 Analyst: AT

Total Organic Carbon	2.68	0.150	0.0412		%-dry	1	12/14/22 13:55:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 2:05:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-011

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD62-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	56.1	14.8		µg/Kg-dry	1	12/14/22 7:29:39
Bis(2-chloroethyl) ether	ND	93.5	28.6		µg/Kg-dry	1	12/14/22 7:29:39
2-Chlorophenol	ND	74.8	27.0		µg/Kg-dry	1	12/14/22 7:29:39
1,3-Dichlorobenzene	ND	74.8	30.6		µg/Kg-dry	1	12/14/22 7:29:39
1,4-Dichlorobenzene	ND	56.1	24.2		µg/Kg-dry	1	12/14/22 7:29:39
1,2-Dichlorobenzene	ND	74.8	24.8		µg/Kg-dry	1	12/14/22 7:29:39
Benzyl alcohol	ND	281	108	Q	µg/Kg-dry	1	12/14/22 7:29:39
2-Methylphenol (o-cresol)	ND	74.8	29.2		µg/Kg-dry	1	12/14/22 7:29:39
Hexachloroethane	ND	74.8	23.5		µg/Kg-dry	1	12/14/22 7:29:39
N-Nitrosodi-n-propylamine	ND	150	51.4		µg/Kg-dry	1	12/14/22 7:29:39
3&4-Methylphenol (m, p-cresol)	ND	56.1	24.2		µg/Kg-dry	1	12/14/22 7:29:39
Nitrobenzene	ND	93.5	28.6		µg/Kg-dry	1	12/14/22 7:29:39
Isophorone	ND	74.8	24.4		µg/Kg-dry	1	12/14/22 7:29:39
2-Nitrophenol	ND	56.1	24.0		µg/Kg-dry	1	12/14/22 7:29:39
2,4-Dimethylphenol	ND	56.1	11.0		µg/Kg-dry	1	12/14/22 7:29:39
Bis(2-chloroethoxy)methane	ND	56.1	10.6		µg/Kg-dry	1	12/14/22 7:29:39
2,4-Dichlorophenol	ND	56.1	8.25		µg/Kg-dry	1	12/14/22 7:29:39
1,2,4-Trichlorobenzene	ND	56.1	21.0		µg/Kg-dry	1	12/14/22 7:29:39
Naphthalene	ND	74.8	22.9		µg/Kg-dry	1	12/14/22 7:29:39
4-Chloroaniline	ND	56.1	16.7		µg/Kg-dry	1	12/14/22 7:29:39
Hexachlorobutadiene	ND	56.1	16.3		µg/Kg-dry	1	12/14/22 7:29:39
4-Chloro-3-methylphenol	ND	56.1	21.3	Q	µg/Kg-dry	1	12/14/22 7:29:39
2-Methylnaphthalene	ND	56.1	13.7		µg/Kg-dry	1	12/14/22 7:29:39
1-Methylnaphthalene	ND	56.1	9.60		µg/Kg-dry	1	12/14/22 7:29:39
Hexachlorocyclopentadiene	ND	187	41.5	Q	µg/Kg-dry	1	12/14/22 7:29:39
2,4,6-Trichlorophenol	ND	56.1	23.7		µg/Kg-dry	1	12/14/22 7:29:39
2,4,5-Trichlorophenol	ND	56.1	16.6		µg/Kg-dry	1	12/14/22 7:29:39
2-Chloronaphthalene	ND	56.1	11.9		µg/Kg-dry	1	12/14/22 7:29:39
2-Nitroaniline	ND	93.5	37.2		µg/Kg-dry	1	12/14/22 7:29:39
Acenaphthene	ND	56.1	13.1		µg/Kg-dry	1	12/14/22 7:29:39
Dimethylphthalate	ND	6,550	3,020		µg/Kg-dry	1	12/14/22 7:29:39

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 2:05:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-011

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD62-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	74.8	27.1		µg/Kg-dry	1	12/14/22 7:29:39
Acenaphthylene	ND	56.1	11.7		µg/Kg-dry	1	12/14/22 7:29:39
2,4-Dinitrophenol	ND	561	241	Q	µg/Kg-dry	1	12/14/22 7:29:39
Dibenzofuran	ND	56.1	11.2		µg/Kg-dry	1	12/14/22 7:29:39
2,4-Dinitrotoluene	ND	112	45.3		µg/Kg-dry	1	12/14/22 7:29:39
4-Nitrophenol	ND	374	101	Q	µg/Kg-dry	1	12/14/22 7:29:39
Fluorene	ND	56.1	9.35		µg/Kg-dry	1	12/14/22 7:29:39
4-Chlorophenyl phenyl ether	ND	56.1	15.2		µg/Kg-dry	1	12/14/22 7:29:39
Diethylphthalate	ND	1,400	450		µg/Kg-dry	1	12/14/22 7:29:39
4,6-Dinitro-2-methylphenol	ND	468	205		µg/Kg-dry	1	12/14/22 7:29:39
4-Bromophenyl phenyl ether	ND	56.1	22.0		µg/Kg-dry	1	12/14/22 7:29:39
Hexachlorobenzene	ND	56.1	10.9		µg/Kg-dry	1	12/14/22 7:29:39
Pentachlorophenol	ND	374	134	Q	µg/Kg-dry	1	12/14/22 7:29:39
Phenanthrene	ND	56.1	14.8		µg/Kg-dry	1	12/14/22 7:29:39
Anthracene	ND	56.1	10.4		µg/Kg-dry	1	12/14/22 7:29:39
Carbazole	ND	56.1	12.1		µg/Kg-dry	1	12/14/22 7:29:39
Di-n-butylphthalate	ND	56.1	20.2		µg/Kg-dry	1	12/14/22 7:29:39
Fluoranthene	38.4	56.1	16.5	J	µg/Kg-dry	1	12/14/22 7:29:39
Pyrene	ND	281	89.5		µg/Kg-dry	1	12/14/22 7:29:39
Butyl Benzylphthalate	ND	93.5	27.5		µg/Kg-dry	1	12/14/22 7:29:39
bis(2-Ethylhexyl)adipate	ND	374	138		µg/Kg-dry	1	12/14/22 7:29:39
Benz(a)anthracene	22.6	56.1	15.2	J	µg/Kg-dry	1	12/14/22 7:29:39
Chrysene	24.3	93.5	21.5	J	µg/Kg-dry	1	12/14/22 7:29:39
bis (2-Ethylhexyl) phthalate	ND	74.8	21.0	Q	µg/Kg-dry	1	12/14/22 7:29:39
Di-n-octyl phthalate	ND	140	34.9		µg/Kg-dry	1	12/14/22 7:29:39
Benzo(b)fluoranthene	ND	187	19.8		µg/Kg-dry	1	12/14/22 7:29:39
Benzo(k)fluoranthene	ND	56.1	18.8		µg/Kg-dry	1	12/14/22 7:29:39
Benzo(a)pyrene	ND	74.8	27.2		µg/Kg-dry	1	12/14/22 7:29:39
Indeno(1,2,3-cd)pyrene	ND	374	129	Q	µg/Kg-dry	1	12/14/22 7:29:39
Dibenz(a,h)anthracene	ND	187	72.8		µg/Kg-dry	1	12/14/22 7:29:39
Benzo(g,h,i)perylene	ND	187	54.1	Q*	µg/Kg-dry	1	12/14/22 7:29:39

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-011  
**Client Sample ID:** WB-SO-SD62-0020

**Collection Date:** 11/28/2022 2:05:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	73.0	16.2 - 150	0		%Rec	1	12/14/22 7:29:39
Surr: 2-Fluorobiphenyl	73.7	25.3 - 139	0		%Rec	1	12/14/22 7:29:39
Surr: Nitrobenzene-d5	66.5	12.7 - 143	0		%Rec	1	12/14/22 7:29:39
Surr: Phenol-d6	64.5	21.4 - 139	0		%Rec	1	12/14/22 7:29:39
Surr: p-Terphenyl	72.8	37.1 - 144	0		%Rec	1	12/14/22 7:29:39

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.  
\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	6.25	0.494	0.144		mg/Kg-dry	1	12/02/22 16:57:52
Cadmium	0.691	0.329	0.0125		mg/Kg-dry	1	12/02/22 16:57:52
Chromium	37.1	0.905	0.215		mg/Kg-dry	1	12/02/22 16:57:52
Copper	36.6	1.81	0.308		mg/Kg-dry	1	12/02/22 16:57:52
Lead	10.5	0.494	0.0685		mg/Kg-dry	1	12/02/22 16:57:52
Silver	0.158	0.165	0.0339	J	mg/Kg-dry	1	12/02/22 16:57:52
Zinc	69.6	2.88	1.00		mg/Kg-dry	1	12/02/22 16:57:52

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	52.5	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38840 Analyst: AT

Total Organic Carbon	2.21	0.150	0.0412		%-dry	1	12/14/22 14:10:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-012  
**Client Sample ID:** WB-SO-SD63-0005

**Collection Date:** 11/28/2022 2:30:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	69.7	18.4		µg/Kg-dry	1	12/14/22 7:59:31
Bis(2-chloroethyl) ether	ND	116	35.5		µg/Kg-dry	1	12/14/22 7:59:31
2-Chlorophenol	ND	92.9	33.5		µg/Kg-dry	1	12/14/22 7:59:31
1,3-Dichlorobenzene	ND	92.9	38.0		µg/Kg-dry	1	12/14/22 7:59:31
1,4-Dichlorobenzene	ND	69.7	30.0		µg/Kg-dry	1	12/14/22 7:59:31
1,2-Dichlorobenzene	ND	92.9	30.8		µg/Kg-dry	1	12/14/22 7:59:31
Benzyl alcohol	ND	348	134	Q	µg/Kg-dry	1	12/14/22 7:59:31
2-Methylphenol (o-cresol)	ND	92.9	36.2		µg/Kg-dry	1	12/14/22 7:59:31
Hexachloroethane	ND	92.9	29.2		µg/Kg-dry	1	12/14/22 7:59:31
N-Nitrosodi-n-propylamine	ND	186	63.8		µg/Kg-dry	1	12/14/22 7:59:31
3&4-Methylphenol (m, p-cresol)	ND	69.7	30.0		µg/Kg-dry	1	12/14/22 7:59:31
Nitrobenzene	ND	116	35.5		µg/Kg-dry	1	12/14/22 7:59:31
Isophorone	ND	92.9	30.3		µg/Kg-dry	1	12/14/22 7:59:31
2-Nitrophenol	ND	69.7	29.8		µg/Kg-dry	1	12/14/22 7:59:31
2,4-Dimethylphenol	ND	69.7	13.6		µg/Kg-dry	1	12/14/22 7:59:31
Bis(2-chloroethoxy)methane	ND	69.7	13.2		µg/Kg-dry	1	12/14/22 7:59:31
2,4-Dichlorophenol	ND	69.7	10.2		µg/Kg-dry	1	12/14/22 7:59:31
1,2,4-Trichlorobenzene	ND	69.7	26.1		µg/Kg-dry	1	12/14/22 7:59:31
Naphthalene	ND	92.9	28.4		µg/Kg-dry	1	12/14/22 7:59:31
4-Chloroaniline	ND	69.7	20.7		µg/Kg-dry	1	12/14/22 7:59:31
Hexachlorobutadiene	ND	69.7	20.2		µg/Kg-dry	1	12/14/22 7:59:31
4-Chloro-3-methylphenol	ND	69.7	26.5	Q	µg/Kg-dry	1	12/14/22 7:59:31
2-Methylnaphthalene	ND	69.7	17.1		µg/Kg-dry	1	12/14/22 7:59:31
1-Methylnaphthalene	ND	69.7	11.9		µg/Kg-dry	1	12/14/22 7:59:31
Hexachlorocyclopentadiene	ND	232	51.5	Q	µg/Kg-dry	1	12/14/22 7:59:31
2,4,6-Trichlorophenol	ND	69.7	29.4		µg/Kg-dry	1	12/14/22 7:59:31
2,4,5-Trichlorophenol	ND	69.7	20.6		µg/Kg-dry	1	12/14/22 7:59:31
2-Chloronaphthalene	ND	69.7	14.7		µg/Kg-dry	1	12/14/22 7:59:31
2-Nitroaniline	ND	116	46.1		µg/Kg-dry	1	12/14/22 7:59:31
Acenaphthene	ND	69.7	16.2		µg/Kg-dry	1	12/14/22 7:59:31
Dimethylphthalate	ND	8,130	3,750		µg/Kg-dry	1	12/14/22 7:59:31

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-012  
**Client Sample ID:** WB-SO-SD63-0005

**Collection Date:** 11/28/2022 2:30:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	92.9	33.6		µg/Kg-dry	1	12/14/22 7:59:31
Acenaphthylene	ND	69.7	14.6		µg/Kg-dry	1	12/14/22 7:59:31
2,4-Dinitrophenol	ND	697	299	Q	µg/Kg-dry	1	12/14/22 7:59:31
Dibenzofuran	ND	69.7	13.9		µg/Kg-dry	1	12/14/22 7:59:31
2,4-Dinitrotoluene	ND	139	56.3		µg/Kg-dry	1	12/14/22 7:59:31
4-Nitrophenol	ND	464	125	Q	µg/Kg-dry	1	12/14/22 7:59:31
Fluorene	ND	69.7	11.6		µg/Kg-dry	1	12/14/22 7:59:31
4-Chlorophenyl phenyl ether	ND	69.7	18.8		µg/Kg-dry	1	12/14/22 7:59:31
Diethylphthalate	ND	1,740	558		µg/Kg-dry	1	12/14/22 7:59:31
4,6-Dinitro-2-methylphenol	ND	580	255		µg/Kg-dry	1	12/14/22 7:59:31
4-Bromophenyl phenyl ether	ND	69.7	27.3		µg/Kg-dry	1	12/14/22 7:59:31
Hexachlorobenzene	ND	69.7	13.6		µg/Kg-dry	1	12/14/22 7:59:31
Pentachlorophenol	ND	464	166	Q	µg/Kg-dry	1	12/14/22 7:59:31
Phenanthrene	22.3	69.7	18.4	J	µg/Kg-dry	1	12/14/22 7:59:31
Anthracene	ND	69.7	12.9		µg/Kg-dry	1	12/14/22 7:59:31
Carbazole	ND	69.7	15.0		µg/Kg-dry	1	12/14/22 7:59:31
Di-n-butylphthalate	ND	69.7	25.1		µg/Kg-dry	1	12/14/22 7:59:31
Fluoranthene	58.6	69.7	20.5	J	µg/Kg-dry	1	12/14/22 7:59:31
Pyrene	ND	348	111		µg/Kg-dry	1	12/14/22 7:59:31
Butyl Benzylphthalate	ND	116	34.2		µg/Kg-dry	1	12/14/22 7:59:31
bis(2-Ethylhexyl)adipate	ND	464	171		µg/Kg-dry	1	12/14/22 7:59:31
Benz(a)anthracene	32.8	69.7	18.8	J	µg/Kg-dry	1	12/14/22 7:59:31
Chrysene	32.5	116	26.7	J	µg/Kg-dry	1	12/14/22 7:59:31
bis (2-Ethylhexyl) phthalate	ND	92.9	26.1	Q	µg/Kg-dry	1	12/14/22 7:59:31
Di-n-octyl phthalate	ND	174	43.3		µg/Kg-dry	1	12/14/22 7:59:31
Benzo(b)fluoranthene	ND	232	24.6		µg/Kg-dry	1	12/14/22 7:59:31
Benzo(k)fluoranthene	ND	69.7	23.3		µg/Kg-dry	1	12/14/22 7:59:31
Benzo(a)pyrene	ND	92.9	33.8		µg/Kg-dry	1	12/14/22 7:59:31
Indeno(1,2,3-cd)pyrene	ND	464	160	Q	µg/Kg-dry	1	12/14/22 7:59:31
Dibenz(a,h)anthracene	ND	232	90.3		µg/Kg-dry	1	12/14/22 7:59:31
Benzo(g,h,i)perylene	ND	232	67.2	Q*	µg/Kg-dry	1	12/14/22 7:59:31

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-012  
**Client Sample ID:** WB-SO-SD63-0005

**Collection Date:** 11/28/2022 2:30:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	73.0	16.2 - 150	0		%Rec	1	12/14/22 7:59:31
Surr: 2-Fluorobiphenyl	73.3	25.3 - 139	0		%Rec	1	12/14/22 7:59:31
Surr: Nitrobenzene-d5	66.2	12.7 - 143	0		%Rec	1	12/14/22 7:59:31
Surr: Phenol-d6	64.2	21.4 - 139	0		%Rec	1	12/14/22 7:59:31
Surr: p-Terphenyl	70.4	37.1 - 144	0		%Rec	1	12/14/22 7:59:31

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.  
\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	7.52	0.613	0.179		mg/Kg-dry	1	12/02/22 17:00:35
Cadmium	0.509	0.409	0.0156		mg/Kg-dry	1	12/02/22 17:00:35
Chromium	35.0	1.12	0.267		mg/Kg-dry	1	12/02/22 17:00:35
Copper	50.4	2.25	0.382		mg/Kg-dry	1	12/02/22 17:00:35
Lead	11.4	0.613	0.0850		mg/Kg-dry	1	12/02/22 17:00:35
Silver	0.190	0.204	0.0421	J	mg/Kg-dry	1	12/02/22 17:00:35
Zinc	81.0	3.57	1.25		mg/Kg-dry	1	12/02/22 17:00:35

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	61.8	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38840 Analyst: AT

Total Organic Carbon	3.40	0.150	0.0412		%-dry	1	12/14/22 14:26:00
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# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-013  
**Client Sample ID:** WB-SO-SD63-0020

**Collection Date:** 11/28/2022 2:45:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	59.2	15.6		µg/Kg-dry	1	12/14/22 8:29:25
Bis(2-chloroethyl) ether	ND	98.7	30.2		µg/Kg-dry	1	12/14/22 8:29:25
2-Chlorophenol	ND	78.9	28.5		µg/Kg-dry	1	12/14/22 8:29:25
1,3-Dichlorobenzene	ND	78.9	32.3		µg/Kg-dry	1	12/14/22 8:29:25
1,4-Dichlorobenzene	ND	59.2	25.5		µg/Kg-dry	1	12/14/22 8:29:25
1,2-Dichlorobenzene	ND	78.9	26.1		µg/Kg-dry	1	12/14/22 8:29:25
Benzyl alcohol	ND	296	114	Q	µg/Kg-dry	1	12/14/22 8:29:25
2-Methylphenol (o-cresol)	ND	78.9	30.8		µg/Kg-dry	1	12/14/22 8:29:25
Hexachloroethane	ND	78.9	24.8		µg/Kg-dry	1	12/14/22 8:29:25
N-Nitrosodi-n-propylamine	ND	158	54.2		µg/Kg-dry	1	12/14/22 8:29:25
3&4-Methylphenol (m, p-cresol)	ND	59.2	25.5		µg/Kg-dry	1	12/14/22 8:29:25
Nitrobenzene	ND	98.7	30.2		µg/Kg-dry	1	12/14/22 8:29:25
Isophorone	ND	78.9	25.8		µg/Kg-dry	1	12/14/22 8:29:25
2-Nitrophenol	ND	59.2	25.3		µg/Kg-dry	1	12/14/22 8:29:25
2,4-Dimethylphenol	ND	59.2	11.6		µg/Kg-dry	1	12/14/22 8:29:25
Bis(2-chloroethoxy)methane	ND	59.2	11.2		µg/Kg-dry	1	12/14/22 8:29:25
2,4-Dichlorophenol	ND	59.2	8.70		µg/Kg-dry	1	12/14/22 8:29:25
1,2,4-Trichlorobenzene	ND	59.2	22.2		µg/Kg-dry	1	12/14/22 8:29:25
Naphthalene	ND	78.9	24.1		µg/Kg-dry	1	12/14/22 8:29:25
4-Chloroaniline	ND	59.2	17.6		µg/Kg-dry	1	12/14/22 8:29:25
Hexachlorobutadiene	ND	59.2	17.2		µg/Kg-dry	1	12/14/22 8:29:25
4-Chloro-3-methylphenol	ND	59.2	22.5	Q	µg/Kg-dry	1	12/14/22 8:29:25
2-Methylnaphthalene	ND	59.2	14.5		µg/Kg-dry	1	12/14/22 8:29:25
1-Methylnaphthalene	ND	59.2	10.1		µg/Kg-dry	1	12/14/22 8:29:25
Hexachlorocyclopentadiene	ND	197	43.8	Q	µg/Kg-dry	1	12/14/22 8:29:25
2,4,6-Trichlorophenol	ND	59.2	25.0		µg/Kg-dry	1	12/14/22 8:29:25
2,4,5-Trichlorophenol	ND	59.2	17.5		µg/Kg-dry	1	12/14/22 8:29:25
2-Chloronaphthalene	ND	59.2	12.5		µg/Kg-dry	1	12/14/22 8:29:25
2-Nitroaniline	ND	98.7	39.2		µg/Kg-dry	1	12/14/22 8:29:25
Acenaphthene	ND	59.2	13.8		µg/Kg-dry	1	12/14/22 8:29:25
Dimethylphthalate	ND	6,910	3,190		µg/Kg-dry	1	12/14/22 8:29:25

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/28/2022 2:45:00 PM

**Project:** Solid Wood Inc

**Lab ID:** 2211603-013

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD63-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	78.9	28.5		µg/Kg-dry	1	12/14/22 8:29:25
Acenaphthylene	ND	59.2	12.4		µg/Kg-dry	1	12/14/22 8:29:25
2,4-Dinitrophenol	ND	592	255	Q	µg/Kg-dry	1	12/14/22 8:29:25
Dibenzofuran	ND	59.2	11.8		µg/Kg-dry	1	12/14/22 8:29:25
2,4-Dinitrotoluene	ND	118	47.8		µg/Kg-dry	1	12/14/22 8:29:25
4-Nitrophenol	ND	395	106	Q	µg/Kg-dry	1	12/14/22 8:29:25
Fluorene	ND	59.2	9.87		µg/Kg-dry	1	12/14/22 8:29:25
4-Chlorophenyl phenyl ether	ND	59.2	16.0		µg/Kg-dry	1	12/14/22 8:29:25
Diethylphthalate	ND	1,480	475		µg/Kg-dry	1	12/14/22 8:29:25
4,6-Dinitro-2-methylphenol	ND	493	217		µg/Kg-dry	1	12/14/22 8:29:25
4-Bromophenyl phenyl ether	ND	59.2	23.2		µg/Kg-dry	1	12/14/22 8:29:25
Hexachlorobenzene	ND	59.2	11.5		µg/Kg-dry	1	12/14/22 8:29:25
Pentachlorophenol	ND	395	141	Q	µg/Kg-dry	1	12/14/22 8:29:25
Phenanthrene	ND	59.2	15.6		µg/Kg-dry	1	12/14/22 8:29:25
Anthracene	ND	59.2	10.9		µg/Kg-dry	1	12/14/22 8:29:25
Carbazole	ND	59.2	12.8		µg/Kg-dry	1	12/14/22 8:29:25
Di-n-butylphthalate	ND	59.2	21.3		µg/Kg-dry	1	12/14/22 8:29:25
Fluoranthene	51.6	59.2	17.4	J	µg/Kg-dry	1	12/14/22 8:29:25
Pyrene	ND	296	94.4		µg/Kg-dry	1	12/14/22 8:29:25
Butyl Benzylphthalate	ND	98.7	29.1		µg/Kg-dry	1	12/14/22 8:29:25
bis(2-Ethylhexyl)adipate	ND	395	145		µg/Kg-dry	1	12/14/22 8:29:25
Benz(a)anthracene	16.4	59.2	16.0	J	µg/Kg-dry	1	12/14/22 8:29:25
Chrysene	ND	98.7	22.7		µg/Kg-dry	1	12/14/22 8:29:25
bis (2-Ethylhexyl) phthalate	ND	78.9	22.2	Q	µg/Kg-dry	1	12/14/22 8:29:25
Di-n-octyl phthalate	ND	148	36.8		µg/Kg-dry	1	12/14/22 8:29:25
Benzo(b)fluoranthene	ND	197	20.9		µg/Kg-dry	1	12/14/22 8:29:25
Benzo(k)fluoranthene	ND	59.2	19.8		µg/Kg-dry	1	12/14/22 8:29:25
Benzo(a)pyrene	ND	78.9	28.7		µg/Kg-dry	1	12/14/22 8:29:25
Indeno(1,2,3-cd)pyrene	ND	395	136	Q	µg/Kg-dry	1	12/14/22 8:29:25
Dibenz(a,h)anthracene	ND	197	76.8		µg/Kg-dry	1	12/14/22 8:29:25
Benzo(g,h,i)perylene	ND	197	57.1	Q*	µg/Kg-dry	1	12/14/22 8:29:25

Original



# Analytical Report

Work Order: 2211603  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc  
**Lab ID:** 2211603-013  
**Client Sample ID:** WB-SO-SD63-0020

**Collection Date:** 11/28/2022 2:45:00 PM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	76.6	16.2 - 150	0		%Rec	1	12/14/22 8:29:25
Surr: 2-Fluorobiphenyl	79.4	25.3 - 139	0		%Rec	1	12/14/22 8:29:25
Surr: Nitrobenzene-d5	69.8	12.7 - 143	0		%Rec	1	12/14/22 8:29:25
Surr: Phenol-d6	69.9	21.4 - 139	0		%Rec	1	12/14/22 8:29:25
Surr: p-Terphenyl	80.3	37.1 - 144	0		%Rec	1	12/14/22 8:29:25

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	8.18	0.509	0.148		mg/Kg-dry	1	12/02/22 17:03:19
Cadmium	0.888	0.339	0.0129		mg/Kg-dry	1	12/02/22 17:03:19
Chromium	37.4	0.933	0.222		mg/Kg-dry	1	12/02/22 17:03:19
Copper	48.9	1.87	0.317		mg/Kg-dry	1	12/02/22 17:03:19
Lead	13.0	0.509	0.0705		mg/Kg-dry	1	12/02/22 17:03:19
Silver	0.207	0.170	0.0349		mg/Kg-dry	1	12/02/22 17:03:19
Zinc	86.1	2.97	1.03		mg/Kg-dry	1	12/02/22 17:03:19

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	55.3	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38840 Analyst: AT

Total Organic Carbon	2.68	0.150	0.0412		%-dry	1	12/14/22 14:41:00
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**Work Order:** 2211603  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc

**QC SUMMARY REPORT**  
**Total Organic Carbon by EPA 9060**

Sample ID: <b>MB-38800</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>12/12/2022</b>	RunNo: <b>80446</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38800</b>	Analysis Date: <b>12/12/2022</b>	SeqNo: <b>1662689</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.0412									MDL

**NOTES:**  
 MDL - Analyte reported to Method Detection Limit (MDL)

Sample ID: <b>LCS-38800</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/12/2022</b>	RunNo: <b>80446</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38800</b>	Analysis Date: <b>12/12/2022</b>	SeqNo: <b>1662690</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.993	0.150	1.000	0	99.3	80	120				

Sample ID: <b>2211395-003ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>12/12/2022</b>	RunNo: <b>80446</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38800</b>	Analysis Date: <b>12/12/2022</b>	SeqNo: <b>1662692</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.150						0	0	20	

Sample ID: <b>2211395-003AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/12/2022</b>	RunNo: <b>80446</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38800</b>	Analysis Date: <b>12/12/2022</b>	SeqNo: <b>1662693</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.04	0.150	1.000	0	104	75	125				

Sample ID: <b>2211395-003AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>12/12/2022</b>	RunNo: <b>80446</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38800</b>	Analysis Date: <b>12/12/2022</b>	SeqNo: <b>1662694</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.03	0.150	1.000	0	103	75	125	1.038	0.483	20	

**Work Order:** 2211603  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc

**QC SUMMARY REPORT**  
**Total Organic Carbon by EPA 9060**

Sample ID: <b>MB-38818</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80481</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38818</b>	Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1663619</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.150									

Sample ID: <b>LCS-38818</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80481</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38818</b>	Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1663620</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.998	0.150	1.000	0	99.8	80	120				

Sample ID: <b>2211603-009ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80481</b>							
Client ID: <b>WB-SO-SD61-0020</b>	Batch ID: <b>38818</b>	Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1663627</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.73	0.150						2.858	4.47	20	

Sample ID: <b>2211603-009AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80481</b>							
Client ID: <b>WB-SO-SD61-0020</b>	Batch ID: <b>38818</b>	Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1663628</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.45	0.150	1.000	2.858	59.6	75	125				S

**NOTES:**

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: <b>2211603-009AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80481</b>							
Client ID: <b>WB-SO-SD61-0020</b>	Batch ID: <b>38818</b>	Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1663629</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.35	0.150	1.000	2.858	49.5	75	125	3.454	2.97	20	S

**NOTES:**

S - Outlying spike recovery(ies) observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Total Organic Carbon by EPA 9060**

Sample ID: <b>MB-38840</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38840</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664076</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.150									

Sample ID: <b>LCS-38840</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38840</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664077</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.07	0.150	1.000	0	107	80	120				

Sample ID: <b>2211613-002ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38840</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664084</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.13	0.150						1.856	13.8	20	

Sample ID: <b>2211613-002AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38840</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664085</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.70	0.150	1.000	1.856	84.6	75	125				

Sample ID: <b>2211613-002AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38840</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664086</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.78	0.150	1.000	1.856	92.8	75	125	2.702	2.99	20	

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>MB-38685</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38685</b>		Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657277</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.240									
Cadmium	ND	0.160									
Chromium	ND	0.440									
Copper	ND	0.880									
Lead	ND	0.240									
Silver	ND	0.0800									
Zinc	ND	1.40									

Sample ID: <b>LCS-38685</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38685</b>		Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657278</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	36.9	0.236	39.37	0	93.8	80	120				
Cadmium	1.94	0.157	1.969	0	98.3	80	120				
Chromium	35.4	0.433	39.37	0	89.8	80	120				
Copper	38.8	0.866	39.37	0	98.5	80	120				
Lead	21.3	0.236	19.69	0	108	80	120				
Silver	1.97	0.0787	1.969	0	100	80	120				
Zinc	37.3	1.38	39.37	0	94.8	80	120				

Sample ID: <b>2211536-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>		Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657281</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	60.3	0.231	38.42	30.87	76.5	75	125				I
Cadmium	2.01	0.154	1.921	0.2830	90.0	75	125				I
Chromium	85.9	0.423	38.42	62.95	59.8	75	125				SI
Copper	183	0.845	38.42	186.0	-6.70	75	125				SI
Lead	36.4	0.231	19.21	24.00	64.7	75	125				SI
Silver	2.39	0.0768	1.921	1.081	68.1	75	125				SI
Zinc	840	1.34	38.42	950.5	-287	75	125				ESI

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>2211536-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>	Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657281</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

**NOTES:**

S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.  
 I - Internal standards were outside of acceptance criteria. Re-analysis and/or matrix spike samples yielded the same result indicating a possible matrix effect.

Sample ID: <b>2211536-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>	Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657282</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	54.3	0.231	38.42	30.87	60.9	75	125	60.26	10.4	20	SI
Cadmium	1.79	0.154	1.921	0.2830	78.5	75	125	2.012	11.6	20	I
Chromium	76.0	0.423	38.42	62.95	34.0	75	125	85.94	12.2	20	SI
Copper	166	0.845	38.42	186.0	-51.0	75	125	183.4	9.74	20	SI
Lead	32.0	0.231	19.21	24.00	41.5	75	125	36.43	13.0	20	SI
Silver	2.18	0.0768	1.921	1.081	57.0	75	125	2.389	9.36	20	SI
Zinc	768	1.34	38.42	950.5	-474	75	125	840.3	8.93	20	ESI

**NOTES:**

S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.  
 I - Internal standards were outside of acceptance criteria. Re-analysis and/or matrix spike samples yielded the same result indicating a possible matrix effect.

Sample ID: <b>2211536-001APDS</b>	SampType: <b>PDS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>	Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657283</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	73.5	0.231	38.4	30.9	111	75	125				I
Cadmium	2.48	0.154	1.92	0.283	114	75	125				I
Chromium	106	0.423	38.4	63.0	113	75	125				I
Copper	219	0.845	38.4	186	86.4	75	125				EI
Lead	45.1	0.231	19.2	24.0	110	75	125				I
Silver	2.83	0.0768	1.92	1.08	91.3	75	125				I
Zinc	1,000	1.34	38.4	950	132	75	125				ESI

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724A</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>			Prep Date: <b>12/13/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1668259</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	945	30.0	1,000	0	94.5	80	120				
Bis(2-chloroethyl) ether	903	50.0	1,000	0	90.3	80	120				
2-Chlorophenol	877	40.0	1,000	0	87.7	80	120				
1,3-Dichlorobenzene	923	40.0	1,000	0	92.3	80	120				
1,4-Dichlorobenzene	915	30.0	1,000	0	91.5	80	120				
1,2-Dichlorobenzene	924	40.0	1,000	0	92.4	80	120				
Benzyl alcohol	54.4	50.0	1,000	0	5.44	80	120				S
2-Methylphenol (o-cresol)	831	40.0	1,000	0	83.1	80	120				
Hexachloroethane	935	40.0	1,000	0	93.5	80	120				
N-Nitrosodi-n-propylamine	840	80.0	1,000	0	84.0	80	120				
3&4-Methylphenol (m, p-cresol)	786	30.0	1,000	0	78.6	80	120				S
Nitrobenzene	917	50.0	1,000	0	91.7	80	120				
Isophorone	861	40.0	1,000	0	86.1	80	120				
2-Nitrophenol	1,030	30.0	1,000	0	103	80	120				
2,4-Dimethylphenol	804	30.0	1,000	0	80.4	80	120				
Bis(2-chloroethoxy)methane	896	30.0	1,000	0	89.6	80	120				
2,4-Dichlorophenol	817	30.0	1,000	0	81.7	80	120				
1,2,4-Trichlorobenzene	917	30.0	1,000	0	91.7	80	120				
Naphthalene	923	40.0	1,000	0	92.3	80	120				
4-Chloroaniline	815	30.0	1,000	0	81.5	80	120				
Hexachlorobutadiene	979	30.0	1,000	0	97.9	80	120				
4-Chloro-3-methylphenol	723	30.0	1,000	0	72.3	80	120				S
2-Methylnaphthalene	891	30.0	1,000	0	89.1	80	120				
1-Methylnaphthalene	894	30.0	1,000	0	89.4	80	120				
Hexachlorocyclopentadiene	994	100	1,000	0	99.4	80	120				
2,4,6-Trichlorophenol	889	30.0	1,000	0	88.9	80	120				
2,4,5-Trichlorophenol	847	30.0	1,000	0	84.7	80	120				
2-Chloronaphthalene	879	30.0	1,000	0	87.9	80	120				
2-Nitroaniline	866	50.0	1,000	0	86.6	80	120				
Acenaphthene	898	30.0	1,000	0	89.8	80	120				
Dimethylphthalate	875	800	1,000	0	87.5	80	120				
2,6-Dinitrotoluene	916	40.0	1,000	0	91.6	80	120				



Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724A</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>			Prep Date: <b>12/13/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1668259</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthylene	901	30.0	1,000	0	90.1	80	120				
2,4-Dinitrophenol	1,780	300	2,000	0	89.0	80	120				
Dibenzofuran	880	30.0	1,000	0	88.0	80	120				
2,4-Dinitrotoluene	848	60.0	1,000	0	84.8	80	120				
4-Nitrophenol	744	200	1,000	0	74.4	80	120				S
Fluorene	879	30.0	1,000	0	87.9	80	120				
4-Chlorophenyl phenyl ether	914	30.0	1,000	0	91.4	80	120				
Diethylphthalate	820	750	1,000	0	82.0	80	120				
4,6-Dinitro-2-methylphenol	852	250	1,000	0	85.2	80	120				
4-Bromophenyl phenyl ether	913	30.0	1,000	0	91.3	80	120				
Hexachlorobenzene	911	30.0	1,000	0	91.1	80	120				
Pentachlorophenol	885	200	1,000	0	88.5	80	120				
Phenanthrene	892	30.0	1,000	0	89.2	80	120				
Anthracene	879	30.0	1,000	0	87.9	80	120				
Carbazole	839	30.0	1,000	0	83.9	80	120				
Di-n-butylphthalate	871	30.0	1,000	0	87.1	80	120				
Fluoranthene	882	30.0	1,000	0	88.2	80	120				
Pyrene	877	150	1,000	0	87.7	80	120				
Butyl Benzylphthalate	867	50.0	1,000	0	86.7	80	120				
bis(2-Ethylhexyl)adipate	827	200	1,000	0	82.7	80	120				
Benz(a)anthracene	882	30.0	1,000	0	88.2	80	120				
Chrysene	884	50.0	1,000	0	88.4	80	120				
bis (2-Ethylhexyl) phthalate	802	40.0	1,000	0	80.2	80	120				
Di-n-octyl phthalate	812	75.0	1,000	0	81.2	80	120				
Benzo(b)fluoranthene	851	100	1,000	0	85.1	80	120				
Benzo(k)fluoranthene	985	30.0	1,000	0	98.5	80	120				
Benzo(a)pyrene	857	40.0	1,000	0	85.7	80	120				
Indeno(1,2,3-cd)pyrene	885	200	1,000	0	88.5	80	120				
Dibenz(a,h)anthracene	907	100	1,000	0	90.7	80	120				
Benzo(g,h,i)perylene	853	100	1,000	0	85.3	80	120				
Surr: 2,4,6-Tribromophenol	925		1,000		92.5	65.9	141				
Surr: 2-Fluorobiphenyl	464		500.0		92.8	73.1	130				

**Work Order:** 2211603  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724A</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1668259</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Nitrobenzene-d5	450		500.0		90.0	77.9	122				
Surr: Phenol-d6	764		1,000		76.4	78.9	117				S
Surr: p-Terphenyl	456		500.0		91.1	71.7	131				

**NOTES:**  
S - Outlying spike recovery observed (low bias). Samples will be qualified with a Q.

Sample ID: <b>MB-38692</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666478</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	ND	30.0									
Bis(2-chloroethyl) ether	ND	50.0									
2-Chlorophenol	ND	40.0									
1,3-Dichlorobenzene	ND	40.0									
1,4-Dichlorobenzene	ND	30.0									
1,2-Dichlorobenzene	ND	40.0									
Benzyl alcohol	ND	150									Q
2-Methylphenol (o-cresol)	ND	40.0									Q
Hexachloroethane	ND	40.0									
N-Nitrosodi-n-propylamine	ND	80.0									
3&4-Methylphenol (m, p-cresol)	ND	30.0									
Nitrobenzene	ND	50.0									
Isophorone	ND	40.0									
2-Nitrophenol	ND	30.0									
2,4-Dimethylphenol	ND	30.0									
Bis(2-chloroethoxy)methane	ND	30.0									
2,4-Dichlorophenol	ND	30.0									
1,2,4-Trichlorobenzene	ND	30.0									
Naphthalene	ND	40.0									
4-Chloroaniline	ND	30.0									
Hexachlorobutadiene	ND	30.0									
4-Chloro-3-methylphenol	ND	30.0									Q

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38692</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666478</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

2-Methylnaphthalene	ND	30.0									
1-Methylnaphthalene	ND	30.0									
Hexachlorocyclopentadiene	ND	100									
2,4,6-Trichlorophenol	ND	30.0									
2,4,5-Trichlorophenol	ND	30.0									
2-Chloronaphthalene	ND	30.0									
2-Nitroaniline	ND	50.0									
Acenaphthene	ND	30.0									
Dimethylphthalate	ND	3,500									
2,6-Dinitrotoluene	ND	40.0									
Acenaphthylene	ND	30.0									
2,4-Dinitrophenol	ND	300									
Dibenzofuran	ND	30.0									
2,4-Dinitrotoluene	ND	60.0									
4-Nitrophenol	ND	200									Q
Fluorene	ND	30.0									
4-Chlorophenyl phenyl ether	ND	30.0									
Diethylphthalate	ND	750									
4,6-Dinitro-2-methylphenol	ND	250									
4-Bromophenyl phenyl ether	ND	30.0									
Hexachlorobenzene	ND	30.0									
Pentachlorophenol	ND	200									
Phenanthrene	ND	30.0									
Anthracene	ND	30.0									
Carbazole	ND	30.0									
Di-n-butylphthalate	ND	30.0									
Fluoranthene	ND	30.0									
Pyrene	ND	150									
Butyl Benzylphthalate	ND	50.0									
bis(2-Ethylhexyl)adipate	ND	200									
Benz(a)anthracene	ND	30.0									
Chrysene	ND	50.0									

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38692</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666478</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

bis (2-Ethylhexyl) phthalate	ND	40.0									
Di-n-octyl phthalate	ND	75.0									
Benzo(b)fluoranthene	ND	100									
Benzo(k)fluoranthene	ND	30.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	200									
Dibenz(a,h)anthracene	ND	100									
Benzo(g,h,i)perylene	ND	100									
Surr: 2,4,6-Tribromophenol	1,490		2,000		74.7	16.2	150				
Surr: 2-Fluorobiphenyl	889		1,000		88.9	25.3	139				
Surr: Nitrobenzene-d5	832		1,000		83.2	12.7	143				
Surr: Phenol-d6	1,570		2,000		78.5	21.4	139				
Surr: p-Terphenyl	853		1,000		85.3	37.1	144				

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: <b>LCS-38692</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666479</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,700	30.0	2,000	0	85.2	54	114				
Bis(2-chloroethyl) ether	1,690	50.0	2,000	0	84.7	60.2	120				
2-Chlorophenol	1,760	40.0	2,000	0	88.0	63.8	111				
1,3-Dichlorobenzene	1,720	40.0	2,000	0	86.2	64.5	110				
1,4-Dichlorobenzene	1,720	30.0	2,000	0	85.8	64.3	112				
1,2-Dichlorobenzene	1,730	40.0	2,000	0	86.4	64.2	112				
Benzyl alcohol	428	150	2,000	0	21.4	5	159				
2-Methylphenol (o-cresol)	1,550	40.0	2,000	0	77.7	51.8	116				
Hexachloroethane	1,730	40.0	2,000	0	86.5	62.1	114				
N-Nitrosodi-n-propylamine	1,730	80.0	2,000	0	86.3	59.1	123				
3&4-Methylphenol (m, p-cresol)	1,520	30.0	2,000	0	76.2	55.3	120				
Nitrobenzene	1,760	50.0	2,000	0	87.9	63.1	119				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38692</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666479</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Isophorone	1,760	40.0	2,000	0	88.2	63.7	120				
2-Nitrophenol	1,800	30.0	2,000	0	90.0	66.4	116				
2,4-Dimethylphenol	1,600	30.0	2,000	0	79.9	55.5	112				
Bis(2-chloroethoxy)methane	1,770	30.0	2,000	0	88.7	64.6	112				
2,4-Dichlorophenol	1,630	30.0	2,000	0	81.6	57.1	116				
1,2,4-Trichlorobenzene	1,790	30.0	2,000	0	89.5	64.7	110				
Naphthalene	1,790	40.0	2,000	0	89.4	64.7	110				
4-Chloroaniline	1,600	30.0	2,000	0	80.1	64.6	112				
Hexachlorobutadiene	1,790	30.0	2,000	0	89.7	64.7	116				
4-Chloro-3-methylphenol	1,360	30.0	2,000	0	68.0	50.9	128				
2-Methylnaphthalene	1,750	30.0	2,000	0	87.3	63.6	119				
1-Methylnaphthalene	1,780	30.0	2,000	0	88.9	64.1	114				
Hexachlorocyclopentadiene	1,920	100	2,000	0	96.1	34.7	141				
2,4,6-Trichlorophenol	1,820	30.0	2,000	0	91.0	60.9	123				
2,4,5-Trichlorophenol	1,710	30.0	2,000	0	85.4	48.7	128				
2-Chloronaphthalene	1,770	30.0	2,000	0	88.5	65.4	114				
2-Nitroaniline	1,780	50.0	2,000	0	88.9	62.3	127				
Acenaphthene	1,790	30.0	2,000	0	89.4	63.3	118				
Dimethylphthalate	1810	3,500	2,000	0	90.7	61.9	123				J
2,6-Dinitrotoluene	1,800	40.0	2,000	0	89.9	64.6	123				
Acenaphthylene	1,820	30.0	2,000	0	91.2	61.9	112				
2,4-Dinitrophenol	1,720	300	4,000	0	43.1	5	132				
Dibenzofuran	1,750	30.0	2,000	0	87.7	60.2	116				
2,4-Dinitrotoluene	1,770	60.0	2,000	0	88.3	63.4	124				
4-Nitrophenol	1,410	200	2,000	0	70.3	8.76	130				
Fluorene	1,730	30.0	2,000	0	86.7	62.4	115				
4-Chlorophenyl phenyl ether	1,780	30.0	2,000	0	89.2	58.8	121				
Diethylphthalate	1,700	750	2,000	0	85.0	61.9	111				
4,6-Dinitro-2-methylphenol	1,360	250	2,000	0	68.1	5	134				
4-Bromophenyl phenyl ether	1,860	30.0	2,000	0	92.9	59.1	118				
Hexachlorobenzene	1,820	30.0	2,000	0	91.1	60.4	119				
Pentachlorophenol	1,430	200	2,000	0	71.6	26.5	130				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38692</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>			Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>					
Client ID: <b>LCSS</b>	Batch ID: <b>38692</b>				Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666479</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenanthrene	1,770	30.0	2,000	0	88.3	57.9	116				
Anthracene	1,750	30.0	2,000	0	87.7	56.1	118				
Carbazole	1,750	30.0	2,000	0	87.7	48.9	128				
Di-n-butylphthalate	1,810	30.0	2,000	0	90.5	58.9	123				
Fluoranthene	1,800	30.0	2,000	0	89.8	54.7	126				
Pyrene	1,800	150	2,000	0	90.1	53.5	126				
Butyl Benzylphthalate	1,810	50.0	2,000	0	90.4	54.4	131				
bis(2-Ethylhexyl)adipate	1,780	200	2,000	0	89.0	51	133				
Benz(a)anthracene	1,880	30.0	2,000	0	94.0	40.1	140				
Chrysene	1,770	50.0	2,000	0	88.4	59.7	116				
bis (2-Ethylhexyl) phthalate	1,750	40.0	2,000	0	87.7	51.2	137				
Di-n-octyl phthalate	1,700	75.0	2,000	0	85.2	48.1	152				
Benzo(b)fluoranthene	1,830	100	2,000	0	91.7	57.9	122				
Benzo(k)fluoranthene	1,920	30.0	2,000	0	95.8	49	124				
Benzo(a)pyrene	1,860	40.0	2,000	0	93.1	53	108				
Indeno(1,2,3-cd)pyrene	1,890	200	2,000	0	94.7	56	124				
Dibenz(a,h)anthracene	1,920	100	2,000	0	96.0	55.8	125				
Benzo(g,h,i)perylene	1,830	100	2,000	0	91.5	61.3	112				
Surr: 2,4,6-Tribromophenol	1,900		2,000		95.0	16.2	150				
Surr: 2-Fluorobiphenyl	896		1,000		89.6	25.3	139				
Surr: Nitrobenzene-d5	861		1,000		86.1	12.7	143				
Surr: Phenol-d6	1,530		2,000		76.7	21.4	139				
Surr: p-Terphenyl	911		1,000		91.1	37.1	144				

Sample ID: <b>2211535-006AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>			Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>					
Client ID: <b>BATCH</b>	Batch ID: <b>38692</b>				Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666481</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	2,060	40.5	2,698	0	76.2	31.6	121				
Bis(2-chloroethyl) ether	1,850	67.4	2,698	0	68.6	26.1	123				
2-Chlorophenol	1,940	54.0	2,698	0	71.8	26.8	122				



Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211535-006AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>
Client ID: <b>BATCH</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666481</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,3-Dichlorobenzene	1,900	54.0	2,698	0	70.3	13	122				
1,4-Dichlorobenzene	1,890	40.5	2,698	0	70.2	14.1	122				
1,2-Dichlorobenzene	1,930	54.0	2,698	0	71.6	18.6	122				
Benzyl alcohol	332	202	2,698	0	12.3	5	142				
2-Methylphenol (o-cresol)	1,790	54.0	2,698	0	66.2	36.5	121				
Hexachloroethane	2,950	54.0	2,698	0	109	9.86	123				
N-Nitrosodi-n-propylamine	2,210	108	2,698	0	82.0	29.5	128				
3&4-Methylphenol (m, p-cresol)	1,900	40.5	2,698	0	70.6	30.6	127				
Nitrobenzene	2,000	67.4	2,698	0	74.1	30.8	123				
Isophorone	2,520	54.0	2,698	1,020	55.7	30.8	128				
2-Nitrophenol	2,200	40.5	2,698	0	81.4	30.3	126				
2,4-Dimethylphenol	1,990	40.5	2,698	0	73.8	32.2	120				
Bis(2-chloroethoxy)methane	2,040	40.5	2,698	0	75.8	34.3	120				
2,4-Dichlorophenol	1,890	40.5	2,698	0	70.2	33.7	123				
1,2,4-Trichlorobenzene	1,920	40.5	2,698	0	71.3	33.7	116				
Naphthalene	2,270	54.0	2,698	221.4	76.0	33.3	119				
4-Chloroaniline	1,770	40.5	2,698	0	65.5	10.2	120				
Hexachlorobutadiene	2,040	40.5	2,698	0	75.5	32.2	118				
4-Chloro-3-methylphenol	1,810	40.5	2,698	0	67.0	35.4	133				
2-Methylnaphthalene	2,250	40.5	2,698	416.8	67.9	39.4	117				
1-Methylnaphthalene	2,420	40.5	2,698	0	89.8	37.1	121				
Hexachlorocyclopentadiene	2,150	135	2,698	0	79.7	5	134				
2,4,6-Trichlorophenol	2,000	40.5	2,698	0	74.2	37.2	129				
2,4,5-Trichlorophenol	1,800	40.5	2,698	0	66.7	37.1	124				
2-Chloronaphthalene	1,990	40.5	2,698	0	74.0	40.8	117				
2-Nitroaniline	1,880	67.4	2,698	0	69.6	40.4	131				
Acenaphthene	2,160	40.5	2,698	325.1	68.0	34.1	119				
Dimethylphthalate	2110	4,720	2,698	0	78.3	37	126				
2,6-Dinitrotoluene	2,060	54.0	2,698	0	76.2	43.4	123				
Acenaphthylene	2,080	40.5	2,698	0	77.0	38.5	115				
2,4-Dinitrophenol	3,030	405	5,395	0	56.2	5	127				
Dibenzofuran	2,010	40.5	2,698	0	74.3	39	119				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2211535-006AMS	SampType: MS	Units: µg/Kg-dry	Prep Date: 12/2/2022	RunNo: 80598							
Client ID: BATCH	Batch ID: 38692	Analysis Date: 12/13/2022	SeqNo: 1666481								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrotoluene	2,200	80.9	2,698	0	81.5	40.1	127				
4-Nitrophenol	1,530	270	2,698	0	56.7	7.49	136				
Fluorene	2,190	40.5	2,698	0	81.0	34.2	124				
4-Chlorophenyl phenyl ether	2,090	40.5	2,698	0	77.6	38.8	124				
Diethylphthalate	2,070	1,010	2,698	0	76.8	40.1	122				
4,6-Dinitro-2-methylphenol	2,170	337	2,698	0	80.6	5	142				
4-Bromophenyl phenyl ether	2,400	40.5	2,698	0	89.1	38.5	124				
Hexachlorobenzene	2,170	40.5	2,698	0	80.4	40.4	122				
Pentachlorophenol	1,960	270	2,698	0	72.8	16.6	148				
Phenanthrene	2,320	40.5	2,698	634.8	62.4	29.1	128				
Anthracene	2,220	40.5	2,698	0	82.4	32.5	124				
Carbazole	2,070	40.5	2,698	0	76.7	33.5	126				
Di-n-butylphthalate	2,180	40.5	2,698	0	80.9	38.3	134				
Fluoranthene	2,090	40.5	2,698	0	77.4	30	132				
Pyrene	2,280	202	2,698	339.2	71.9	30.9	130				
Butyl Benzylphthalate	2,320	67.4	2,698	0	85.9	35	147				
bis(2-Ethylhexyl)adipate	2,270	270	2,698	0	84.2	34.2	149				
Benz(a)anthracene	2,220	40.5	2,698	0	82.4	25	134				
Chrysene	2,040	67.4	2,698	0	75.7	28.6	125				
bis (2-Ethylhexyl) phthalate	2,180	54.0	2,698	0	80.7	22.9	158				
Di-n-octyl phthalate	2,260	101	2,698	0	83.7	36.9	157				
Benzo(b)fluoranthene	2,180	135	2,698	0	81.0	21.4	140				
Benzo(k)fluoranthene	2,350	40.5	2,698	0	87.0	20.2	139				
Benzo(a)pyrene	2,320	54.0	2,698	0	86.0	17.6	149				
Indeno(1,2,3-cd)pyrene	2,280	270	2,698	0	84.6	22.7	139				
Dibenz(a,h)anthracene	2,370	135	2,698	0	87.9	23.7	145				
Benzo(g,h,i)perylene	2,020	135	2,698	0	74.7	18.6	134				
Surr: 2,4,6-Tribromophenol	2,230		2,698		82.8	16.2	150				
Surr: 2-Fluorobiphenyl	1,020		1,349		75.5	25.3	139				
Surr: Nitrobenzene-d5	1,620		1,349		120	12.7	143				
Surr: Phenol-d6	1,620		2,698		60.2	21.4	139				
Surr: p-Terphenyl	1,110		1,349		82.1	37.1	144				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211535-006AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666481</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: <b>2211535-006AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/2/2022</b>	RunNo: <b>80598</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38692</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1666482</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,560	40.7	2,713	0	57.6	31.6	121	2,057	27.2	50	
Bis(2-chloroethyl) ether	1,980	67.8	2,713	0	73.1	26.1	123	1,850	7.02	50	
2-Chlorophenol	2,060	54.3	2,713	0	75.9	26.8	122	1,936	6.11	50	
1,3-Dichlorobenzene	2,120	54.3	2,713	0	78.1	13	122	1,895	11.2	50	
1,4-Dichlorobenzene	2,060	40.7	2,713	0	75.9	14.1	122	1,893	8.39	50	
1,2-Dichlorobenzene	2,090	54.3	2,713	0	77.0	18.6	122	1,930	7.85	50	
Benzyl alcohol	355	203	2,713	0	13.1	5	142	332.2	6.78	50	
2-Methylphenol (o-cresol)	1,920	54.3	2,713	0	70.6	36.5	121	1,786	7.06	50	
Hexachloroethane	3,140	54.3	2,713	0	116	9.86	123	2,946	6.46	50	
N-Nitrosodi-n-propylamine	2,310	109	2,713	0	85.3	29.5	128	2,211	4.59	50	
3&4-Methylphenol (m, p-cresol)	2,300	40.7	2,713	0	84.6	30.6	127	1,904	18.7	50	
Nitrobenzene	2,060	67.8	2,713	0	76.0	30.8	123	1,999	3.13	50	
Isophorone	2,650	54.3	2,713	1,020	60.2	30.8	128	2,523	5.03	50	
2-Nitrophenol	2,360	40.7	2,713	0	86.9	30.3	126	2,197	7.07	50	
2,4-Dimethylphenol	2,250	40.7	2,713	0	82.9	32.2	120	1,991	12.1	50	
Bis(2-chloroethoxy)methane	2,130	40.7	2,713	0	78.7	34.3	120	2,044	4.33	50	
2,4-Dichlorophenol	2,020	40.7	2,713	0	74.4	33.7	123	1,893	6.39	50	
1,2,4-Trichlorobenzene	2,110	40.7	2,713	0	77.7	33.7	116	1,922	9.17	50	
Naphthalene	2,470	54.3	2,713	221.4	83.0	33.3	119	2,272	8.46	50	
4-Chloroaniline	1,850	40.7	2,713	0	68.3	10.2	120	1,767	4.72	50	
Hexachlorobutadiene	2,210	40.7	2,713	0	81.3	32.2	118	2,037	7.91	50	
4-Chloro-3-methylphenol	1,760	40.7	2,713	0	65.0	35.4	133	1,807	2.38	50	
2-Methylnaphthalene	2,410	40.7	2,713	416.8	73.5	39.4	117	2,247	6.99	50	
1-Methylnaphthalene	2,610	40.7	2,713	0	96.2	37.1	121	2,423	7.41	50	
Hexachlorocyclopentadiene	2,320	136	2,713	0	85.6	5	134	2,150	7.71	50	
2,4,6-Trichlorophenol	2,130	40.7	2,713	0	78.5	37.2	129	2,001	6.25	50	

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2211535-006AMSD	SampType: MSD	Units: µg/Kg-dry				Prep Date: 12/2/2022	RunNo: 80598				
Client ID: BATCH	Batch ID: 38692					Analysis Date: 12/13/2022	SeqNo: 1666482				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4,5-Trichlorophenol	1,970	40.7	2,713	0	72.4	37.1	124	1,800	8.74	50	
2-Chloronaphthalene	2,100	40.7	2,713	0	77.4	40.8	117	1,995	5.12	50	
2-Nitroaniline	2,030	67.8	2,713	0	74.9	40.4	131	1,876	7.92	50	
Acenaphthene	2,310	40.7	2,713	325.1	73.1	34.1	119	2,160	6.62	50	
Dimethylphthalate	2240	4,750	2,713	0	82.4	37	126	2,113	5.70	50	
2,6-Dinitrotoluene	2,190	54.3	2,713	0	80.9	43.4	123	2,056	6.55	50	
Acenaphthylene	2,220	40.7	2,713	0	81.7	38.5	115	2,076	6.53	50	
2,4-Dinitrophenol	3,280	407	5,426	0	60.4	5	127	3,030	7.91	50	
Dibenzofuran	2,160	40.7	2,713	0	79.5	39	119	2,005	7.33	50	
2,4-Dinitrotoluene	2,380	81.4	2,713	0	87.8	40.1	127	2,198	8.06	50	
4-Nitrophenol	1,770	271	2,713	0	65.1	7.49	136	1,530	14.3	50	
Fluorene	2,330	40.7	2,713	0	86.0	34.2	124	2,185	6.55	50	
4-Chlorophenyl phenyl ether	2,220	40.7	2,713	0	81.7	38.8	124	2,093	5.71	50	
Diethylphthalate	2,160	1,020	2,713	0	79.7	40.1	122	2,071	4.27	50	
4,6-Dinitro-2-methylphenol	2,240	339	2,713	0	82.7	5	142	2,174	3.17	50	
4-Bromophenyl phenyl ether	2,440	40.7	2,713	0	90.0	38.5	124	2,402	1.67	50	
Hexachlorobenzene	2,270	40.7	2,713	0	83.5	40.4	122	2,168	4.37	50	
Pentachlorophenol	2,130	271	2,713	0	78.6	16.6	148	1,963	8.29	50	
Phenanthrene	2,420	40.7	2,713	634.8	65.8	29.1	128	2,319	4.28	50	
Anthracene	2,300	40.7	2,713	0	84.6	32.5	124	2,222	3.28	50	
Carbazole	2,150	40.7	2,713	0	79.1	33.5	126	2,070	3.66	50	
Di-n-butylphthalate	2,330	40.7	2,713	0	85.9	38.3	134	2,182	6.54	50	
Fluoranthene	2,200	40.7	2,713	0	81.2	30	132	2,089	5.35	50	
Pyrene	2,410	203	2,713	339.2	76.4	30.9	130	2,278	5.67	50	
Butyl Benzylphthalate	2,430	67.8	2,713	0	89.6	35	147	2,316	4.89	50	
bis(2-Ethylhexyl)adipate	2,400	271	2,713	0	88.4	34.2	149	2,272	5.40	50	
Benz(a)anthracene	2,310	40.7	2,713	0	85.2	25	134	2,223	3.92	50	
Chrysene	2,120	67.8	2,713	0	78.0	28.6	125	2,043	3.55	50	
bis (2-Ethylhexyl) phthalate	2,340	54.3	2,713	0	86.1	22.9	158	2,178	6.96	50	
Di-n-octyl phthalate	2,400	102	2,713	0	88.6	36.9	157	2,259	6.18	50	
Benzo(b)fluoranthene	2,370	136	2,713	0	87.3	21.4	140	2,184	8.08	50	
Benzo(k)fluoranthene	2,430	40.7	2,713	0	89.5	20.2	139	2,346	3.41	50	

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2211535-006AMSD		SampType: MSD		Units: µg/Kg-dry		Prep Date: 12/2/2022		RunNo: 80598			
Client ID: BATCH		Batch ID: 38692				Analysis Date: 12/13/2022		SeqNo: 1666482			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(a)pyrene	2,400	54.3	2,713	0	88.4	17.6	149	2,321	3.29	50	
Indeno(1,2,3-cd)pyrene	2,360	271	2,713	0	87.0	22.7	139	2,282	3.43	50	
Dibenz(a,h)anthracene	2,460	136	2,713	0	90.8	23.7	145	2,372	3.76	50	
Benzo(g,h,i)perylene	2,160	136	2,713	0	79.5	18.6	134	2,016	6.78	50	
Surr: 2,4,6-Tribromophenol	2,430		2,713		89.5	16.2	150		0		
Surr: 2-Fluorobiphenyl	1,130		1,357		83.3	25.3	139		0		
Surr: Nitrobenzene-d5	1,730		1,357		128	12.7	143		0		
Surr: Phenol-d6	1,810		2,713		66.6	21.4	139		0		
Surr: p-Terphenyl	1,180		1,357		86.6	37.1	144		0		

Sample ID: MB-38724		SampType: MBLK		Units: µg/Kg		Prep Date: 12/5/2022		RunNo: 80657			
Client ID: MBLKS		Batch ID: 38724				Analysis Date: 12/14/2022		SeqNo: 1668260			
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	ND	30.0									
Bis(2-chloroethyl) ether	ND	50.0									
2-Chlorophenol	ND	40.0									
1,3-Dichlorobenzene	ND	40.0									
1,4-Dichlorobenzene	ND	30.0									
1,2-Dichlorobenzene	ND	40.0									
Benzyl alcohol	ND	150									Q
2-Methylphenol (o-cresol)	ND	40.0									
Hexachloroethane	ND	40.0									
N-Nitrosodi-n-propylamine	ND	80.0									
3&4-Methylphenol (m, p-cresol)	ND	30.0									Q
Nitrobenzene	ND	50.0									
Isophorone	ND	40.0									
2-Nitrophenol	ND	30.0									
2,4-Dimethylphenol	ND	30.0									
Bis(2-chloroethoxy)methane	ND	30.0									
2,4-Dichlorophenol	ND	30.0									

**Work Order:** 2211603  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38724</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668260</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

1,2,4-Trichlorobenzene	ND	30.0									
Naphthalene	ND	40.0									
4-Chloroaniline	ND	30.0									
Hexachlorobutadiene	ND	30.0									
4-Chloro-3-methylphenol	ND	30.0									Q
2-Methylnaphthalene	ND	30.0									
1-Methylnaphthalene	ND	30.0									
Hexachlorocyclopentadiene	ND	100									
2,4,6-Trichlorophenol	ND	30.0									
2,4,5-Trichlorophenol	ND	30.0									
2-Chloronaphthalene	ND	30.0									
2-Nitroaniline	ND	50.0									
Acenaphthene	ND	30.0									
Dimethylphthalate	ND	3,500									
2,6-Dinitrotoluene	ND	40.0									
Acenaphthylene	ND	30.0									
2,4-Dinitrophenol	ND	300									
Dibenzofuran	ND	30.0									
2,4-Dinitrotoluene	ND	60.0									
4-Nitrophenol	ND	200									Q
Fluorene	ND	30.0									
4-Chlorophenyl phenyl ether	ND	30.0									
Diethylphthalate	ND	750									
4,6-Dinitro-2-methylphenol	ND	250									
4-Bromophenyl phenyl ether	ND	30.0									
Hexachlorobenzene	ND	30.0									
Pentachlorophenol	ND	200									
Phenanthrene	ND	30.0									
Anthracene	ND	30.0									
Carbazole	ND	30.0									
Di-n-butylphthalate	ND	30.0									
Fluoranthene	ND	30.0									



Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38724</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668260</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Pyrene	ND	150									
Butyl Benzylphthalate	ND	50.0									
bis(2-Ethylhexyl)adipate	ND	200									
Benz(a)anthracene	ND	30.0									
Chrysene	ND	50.0									
bis (2-Ethylhexyl) phthalate	ND	40.0									
Di-n-octyl phthalate	ND	75.0									
Benzo(b)fluoranthene	ND	100									
Benzo(k)fluoranthene	ND	30.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	200									
Dibenz(a,h)anthracene	ND	100									
Benzo(g,h,i)perylene	ND	100									*
Surr: 2,4,6-Tribromophenol	1,530		2,000		76.7	16.2	150				
Surr: 2-Fluorobiphenyl	862		1,000		86.2	25.3	139				
Surr: Nitrobenzene-d5	767		1,000		76.7	12.7	143				
Surr: Phenol-d6	1,470		2,000		73.6	21.4	139				
Surr: p-Terphenyl	847		1,000		84.7	37.1	144				

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724A). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

Sample ID: <b>LCS-38724</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668261</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,480	30.0	2,000	0	73.9	54	114				
Bis(2-chloroethyl) ether	1,600	50.0	2,000	0	80.0	60.2	120				
2-Chlorophenol	1,670	40.0	2,000	0	83.4	63.8	111				
1,3-Dichlorobenzene	1,630	40.0	2,000	0	81.4	64.5	110				
1,4-Dichlorobenzene	1,640	30.0	2,000	0	82.2	64.3	112				
1,2-Dichlorobenzene	1,640	40.0	2,000	0	82.0	64.2	112				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38724</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668261</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Benzyl alcohol	334	150	2,000	0	16.7	5	159				
2-Methylphenol (o-cresol)	1,550	40.0	2,000	0	77.4	51.8	116				
Hexachloroethane	1,540	40.0	2,000	0	77.1	62.1	114				
N-Nitrosodi-n-propylamine	1,640	80.0	2,000	0	81.9	59.1	123				
3&4-Methylphenol (m, p-cresol)	1,530	30.0	2,000	0	76.5	55.3	120				
Nitrobenzene	1,630	50.0	2,000	0	81.6	63.1	119				
Isophorone	1,650	40.0	2,000	0	82.5	63.7	120				
2-Nitrophenol	1,790	30.0	2,000	0	89.5	66.4	116				
2,4-Dimethylphenol	1,610	30.0	2,000	0	80.4	55.5	112				
Bis(2-chloroethoxy)methane	1,640	30.0	2,000	0	82.2	64.6	112				
2,4-Dichlorophenol	1,640	30.0	2,000	0	81.8	57.1	116				
1,2,4-Trichlorobenzene	1,700	30.0	2,000	0	85.0	64.7	110				
Naphthalene	1,720	40.0	2,000	0	86.2	64.7	110				
4-Chloroaniline	1,470	30.0	2,000	0	73.6	64.6	112				
Hexachlorobutadiene	1,720	30.0	2,000	0	86.1	64.7	116				
4-Chloro-3-methylphenol	1,370	30.0	2,000	0	68.5	50.9	128				
2-Methylnaphthalene	1,680	30.0	2,000	0	84.1	63.6	119				
1-Methylnaphthalene	1,700	30.0	2,000	0	85.0	64.1	114				
Hexachlorocyclopentadiene	804	100	2,000	0	40.2	34.7	141				
2,4,6-Trichlorophenol	1,700	30.0	2,000	0	85.0	60.9	123				
2,4,5-Trichlorophenol	1,700	30.0	2,000	0	84.9	48.7	128				
2-Chloronaphthalene	1,700	30.0	2,000	0	85.0	65.4	114				
2-Nitroaniline	1,710	50.0	2,000	0	85.5	62.3	127				
Acenaphthene	1,700	30.0	2,000	0	85.2	63.3	118				
Dimethylphthalate	1,730	1,620	2,000	0	86.7	61.9	123				
2,6-Dinitrotoluene	1,770	40.0	2,000	0	88.6	64.6	123				
Acenaphthylene	1,720	30.0	2,000	0	86.0	61.9	112				
2,4-Dinitrophenol	2,870	300	4,000	0	71.7	5	132				
Dibenzofuran	1,670	30.0	2,000	0	83.3	60.2	116				
2,4-Dinitrotoluene	1,700	60.0	2,000	0	84.8	63.4	124				
4-Nitrophenol	1,430	200	2,000	0	71.7	8.76	130				
Fluorene	1,660	30.0	2,000	0	83.0	62.4	115				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: LCS-38724	SampType: LCS	Units: µg/Kg				Prep Date: 12/5/2022	RunNo: 80657				
Client ID: LCSS	Batch ID: 38724					Analysis Date: 12/14/2022	SeqNo: 1668261				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4-Chlorophenyl phenyl ether	1,720	30.0	2,000	0	86.1	58.8	121				
Diethylphthalate	1,630	750	2,000	0	81.4	61.9	111				
4,6-Dinitro-2-methylphenol	1,790	250	2,000	0	89.7	5	134				
4-Bromophenyl phenyl ether	1,770	30.0	2,000	0	88.3	59.1	118				
Hexachlorobenzene	1,750	30.0	2,000	0	87.3	60.4	119				
Pentachlorophenol	1,400	200	2,000	0	70.0	26.5	130				
Phenanthrene	1,680	30.0	2,000	0	83.9	57.9	116				
Anthracene	1,670	30.0	2,000	0	83.4	56.1	118				
Carbazole	1,720	30.0	2,000	0	85.9	48.9	128				
Di-n-butylphthalate	1,730	30.0	2,000	0	86.4	58.9	123				
Fluoranthene	1,730	30.0	2,000	0	86.5	54.7	126				
Pyrene	1,720	150	2,000	0	86.1	53.5	126				
Butyl Benzylphthalate	1,750	50.0	2,000	0	87.5	54.4	131				
bis(2-Ethylhexyl)adipate	1,740	200	2,000	0	87.2	51	133				
Benz(a)anthracene	1,820	30.0	2,000	0	91.0	40.1	140				
Chrysene	1,630	50.0	2,000	0	81.6	59.7	116				
bis (2-Ethylhexyl) phthalate	1,640	40.0	2,000	0	82.0	51.2	137				
Di-n-octyl phthalate	1,660	75.0	2,000	0	82.8	48.1	152				
Benzo(b)fluoranthene	1,600	100	2,000	0	80.0	57.9	122				
Benzo(k)fluoranthene	1,670	30.0	2,000	0	83.3	49	124				
Benzo(a)pyrene	1,570	40.0	2,000	0	78.5	53	108				
Indeno(1,2,3-cd)pyrene	1,380	200	2,000	0	69.2	56	124				
Dibenz(a,h)anthracene	1,550	100	2,000	0	77.6	55.8	125				
Benzo(g,h,i)perylene	1,200	100	2,000	0	59.9	61.3	112				S
Surr: 2,4,6-Tribromophenol	1,820		2,000		90.8	16.2	150				
Surr: 2-Fluorobiphenyl	883		1,000		88.3	25.3	139				
Surr: Nitrobenzene-d5	833		1,000		83.3	12.7	143				
Surr: Phenol-d6	1,530		2,000		76.3	21.4	139				
Surr: p-Terphenyl	900		1,000		90.0	37.1	144				

**NOTES:**

S - Outlying spike recovery observed (low bias). Samples will be qualified with a \*.

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>			Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	832	30.0	1,000	0	83.2	80	120				
Bis(2-chloroethyl) ether	871	50.0	1,000	0	87.1	80	120				
2-Chlorophenol	905	40.0	1,000	0	90.5	80	120				
1,3-Dichlorobenzene	906	40.0	1,000	0	90.6	80	120				
1,4-Dichlorobenzene	919	30.0	1,000	0	91.9	80	120				
1,2-Dichlorobenzene	931	40.0	1,000	0	93.1	80	120				
Benzyl alcohol	212	150	1,000	0	21.2	80	120				S
2-Methylphenol (o-cresol)	844	40.0	1,000	0	84.4	80	120				
Hexachloroethane	858	40.0	1,000	0	85.8	80	120				
N-Nitrosodi-n-propylamine	867	80.0	1,000	0	86.7	80	120				
3&4-Methylphenol (m, p-cresol)	830	30.0	1,000	0	83.0	80	120				
Nitrobenzene	883	50.0	1,000	0	88.3	80	120				
Isophorone	863	40.0	1,000	0	86.3	80	120				
2-Nitrophenol	986	30.0	1,000	0	98.6	80	120				
2,4-Dimethylphenol	869	30.0	1,000	0	86.9	80	120				
Bis(2-chloroethoxy)methane	896	30.0	1,000	0	89.6	80	120				
2,4-Dichlorophenol	863	30.0	1,000	0	86.3	80	120				
1,2,4-Trichlorobenzene	943	30.0	1,000	0	94.3	80	120				
Naphthalene	919	40.0	1,000	0	91.9	80	120				
4-Chloroaniline	809	30.0	1,000	0	80.9	80	120				
Hexachlorobutadiene	930	30.0	1,000	0	93.0	80	120				
4-Chloro-3-methylphenol	765	30.0	1,000	0	76.5	80	120				S
2-Methylnaphthalene	905	30.0	1,000	0	90.5	80	120				
1-Methylnaphthalene	906	30.0	1,000	0	90.6	80	120				
Hexachlorocyclopentadiene	408	100	1,000	0	40.8	80	120				S
2,4,6-Trichlorophenol	879	30.0	1,000	0	87.9	80	120				
2,4,5-Trichlorophenol	850	30.0	1,000	0	85.0	80	120				
2-Chloronaphthalene	907	30.0	1,000	0	90.7	80	120				
2-Nitroaniline	832	50.0	1,000	0	83.2	80	120				
Acenaphthene	920	30.0	1,000	0	92.0	80	120				
Dimethylphthalate	895	800	1,000	0	89.5	80	120				
2,6-Dinitrotoluene	908	40.0	1,000	0	90.8	80	120				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>				Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>				
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>					Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Acenaphthylene	893	30.0	1,000	0	89.3	80	120				
2,4-Dinitrophenol	1,440	300	2,000	0	72.0	80	120				S
Dibenzofuran	873	30.0	1,000	0	87.3	80	120				
2,4-Dinitrotoluene	858	60.0	1,000	0	85.8	80	120				
4-Nitrophenol	618	200	1,000	0	61.8	80	120				S
Fluorene	888	30.0	1,000	0	88.8	80	120				
4-Chlorophenyl phenyl ether	915	30.0	1,000	0	91.5	80	120				
Diethylphthalate	828	750	1,000	0	82.8	80	120				
4,6-Dinitro-2-methylphenol	816	250	1,000	0	81.6	80	120				
4-Bromophenyl phenyl ether	895	30.0	1,000	0	89.5	80	120				
Hexachlorobenzene	932	30.0	1,000	0	93.2	80	120				
Pentachlorophenol	766	200	1,000	0	76.6	80	120				S
Phenanthrene	901	30.0	1,000	0	90.1	80	120				
Anthracene	883	30.0	1,000	0	88.3	80	120				
Carbazole	822	30.0	1,000	0	82.2	80	120				
Di-n-butylphthalate	847	30.0	1,000	0	84.7	80	120				
Fluoranthene	893	30.0	1,000	0	89.3	80	120				
Pyrene	876	150	1,000	0	87.6	80	120				
Butyl Benzylphthalate	867	50.0	1,000	0	86.7	80	120				
bis(2-Ethylhexyl)adipate	813	200	1,000	0	81.3	80	120				
Benz(a)anthracene	914	30.0	1,000	0	91.4	80	120				
Chrysene	885	50.0	1,000	0	88.5	80	120				
bis (2-Ethylhexyl) phthalate	790	40.0	1,000	0	79.0	80	120				S
Di-n-octyl phthalate	808	75.0	1,000	0	80.8	80	120				
Benzo(b)fluoranthene	848	100	1,000	0	84.8	80	120				
Benzo(k)fluoranthene	908	30.0	1,000	0	90.8	80	120				
Benzo(a)pyrene	813	40.0	1,000	0	81.3	80	120				
Indeno(1,2,3-cd)pyrene	788	200	1,000	0	78.8	80	120				S
Dibenz(a,h)anthracene	836	100	1,000	0	83.6	80	120				
Benzo(g,h,i)perylene	651	100	1,000	0	65.1	80	120				S
Surr: 2,4,6-Tribromophenol	890		1,000		89.0	65.9	141				
Surr: 2-Fluorobiphenyl	473		500.0		94.7	73.1	130				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Nitrobenzene-d5	443		500.0		88.6	77.9	122				
Surr: Phenol-d6	827		1,000		82.7	78.9	117				
Surr: p-Terphenyl	459		500.0		91.8	71.7	131				

**NOTES:**  
 S - Outlying spike recovery observed (low bias). Samples will be qualified with a Q.

Sample ID: <b>2211617-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668276</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,290	35.9	2,390	0	53.9	31.6	121				
Bis(2-chloroethyl) ether	1,360	59.8	2,390	0	56.8	26.1	123				
2-Chlorophenol	1,420	47.8	2,390	0	59.4	26.8	122				
1,3-Dichlorobenzene	1,330	47.8	2,390	0	55.6	13	122				
1,4-Dichlorobenzene	1,320	35.9	2,390	0	55.1	14.1	122				
1,2-Dichlorobenzene	1,350	47.8	2,390	0	56.5	18.6	122				
Benzyl alcohol	203	179	2,390	0	8.48	5	142				
2-Methylphenol (o-cresol)	1,280	47.8	2,390	0	53.7	36.5	121				
Hexachloroethane	1,120	47.8	2,390	0	46.8	9.86	123				
N-Nitrosodi-n-propylamine	1,370	95.6	2,390	0	57.3	29.5	128				
3&4-Methylphenol (m, p-cresol)	1,330	35.9	2,390	0	55.8	30.6	127				
Nitrobenzene	1,390	59.8	2,390	0	58.3	30.8	123				
Isophorone	1,420	47.8	2,390	0	59.6	30.8	128				
2-Nitrophenol	1,490	35.9	2,390	0	62.2	30.3	126				
2,4-Dimethylphenol	1,410	35.9	2,390	0	58.8	32.2	120				
Bis(2-chloroethoxy)methane	1,440	35.9	2,390	0	60.1	34.3	120				
2,4-Dichlorophenol	1,460	35.9	2,390	0	61.3	33.7	123				
1,2,4-Trichlorobenzene	1,430	35.9	2,390	0	59.8	33.7	116				
Naphthalene	1,470	47.8	2,390	0	61.4	33.3	119				
4-Chloroaniline	1,150	35.9	2,390	0	48.0	10.2	120				
Hexachlorobutadiene	1,490	35.9	2,390	0	62.1	32.2	118				
4-Chloro-3-methylphenol	1,190	35.9	2,390	0	49.7	35.4	133				



Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668276</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Methylnaphthalene	1,440	35.9	2,390	0	60.4	39.4	117				
1-Methylnaphthalene	1,450	35.9	2,390	0	60.8	37.1	121				
Hexachlorocyclopentadiene	320	120	2,390	0	13.4	5	134				
2,4,6-Trichlorophenol	1,480	35.9	2,390	0	61.7	37.2	129				
2,4,5-Trichlorophenol	1,490	35.9	2,390	0	62.5	37.1	124				
2-Chloronaphthalene	1,470	35.9	2,390	0	61.7	40.8	117				
2-Nitroaniline	1,470	59.8	2,390	0	61.5	40.4	131				
Acenaphthene	1,470	35.9	2,390	0	61.6	34.1	119				
Dimethylphthalate	1490	1,670	2,390	0	62.4	37	126				
2,6-Dinitrotoluene	1,520	47.8	2,390	0	63.6	43.4	123				
Acenaphthylene	1,510	35.9	2,390	0	63.0	38.5	115				
2,4-Dinitrophenol	1,960	359	4,781	0	41.1	5	127				
Dibenzofuran	1,450	35.9	2,390	0	60.8	39	119				
2,4-Dinitrotoluene	1,420	71.7	2,390	0	59.5	40.1	127				
4-Nitrophenol	1,130	239	2,390	0	47.4	7.49	136				
Fluorene	1,430	35.9	2,390	0	60.0	34.2	124				
4-Chlorophenyl phenyl ether	1,520	35.9	2,390	0	63.5	38.8	124				
Diethylphthalate	1,370	896	2,390	0	57.2	40.1	122				
4,6-Dinitro-2-methylphenol	1,440	299	2,390	0	60.4	5	142				
4-Bromophenyl phenyl ether	1,530	35.9	2,390	0	64.0	38.5	124				
Hexachlorobenzene	1,500	35.9	2,390	0	62.9	40.4	122				
Pentachlorophenol	1,320	239	2,390	0	55.3	16.6	148				
Phenanthrene	1,460	35.9	2,390	0	61.0	29.1	128				
Anthracene	1,450	35.9	2,390	0	60.5	32.5	124				
Carbazole	1,420	35.9	2,390	0	59.4	33.5	126				
Di-n-butylphthalate	1,440	35.9	2,390	0	60.3	38.3	134				
Fluoranthene	1,480	35.9	2,390	0	61.9	30	132				
Pyrene	1,490	179	2,390	0	62.2	30.9	130				
Butyl Benzylphthalate	1,460	59.8	2,390	0	61.0	35	147				
bis(2-Ethylhexyl)adipate	1,400	239	2,390	0	58.7	34.2	149				
Benz(a)anthracene	1,510	35.9	2,390	0	63.3	25	134				
Chrysene	1,400	59.8	2,390	0	58.7	28.6	125				

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2211617-001AMS	SampType: MS	Units: µg/Kg-dry			Prep Date: 12/5/2022	RunNo: 80657					
Client ID: BATCH	Batch ID: 38724				Analysis Date: 12/14/2022	SeqNo: 1668276					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
bis (2-Ethylhexyl) phthalate	1,400	47.8	2,390	0	58.6	22.9	158				
Di-n-octyl phthalate	1,390	89.6	2,390	0	58.1	36.9	157				
Benzo(b)fluoranthene	1,220	120	2,390	0	51.2	21.4	140				
Benzo(k)fluoranthene	1,350	35.9	2,390	0	56.3	20.2	139				
Benzo(a)pyrene	1,130	47.8	2,390	0	47.1	17.6	149				
Indeno(1,2,3-cd)pyrene	974	239	2,390	0	40.7	22.7	139				
Dibenz(a,h)anthracene	1,270	120	2,390	0	53.0	23.7	145				
Benzo(g,h,i)perylene	802	120	2,390	0	33.5	18.6	134				
Surr: 2,4,6-Tribromophenol	1,600		2,390		67.0	16.2	150				
Surr: 2-Fluorobiphenyl	778		1,195		65.1	25.3	139				
Surr: Nitrobenzene-d5	723		1,195		60.5	12.7	143				
Surr: Phenol-d6	1,390		2,390		58.2	21.4	139				
Surr: p-Terphenyl	801		1,195		67.0	37.1	144				

Sample ID: 2211617-001AMSD	SampType: MSD	Units: µg/Kg-dry			Prep Date: 12/5/2022	RunNo: 80657					
Client ID: BATCH	Batch ID: 38724				Analysis Date: 12/14/2022	SeqNo: 1668277					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,370	35.4	2,360	0	57.9	31.6	121	1,288	5.85	50	
Bis(2-chloroethyl) ether	1,420	59.0	2,360	0	60.0	26.1	123	1,358	4.12	50	
2-Chlorophenol	1,490	47.2	2,360	0	63.3	26.8	122	1,419	5.08	50	
1,3-Dichlorobenzene	1,390	47.2	2,360	0	58.9	13	122	1,330	4.38	50	
1,4-Dichlorobenzene	1,440	35.4	2,360	0	60.9	14.1	122	1,317	8.69	50	
1,2-Dichlorobenzene	1,430	47.2	2,360	0	60.5	18.6	122	1,350	5.62	50	
Benzyl alcohol	233	177	2,360	0	9.86	5	142	202.8	13.8	50	
2-Methylphenol (o-cresol)	1,330	47.2	2,360	0	56.5	36.5	121	1,284	3.71	50	
Hexachloroethane	1,230	47.2	2,360	0	52.1	9.86	123	1,118	9.48	50	
N-Nitrosodi-n-propylamine	1,450	94.4	2,360	0	61.5	29.5	128	1,369	5.78	50	
3&4-Methylphenol (m, p-cresol)	1,370	35.4	2,360	0	58.2	30.6	127	1,333	3.09	50	
Nitrobenzene	1,480	59.0	2,360	0	62.6	30.8	123	1,393	5.82	50	
Isophorone	1,470	47.2	2,360	0	62.5	30.8	128	1,425	3.48	50	

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: **2211617-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **12/5/2022** RunNo: **80657**  
 Client ID: **BATCH** Batch ID: **38724** Analysis Date: **12/14/2022** SeqNo: **1668277**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Nitrophenol	1,610	35.4	2,360	0	68.1	30.3	126	1,486	7.78	50	
2,4-Dimethylphenol	1,500	35.4	2,360	0	63.7	32.2	120	1,405	6.74	50	
Bis(2-chloroethoxy)methane	1,500	35.4	2,360	0	63.5	34.3	120	1,437	4.16	50	
2,4-Dichlorophenol	1,500	35.4	2,360	0	63.4	33.7	123	1,464	2.20	50	
1,2,4-Trichlorobenzene	1,510	35.4	2,360	0	63.9	33.7	116	1,429	5.36	50	
Naphthalene	1,530	47.2	2,360	0	65.0	33.3	119	1,467	4.52	50	
4-Chloroaniline	1,240	35.4	2,360	0	52.5	10.2	120	1,147	7.71	50	
Hexachlorobutadiene	1,610	35.4	2,360	0	68.3	32.2	118	1,485	8.20	50	
4-Chloro-3-methylphenol	1,280	35.4	2,360	0	54.3	35.4	133	1,187	7.62	50	
2-Methylnaphthalene	1,550	35.4	2,360	0	65.7	39.4	117	1,444	7.16	50	
1-Methylnaphthalene	1,560	35.4	2,360	0	66.1	37.1	121	1,454	7.02	50	
Hexachlorocyclopentadiene	398	118	2,360	0	16.9	5	134	320.3	21.7	50	
2,4,6-Trichlorophenol	1,590	35.4	2,360	0	67.5	37.2	129	1,475	7.62	50	
2,4,5-Trichlorophenol	1,540	35.4	2,360	0	65.4	37.1	124	1,493	3.40	50	
2-Chloronaphthalene	1,550	35.4	2,360	0	65.9	40.8	117	1,475	5.26	50	
2-Nitroaniline	1,540	59.0	2,360	0	65.2	40.4	131	1,470	4.58	50	
Acenaphthene	1,570	35.4	2,360	0	66.7	34.1	119	1,472	6.69	50	
Dimethylphthalate	1590	1,650	2,360	0	67.2	37	126	1,493	6.08	50	
2,6-Dinitrotoluene	1,580	47.2	2,360	0	66.8	43.4	123	1,521	3.63	50	
Acenaphthylene	1,600	35.4	2,360	0	67.7	38.5	115	1,507	5.82	50	
2,4-Dinitrophenol	2,160	354	4,720	0	45.8	5	127	1,964	9.57	50	
Dibenzofuran	1,530	35.4	2,360	0	65.0	39	119	1,454	5.31	50	
2,4-Dinitrotoluene	1,520	70.8	2,360	0	64.5	40.1	127	1,423	6.82	50	
4-Nitrophenol	1,240	236	2,360	0	52.6	7.49	136	1,132	9.18	50	
Fluorene	1,510	35.4	2,360	0	64.0	34.2	124	1,435	5.07	50	
4-Chlorophenyl phenyl ether	1,590	35.4	2,360	0	67.6	38.8	124	1,519	4.84	50	
Diethylphthalate	1,470	885	2,360	0	62.5	40.1	122	1,368	7.51	50	
4,6-Dinitro-2-methylphenol	1,540	295	2,360	0	65.3	5	142	1,443	6.63	50	
4-Bromophenyl phenyl ether	1,590	35.4	2,360	0	67.5	38.5	124	1,530	4.01	50	
Hexachlorobenzene	1,600	35.4	2,360	0	67.9	40.4	122	1,504	6.36	50	
Pentachlorophenol	1,480	236	2,360	0	62.8	16.6	148	1,321	11.5	50	
Phenanthrene	1,530	35.4	2,360	0	64.9	29.1	128	1,459	4.81	50	

Work Order: 2211603  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: **2211617-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **12/5/2022** RunNo: **80657**  
 Client ID: **BATCH** Batch ID: **38724** Analysis Date: **12/14/2022** SeqNo: **1668277**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Anthracene	1,500	35.4	2,360	0	63.4	32.5	124	1,447	3.42	50	
Carbazole	1,510	35.4	2,360	0	64.0	33.5	126	1,419	6.32	50	
Di-n-butylphthalate	1,520	35.4	2,360	0	64.5	38.3	134	1,441	5.49	50	
Fluoranthene	1,560	35.4	2,360	0	66.1	30	132	1,480	5.25	50	
Pyrene	1,560	177	2,360	0	66.1	30.9	130	1,488	4.70	50	
Butyl Benzylphthalate	1,540	59.0	2,360	0	65.3	35	147	1,457	5.59	50	
bis(2-Ethylhexyl)adipate	1,460	236	2,360	0	61.8	34.2	149	1,402	3.97	50	
Benz(a)anthracene	1,570	35.4	2,360	0	66.3	25	134	1,514	3.33	50	
Chrysene	1,430	59.0	2,360	0	60.7	28.6	125	1,403	2.13	50	
bis (2-Ethylhexyl) phthalate	1,470	47.2	2,360	0	62.3	22.9	158	1,401	4.81	50	
Di-n-octyl phthalate	1,430	88.5	2,360	0	60.8	36.9	157	1,389	3.18	50	
Benzo(b)fluoranthene	1,290	118	2,360	0	54.7	21.4	140	1,225	5.27	50	
Benzo(k)fluoranthene	1,360	35.4	2,360	0	57.4	20.2	139	1,345	0.738	50	
Benzo(a)pyrene	1,150	47.2	2,360	0	48.8	17.6	149	1,125	2.42	50	
Indeno(1,2,3-cd)pyrene	1,020	236	2,360	0	43.2	22.7	139	973.6	4.61	50	
Dibenz(a,h)anthracene	1,190	118	2,360	0	50.4	23.7	145	1,267	6.31	50	
Benzo(g,h,i)perylene	782	118	2,360	0	33.1	18.6	134	801.7	2.54	50	
Surr: 2,4,6-Tribromophenol	1,580		2,360		66.8	16.2	150		0		
Surr: 2-Fluorobiphenyl	799		1,180		67.7	25.3	139		0		
Surr: Nitrobenzene-d5	703		1,180		59.6	12.7	143		0		
Surr: Phenol-d6	1,390		2,360		58.7	21.4	139		0		
Surr: p-Terphenyl	777		1,180		65.8	37.1	144		0		

Client Name: LIBBY	Work Order Number: 2211603
Logged by: Clare Griggs	Date Received: 11/30/2022 11:42:00 AM

**Chain of Custody**

1. Is Chain of Custody complete?      Yes       No       Not Present
2. How was the sample delivered?      Client

**Log In**

3. Coolers are present?      Yes       No       NA
4. Shipping container/cooler in good condition?      Yes       No
5. Custody Seals present on shipping container/cooler?  
(Refer to comments for Custody Seals not intact)      Yes       No       Not Present
6. Was an attempt made to cool the samples?      Yes       No       NA
7. Were all items received at a temperature of >2°C to 6°C \*      Yes       No       NA
8. Sample(s) in proper container(s)?      Yes       No
9. Sufficient sample volume for indicated test(s)?      Yes       No
10. Are samples properly preserved?      Yes       No
11. Was preservative added to bottles?      Yes       No       NA
12. Is there headspace in the VOA vials?      Yes       No       NA
13. Did all samples containers arrive in good condition(unbroken)?      Yes       No
14. Does paperwork match bottle labels?      Yes       No
15. Are matrices correctly identified on Chain of Custody?      Yes       No
16. Is it clear what analyses were requested?      Yes       No
17. Were all holding times able to be met?      Yes       No

**Special Handling (if applicable)**

18. Was client notified of all discrepancies with this order?      Yes       No       NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

**Item Information**

Item #	Temp °C
Sample	3.9

\* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K119**

### Sending Laboratory:

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

### Subcontracted Laboratory:

2211603

Fremont Analytical, Inc.  
3600 Fremont Ave N  
Seattle, WA 98103  
Phone: (206) 352-3790  
Fax:

Requested Turnaround (TAT)

Std

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

**Client Sample ID:** WB-SO-SD69-0005 **Soil Sampled:** 11/28/2022 09:30 **Lab ID:** L22K119-01

8270 SVOC

TOC

Metals SUB Ag

Metals SUB As

Metals SUB Cd

Metals SUB Cr

Metals SUB Cu

Metals SUB Pb

Metals SUB Zn

Grain Size

Report to MDL

6000 method please

6000 method please

6000 method please

6000 method please

6000 method please

6000 method please

6000 method please

Containers Supplied:

**Client Sample ID:** WB-SO-SD68-0005 **Soil Sampled:** 11/28/2022 09:55 **Lab ID:** L22K119-02

8270 SVOC

TOC

Metals SUB Cu

Metals SUB Pb

Metals SUB Cr

Metals SUB As

Metals SUB Ag

Metals SUB Cd

Metals SUB Zn

Grain Size

Report to MDL

6000 method please

6000 method please

6000 method please

6000 method please

6000 method please

6000 method please

6000 method please

Containers Supplied:

**Client Sample ID:** WB-SO-SD67-0005 **Soil Sampled:** 11/28/2022 10:15 **Lab ID:** L22K119-03

8270 SVOC

TOC

Metals SUB As

Metals SUB Zn

Report to MDL

6000 method please

6000 method please

*Applied Chemistry*

Released By

*Gweneth Anderson*

11/30/22

Date

*Kathleen Re*

Received By

11/30

Date

11-42

11-29-22





# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K119  
(Continued)**

**Project:** Solid Wood Inc.

2211603

Analysis	Comments
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<b>Client Sample ID: WB-SO-SD67-0005</b> Soil Sampled: 11/28/2022 10:15	Lab ID: L22K119-03
---	--------------------

Metals SUB Pb Metals SUB Cu Metals SUB Cd Metals SUB Ag Metals SUB Cr Grain Size  <i>Containers Supplied:</i>	6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
--	--

<b>Client Sample ID: WB-SO-SD66-0005</b> Soil Sampled: 11/28/2022 10:45	Lab ID: L22K119-04
---	--------------------

8270 SVOC TOC Metals SUB Cr Metals SUB Cd Metals SUB Zn Metals SUB Pb Metals SUB As Metals SUB Cu Metals SUB Ag Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
--	---

<b>Client Sample ID: WB-SO-SD65-0005</b> Soil Sampled: 11/28/2022 11:05	Lab ID: L22K119-05
---	--------------------

8270 SVOC TOC Metals SUB Ag Metals SUB Zn Metals SUB Pb Metals SUB Cu Metals SUB Cr Metals SUB As Metals SUB Cd Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
--	---

<b>Client Sample ID: WB-SO-SD60-0005</b> Soil Sampled: 11/28/2022 11:45	Lab ID: L22K119-06
---	--------------------

8270 SVOC TOC Metals SUB As Metals SUB Ag	Report to MDL  6000 method please 6000 method please
--	---

*Jodie Chubb*  
Released By

11/30/22  
Date

*Kath [Signature]*  
Received By

11/30  
11:42  
Date



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K119  
(Continued)**

**Project:** Solid Wood Inc.

2211603

Analysis	Comments
<b>Client Sample ID: WB-SO-SD60-0005</b> <i>Soil Sampled: 11/28/2022 11:45</i> Lab ID: L22K119-06	
Metals SUB Cd Metals SUB Cu Metals SUB Cr Metals SUB Pb Metals SUB Zn Grain Size  <i>Containers Supplied:</i>	6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD60-0020</b> <i>Soil Sampled: 11/28/2022 12:10</i> Lab ID: L22K119-07	
8270 SVOC TOC Metals SUB Zn Metals SUB Pb Metals SUB Cu Metals SUB Cr Metals SUB Ag Metals SUB As Metals SUB Cd Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD61-0005</b> <i>Soil Sampled: 11/28/2022 12:42</i> Lab ID: L22K119-08	
8270 SVOC TOC Metals SUB Pb Metals SUB As Metals SUB Cd Metals SUB Cu Metals SUB Cr Metals SUB Ag Metals SUB Zn Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD61-0020</b> <i>Soil Sampled: 11/28/2022 13:10</i> Lab ID: L22K119-09	
8270 SVOC TOC Metals SUB As Metals SUB Ag	Report to MDL  6000 method please 6000 method please

*Jodie Christman*  
Released By

*11/30/22*  
Date

*[Signature]*  
Received By

*11/30/22*  
Date  
*11:42*



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K119  
(Continued)**

2211603

**Project:** Solid Wood Inc.

Analysis	Comments
<b>Client Sample ID: WB-SO-SD61-0020 Soil Sampled: 11/28/2022 13:10</b> <span style="float: right;">Lab ID: L22K119-09</span>	
Metals SUB Cd Metals SUB Cr Metals SUB Cu Metals SUB Pb Metals SUB Zn Grain Size  <i>Containers Supplied:</i>	6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD62-0005 Soil Sampled: 11/28/2022 13:40</b> <span style="float: right;">Lab ID: L22K119-10</span>	
8270 SVOC TOC Metals SUB Pb Metals SUB Ag Metals SUB Cu Metals SUB Zn Metals SUB As Metals SUB Cd Metals SUB Cr Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD62-0020 Soil Sampled: 11/28/2022 14:05</b> <span style="float: right;">Lab ID: L22K119-11</span>	
8270 SVOC TOC Metals SUB Cu Metals SUB Pb Metals SUB Cr Metals SUB Cd Metals SUB As Metals SUB Ag Metals SUB Zn Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD63-0005 Soil Sampled: 11/28/2022 14:30</b> <span style="float: right;">Lab ID: L22K119-12</span>	
8270 SVOC TOC Metals SUB Cr Metals SUB Zn	Report to MDL  6000 method please 6000 method please

*Spide Chisholm*  
Released By

11/30/22  
Date

*Thath J*  
Received By

11/30  
Date  
1142





# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K119  
(Continued)**

**Project:** Solid Wood Inc.

2211603

Analysis	Comments
<b>Client Sample ID: WB-SO-SD63-0005    Soil Sampled: 11/28/2022 14:30</b> <span style="float: right;">Lab ID: L22K119-12</span>	
Metals SUB Cu Metals SUB As Metals SUB Ag Metals SUB Cd Metals SUB Pb Grain Size  <i>Containers Supplied:</i>	6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
<b>Client Sample ID: WB-SO-SD63-0020    Soil Sampled: 11/28/2022 14:45</b> <span style="float: right;">Lab ID: L22K119-13</span>	
8270 SVOC TOC Metals SUB Zn Metals SUB Pb Metals SUB Cu Metals SUB Cr Metals SUB Cd Metals SUB Ag Metals SUB As Grain Size  <i>Containers Supplied:</i>	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please

*Jodie Andrews*  
Released By

*11/30/22*  
Date

*Katherine Bo*  
Received By

*11/30*  
Date  
*11:42*



**Client:** Fremont Analytical, Inc.  
**Address:** 3600 Fremont Avenue N  
Seattle, WA 98103  
**Attn:** Brianna Barnes & Matt Langston  
**Revised on:** \_\_\_\_\_

**Date:** January 3, 2023  
**Project:** Q.C. - Fremont Analytical  
**Project #:** 21S095-01  
**Sample #:** B22-1474  
**Date sampled:** November 28, 2022

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	See Attached Report	Sulfate Soundness	
	Proctor		Bulk Density & Voids	
	Sand Equivalent		WSDOT Degradation	
	Fracture Count		LA Abrasion	
	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,  
 Alex Eifrig  
 WABO Supervising Laboratory Technician

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-001A, WB-SO-SD69-0005 <b>Sample#:</b> B22-1474	<b>Date Received:</b> 29-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 30-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soil Classification System, ASTM-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray-Brown	 ACCREDITED Certificate # 1356-01
---	--	--	---

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b> No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.008 mm D <sub>(10)</sub> = 0.015 mm D <sub>(15)</sub> = 0.023 mm D <sub>(30)</sub> = 0.046 mm D <sub>(50)</sub> = 0.078 mm D <sub>(60)</sub> = 0.104 mm D <sub>(90)</sub> = 0.392 mm Dust Ratio = 41/77	% Gravel = 1.1% % Sand = 50.1% % Silt & Clay = 48.8% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.33 Coeff. of Uniformity, C <sub>u</sub> = 6.78 Fineness Modulus = 0.56 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		99%	100.0%	0.0%
#4	4.75	99%	99%	100.0%	0.0%
#8	2.36		96%	100.0%	0.0%
#10	2.00	96%	96%	100.0%	0.0%
#16	1.18		94%	100.0%	0.0%
#20	0.850		93%	100.0%	0.0%
#30	0.600		92%	100.0%	0.0%
#40	0.425	92%	92%	100.0%	0.0%
#50	0.300		85%	100.0%	0.0%
#60	0.250		83%	100.0%	0.0%
#80	0.180		79%	100.0%	0.0%
#100	0.150	78%	78%	100.0%	0.0%
#140	0.106		61%	100.0%	0.0%
#170	0.090		55%	100.0%	0.0%
#200	0.075	48.8%	48.8%	100.0%	0.0%

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 All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig





CHAIN OF CUSTODY RECORD

Order # 1001155

Page 2

ADDRESS

Environmental, Inc.  
 2000 Lyndon B. Johnson  
 Freeway, Suite 2810B  
 Dallas, TX 75243  
 TEL: 214-342-1700  
 FAX: 214-342-1708

**Q.C. - Fremont Analytical**

**Project # -> TBA ->**

<b>MTA</b> 777 Chrysler Drive Burlington, MA 01825 (978) 241-4774	<b>Materials Testing and Control</b> 777 Chrysler Drive Burlington, MA 01825 (978) 241-4774	Add total volume for WB-SC-SD69-0005 sent on 12-28-88
--	--	---

INDEX	SAMPLE ID	CONTAINER	REMARKS	DATE	TIME	ANALYSIS
1	<del>221603-0005</del> <b>301A</b> <del>WB-SC-SD69-0005</del> <b>UP 12/28</b>	WB-SC-SD69-0005	CLEAR JARS 17 <b>UP 12/28</b>	11/28/2022	9:30:00 AM	Grain Size Analysis <b>12</b> <b>12/28</b>
2	221603-002B PHY-GRAIN	WB-SC-SD68-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis
3	221603-003B PHY-GRAIN	WB-SC-SD68-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis
4	221603-004B PHY-GRAIN	WB-SC-SD66-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis
5	221603-005B PHY-GRAIN	WB-SC-SD66-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis
6	221603-006B PHY-GRAIN	WB-SC-SD66-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis
7	221603-007B PHY-GRAIN	WB-SC-SD66-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis
8	221603-008B PHY-GRAIN	WB-SC-SD66-0005	CLEAR JARS 32	11/28/2022	12:40:00 PM	Grain Size Analysis
9	221603-009B PHY-GRAIN	WB-SC-SD66-0005	CLEAR JARS 32	11/28/2022	11:00:00 AM	Grain Size Analysis

**822-1474**

*Gray-brown silt w/ sand & clay & organics*

*Outgoing  
Temp: 1°C*

Relinquished By: <i>[Signature]</i>	Date: 12/28	Time: 9:29	Received By: <i>[Signature]</i>	Date: 12/29	Time: 4:51
Relinquished By: <i>[Signature]</i>	Date: 12/28	Time: 11:53	Received By: <i>[Signature]</i>	Date: 12/29	Time: 4:51
TYP: _____ Sample: _____ RESULT: _____ COMMENTS: _____			TYP: _____ Sample: _____ RESULT: _____ COMMENTS: _____		

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**Client:** Fremont Analytical, Inc.  
**Address:** 3600 Fremont Avenue N  
Seattle, WA 98103  
**Attn:** Brianna Barnes & Matt Langston  
**Revised on:** \_\_\_\_\_

**Date:** January 3, 2023  
**Project:** Q.C. - Fremont Analytical  
**Project #:** 21S095-01  
**Sample #:** B22-1450 - 1470  
**Date sampled:** November 28 - 30, 2022

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	See Attached Reports	Sulfate Soundness	
	Proctor		Bulk Density & Voids	
	Sand Equivalent		WSDOT Degradation	
	Fracture Count		LA Abrasion	
	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,  
 Alex Eifrig  
 WABO Supervising Laboratory Technician

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-002B, WB-SO-SD68-0005 <b>Sample#:</b> B22-1452	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray	
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>	D <sub>(5)</sub> = 0.007 mm D <sub>(10)</sub> = 0.014 mm D <sub>(15)</sub> = 0.021 mm D <sub>(30)</sub> = 0.042 mm D <sub>(50)</sub> = 0.071 mm D <sub>(60)</sub> = 0.110 mm D <sub>(90)</sub> = 1.466 mm Dust Ratio = 13/20	% Gravel = 0.0% % Sand = 46.9% % Silt & Clay = 53.1% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.16 Coeff. of Uniformity, C <sub>u</sub> = 7.77 Fineness Modulus = 0.91 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		95%	100.0%	0.0%
#10	2.00	94%	94%	100.0%	0.0%
#16	1.18		88%	100.0%	0.0%
#20	0.850		85%	100.0%	0.0%
#30	0.600		83%	100.0%	0.0%
#40	0.425	82%	82%	100.0%	0.0%
#50	0.300		75%	100.0%	0.0%
#60	0.250		73%	100.0%	0.0%
#80	0.180		69%	100.0%	0.0%
#100	0.150	68%	68%	100.0%	0.0%
#140	0.106		59%	100.0%	0.0%
#170	0.090		56%	100.0%	0.0%
#200	0.075	53.1%	53.1%	100.0%	0.0%

Grain Size Distribution

+ Sieve Sizes    — Max Specs    — Min Specs    — Sieve Results

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-003B, WB-SO-SD67-0005 <b>Sample#:</b> B22-1453	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray	
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>		D <sub>(5)</sub> = 0.007 mm      % Gravel = 1.4% D <sub>(10)</sub> = 0.015 mm     % Sand = 47.3% D <sub>(15)</sub> = 0.022 mm     % Silt & Clay = 51.3% D <sub>(30)</sub> = 0.044 mm     Liquid Limit = n/a D <sub>(50)</sub> = 0.073 mm     Plasticity Index = n/a D <sub>(60)</sub> = 0.114 mm     Sand Equivalent = n/a D <sub>(90)</sub> = 1.535 mm     Fracture % , 1 Face = n/a Dust Ratio = 28/45     Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.15 Coeff. of Uniformity, C <sub>u</sub> = 7.82 Fineness Modulus = 0.92 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		99%	100.0%	0.0%
#4	4.75	99%	99%	100.0%	0.0%
#8	2.36		94%	100.0%	0.0%
#10	2.00	93%	93%	100.0%	0.0%
#16	1.18		88%	100.0%	0.0%
#20	0.850		85%	100.0%	0.0%
#30	0.600		84%	100.0%	0.0%
#40	0.425	82%	82%	100.0%	0.0%
#50	0.300		76%	100.0%	0.0%
#60	0.250		73%	100.0%	0.0%
#80	0.180		69%	100.0%	0.0%
#100	0.150	68%	68%	100.0%	0.0%
#140	0.106		58%	100.0%	0.0%
#170	0.090		55%	100.0%	0.0%
#200	0.075	51.3%	51.3%	100.0%	0.0%

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

# Sieve Report

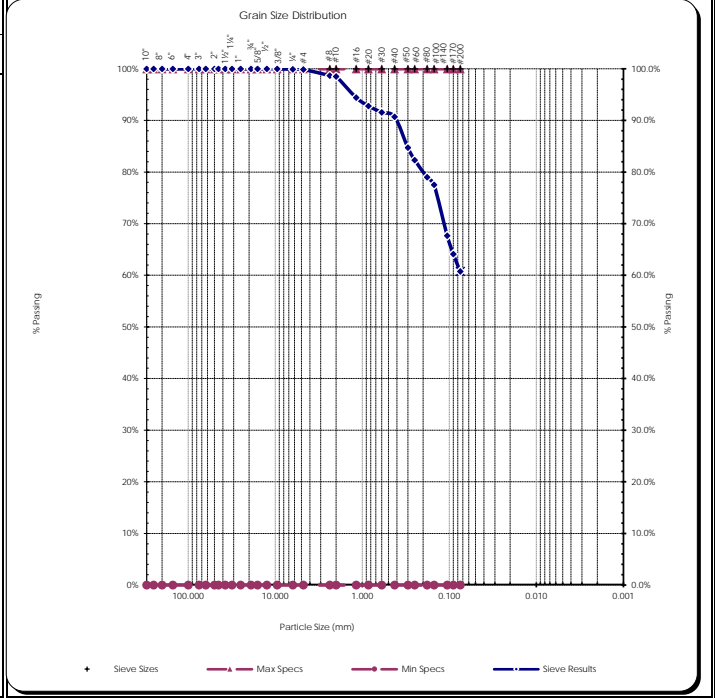
<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-004B, WB-SO-SD66-0005 <b>Sample#:</b> B22-1454	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>		D <sub>(5)</sub> = 0.006 mm      % Gravel = 0.1% D <sub>(10)</sub> = 0.012 mm     % Sand = 39.1% D <sub>(15)</sub> = 0.019 mm     % Silt & Clay = 60.7% D <sub>(30)</sub> = 0.037 mm     Liquid Limit = n/a D <sub>(50)</sub> = 0.062 mm     Plasticity Index = n/a D <sub>(60)</sub> = 0.074 mm     Sand Equivalent = n/a D <sub>(90)</sub> = 0.410 mm     Fracture % , 1 Face = n/a Dust Ratio = 2/3      Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.50 Coeff. of Uniformity, C <sub>u</sub> = 6.00 Fineness Modulus = 0.53 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	<b>Sample Meets Specs ? N/A</b>		

**ASTM C136, ASTM D6913, ASTM C117, ASTM D1140**

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		99%	100.0%	0.0%
#10	2.00	98%	98%	100.0%	0.0%
#16	1.18		94%	100.0%	0.0%
#20	0.850		93%	100.0%	0.0%
#30	0.600		92%	100.0%	0.0%
#40	0.425	91%	91%	100.0%	0.0%
#50	0.300		85%	100.0%	0.0%
#60	0.250		82%	100.0%	0.0%
#80	0.180		79%	100.0%	0.0%
#100	0.150	78%	78%	100.0%	0.0%
#140	0.106		68%	100.0%	0.0%
#170	0.090		64%	100.0%	0.0%
#200	0.075	60.7%	60.7%	100.0%	0.0%



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

Reviewed by: Alex Eifrig  
 Alex Eifrig



# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-005B, WB-SO-SD65-0005 <b>Sample#:</b> B22-1455	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SC-SM, Silty, Clayey Sand <b>Sample Color:</b> Gray	 ACCREDITED Certificate # 1356-01
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>	D <sub>(5)</sub> = 0.009 mm D <sub>(10)</sub> = 0.017 mm D <sub>(15)</sub> = 0.026 mm D <sub>(30)</sub> = 0.051 mm D <sub>(50)</sub> = 0.115 mm D <sub>(60)</sub> = 0.224 mm D <sub>(90)</sub> = 1.751 mm Dust Ratio = 49/81	% Gravel = 2.4% % Sand = 53.6% % Silt & Clay = 44.0% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 0.69 Coeff. of Uniformity, C <sub>u</sub> = 13.13 Fineness Modulus = 1.33 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		99%	100.0%	0.0%
1.00"	25.00	99%	99%	100.0%	0.0%
3/4"	19.00	99%	99%	100.0%	0.0%
5/8"	16.00		99%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		98%	100.0%	0.0%
#4	4.75	98%	98%	100.0%	0.0%
#8	2.36		94%	100.0%	0.0%
#10	2.00	93%	93%	100.0%	0.0%
#16	1.18		83%	100.0%	0.0%
#20	0.850		78%	100.0%	0.0%
#30	0.600		75%	100.0%	0.0%
#40	0.425	73%	73%	100.0%	0.0%
#50	0.300		65%	100.0%	0.0%
#60	0.250		62%	100.0%	0.0%
#80	0.180		57%	100.0%	0.0%
#100	0.150	55%	55%	100.0%	0.0%
#140	0.106		49%	100.0%	0.0%
#170	0.090		46%	100.0%	0.0%
#200	0.075	44.0%	44.0%	100.0%	0.0%

Grain Size Distribution

+ Sieve Sizes    — Max Specs    — Min Specs    — Sieve Results

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

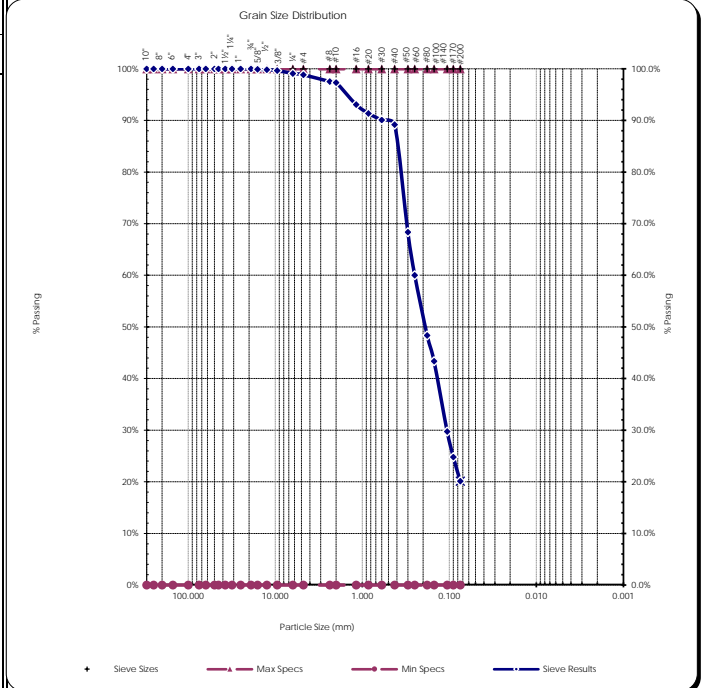
# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-006B, WB-SO-SD60-0005 <b>Sample#:</b> B22-1456	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>	D <sub>(5)</sub> = 0.019 mm D <sub>(10)</sub> = 0.037 mm D <sub>(15)</sub> = 0.056 mm D <sub>(30)</sub> = 0.107 mm D <sub>(50)</sub> = 0.190 mm D <sub>(60)</sub> = 0.250 mm D <sub>(90)</sub> = 0.586 mm Dust Ratio = 7/31	% Gravel = 1.2% % Sand = 78.7% % Silt & Clay = 20.1% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.23 Coeff. of Uniformity, C <sub>u</sub> = 6.71 Fineness Modulus = 1.09 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		99%	100.0%	0.0%
#4	4.75	99%	99%	100.0%	0.0%
#8	2.36		98%	100.0%	0.0%
#10	2.00	97%	97%	100.0%	0.0%
#16	1.18		93%	100.0%	0.0%
#20	0.850		91%	100.0%	0.0%
#30	0.600		90%	100.0%	0.0%
#40	0.425	89%	89%	100.0%	0.0%
#50	0.300		68%	100.0%	0.0%
#60	0.250		60%	100.0%	0.0%
#80	0.180		48%	100.0%	0.0%
#100	0.150	43%	43%	100.0%	0.0%
#140	0.106		30%	100.0%	0.0%
#170	0.090		25%	100.0%	0.0%
#200	0.075	20.1%	20.1%	100.0%	0.0%



All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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

Reviewed by: Alex Eifrig  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-007B, WB-SO-SD60-0020 <b>Sample#:</b> B22-1457	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray	 ACCREDITED Certificate # 1356-01
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b> No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.020 mm D <sub>(10)</sub> = 0.040 mm D <sub>(15)</sub> = 0.059 mm D <sub>(30)</sub> = 0.120 mm D <sub>(50)</sub> = 0.252 mm D <sub>(60)</sub> = 0.333 mm D <sub>(90)</sub> = 2.985 mm Dust Ratio = 4/15	% Gravel = 5.0% % Sand = 76.0% % Silt & Clay = 19.0% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.09 Coeff. of Uniformity, C <sub>u</sub> = 8.44 Fineness Modulus = 1.73 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	99%	99%	100.0%	0.0%
5/8"	16.00		99%	100.0%	0.0%
1/2"	12.50	99%	99%	100.0%	0.0%
3/8"	9.50	99%	99%	100.0%	0.0%
1/4"	6.30		96%	100.0%	0.0%
#4	4.75	95%	95%	100.0%	0.0%
#8	2.36		88%	100.0%	0.0%
#10	2.00	87%	87%	100.0%	0.0%
#16	1.18		79%	100.0%	0.0%
#20	0.850		76%	100.0%	0.0%
#30	0.600		73%	100.0%	0.0%
#40	0.425	71%	71%	100.0%	0.0%
#50	0.300		56%	100.0%	0.0%
#60	0.250		50%	100.0%	0.0%
#80	0.180		41%	100.0%	0.0%
#100	0.150	37%	37%	100.0%	0.0%
#140	0.106		27%	100.0%	0.0%
#170	0.090		23%	100.0%	0.0%
#200	0.075	19.0%	19.0%	100.0%	0.0%

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-008B, WB-SO-SD61-0005 <b>Sample#:</b> B22-1458	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray	 ACCREDITED Certificate # 1356.D1
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b> No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.013 mm D <sub>(10)</sub> = 0.026 mm D <sub>(15)</sub> = 0.039 mm D <sub>(30)</sub> = 0.079 mm D <sub>(50)</sub> = 0.132 mm D <sub>(60)</sub> = 0.183 mm D <sub>(90)</sub> = 2.063 mm Dust Ratio = 17/50	% Gravel = 5.0% % Sand = 66.5% % Silt & Clay = 28.5% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.29 Coeff. of Uniformity, C <sub>u</sub> = 6.97 Fineness Modulus = 1.17 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	99%	99%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		96%	100.0%	0.0%
#4	4.75	95%	95%	100.0%	0.0%
#8	2.36		91%	100.0%	0.0%
#10	2.00	90%	90%	100.0%	0.0%
#16	1.18		87%	100.0%	0.0%
#20	0.850		86%	100.0%	0.0%
#30	0.600		85%	100.0%	0.0%
#40	0.425	84%	84%	100.0%	0.0%
#50	0.300		72%	100.0%	0.0%
#60	0.250		67%	100.0%	0.0%
#80	0.180		60%	100.0%	0.0%
#100	0.150	57%	57%	100.0%	0.0%
#140	0.106		40%	100.0%	0.0%
#170	0.090		34%	100.0%	0.0%
#200	0.075	28.5%	28.5%	100.0%	0.0%

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

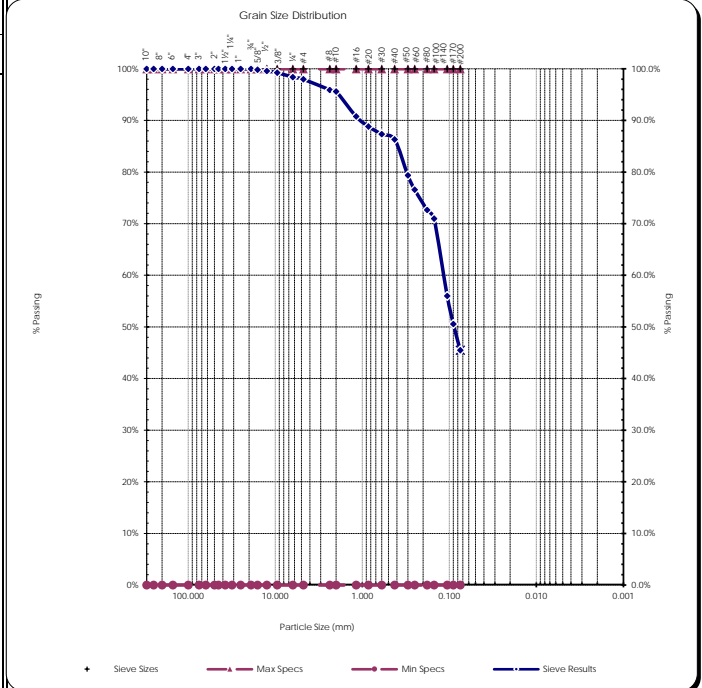
Reviewed by: Alex Eifrig  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-009B, WB-SO-SD61-0020 <b>Sample#:</b> B22-1459	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SC-SM, Silty, Clayey Sand <b>Sample Color:</b> Gray	
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b> No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.008 mm D <sub>(10)</sub> = 0.016 mm D <sub>(15)</sub> = 0.025 mm D <sub>(30)</sub> = 0.049 mm D <sub>(50)</sub> = 0.088 mm D <sub>(60)</sub> = 0.118 mm D <sub>(90)</sub> = 1.050 mm Dust Ratio = 49/93	% Gravel = 2.0% % Sand = 52.5% % Silt & Clay = 45.5% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.26 Coeff. of Uniformity, C <sub>u</sub> = 7.14 Fineness Modulus = 0.78 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	99%	99%	100.0%	0.0%
1/4"	6.30	98%	98%	100.0%	0.0%
#4	4.75	98%	98%	100.0%	0.0%
#8	2.36	96%	96%	100.0%	0.0%
#10	2.00	96%	96%	100.0%	0.0%
#16	1.18	91%	91%	100.0%	0.0%
#20	0.850	89%	89%	100.0%	0.0%
#30	0.600	86%	87%	100.0%	0.0%
#40	0.425	86%	86%	100.0%	0.0%
#50	0.300	79%	79%	100.0%	0.0%
#60	0.250	77%	77%	100.0%	0.0%
#80	0.180	73%	73%	100.0%	0.0%
#100	0.150	71%	71%	100.0%	0.0%
#140	0.106		56%	100.0%	0.0%
#170	0.090		51%	100.0%	0.0%
#200	0.075	45.5%	45.5%	100.0%	0.0%



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

Reviewed by: Alex Eifrig  
 Alex Eifrig

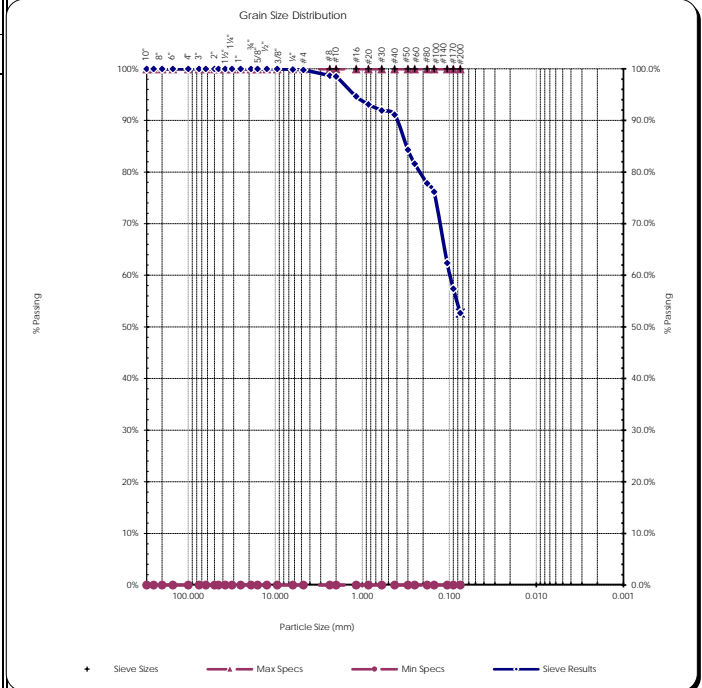
# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-010B, WB-SO-SD62-0005 <b>Sample#:</b> B22-1460	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>	D <sub>(5)</sub> = 0.007 mm D <sub>(10)</sub> = 0.014 mm D <sub>(15)</sub> = 0.021 mm D <sub>(30)</sub> = 0.043 mm D <sub>(50)</sub> = 0.071 mm D <sub>(60)</sub> = 0.098 mm D <sub>(90)</sub> = 0.405 mm Dust Ratio = 11/19	% Gravel = 0.2% % Sand = 47.1% % Silt & Clay = 52.7% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.30 Coeff. of Uniformity, C <sub>u</sub> = 6.91 Fineness Modulus = 0.54 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		99%	100.0%	0.0%
#10	2.00	99%	99%	100.0%	0.0%
#16	1.18		95%	100.0%	0.0%
#20	0.850		93%	100.0%	0.0%
#30	0.600		92%	100.0%	0.0%
#40	0.425	91%	91%	100.0%	0.0%
#50	0.300		84%	100.0%	0.0%
#60	0.250		82%	100.0%	0.0%
#80	0.180		78%	100.0%	0.0%
#100	0.150	76%	76%	100.0%	0.0%
#140	0.106		62%	100.0%	0.0%
#170	0.090		57%	100.0%	0.0%
#200	0.075	52.7%	52.7%	100.0%	0.0%



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

Reviewed by: Alex Eifrig  
 Alex Eifrig



# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-011B, WB-SO-SD62-0020 <b>Sample#:</b> B22-1461	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray	 ACCREDITED Certificate # 1356-D1
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>		D <sub>(5)</sub> = 0.007 mm      % Gravel = 0.3% D <sub>(10)</sub> = 0.013 mm      % Sand = 43.2% D <sub>(15)</sub> = 0.020 mm      % Silt & Clay = 56.5% D <sub>(30)</sub> = 0.040 mm      Liquid Limit = n/a D <sub>(50)</sub> = 0.066 mm      Plasticity Index = n/a D <sub>(60)</sub> = 0.088 mm      Sand Equivalent = n/a D <sub>(90)</sub> = 0.381 mm      Fracture % , 1 Face = n/a Dust Ratio = 47/77      Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.35 Coeff. of Uniformity, C <sub>u</sub> = 6.66 Fineness Modulus = 0.51 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		99%	100.0%	0.0%
#10	2.00	99%	99%	100.0%	0.0%
#16	1.18		96%	100.0%	0.0%
#20	0.850		94%	100.0%	0.0%
#30	0.600		93%	100.0%	0.0%
#40	0.425	93%	93%	100.0%	0.0%
#50	0.300		85%	100.0%	0.0%
#60	0.250		82%	100.0%	0.0%
#80	0.180		78%	100.0%	0.0%
#100	0.150	76%	76%	100.0%	0.0%
#140	0.106		65%	100.0%	0.0%
#170	0.090		60%	100.0%	0.0%
#200	0.075	56.5%	56.5%	100.0%	0.0%

Grain Size Distribution

+ Sieve Sizes    — Max Specs    — Min Specs    — Sieve Results

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

Reviewed by: Alex Eifrig  
 Alex Eifrig

# Sieve Report

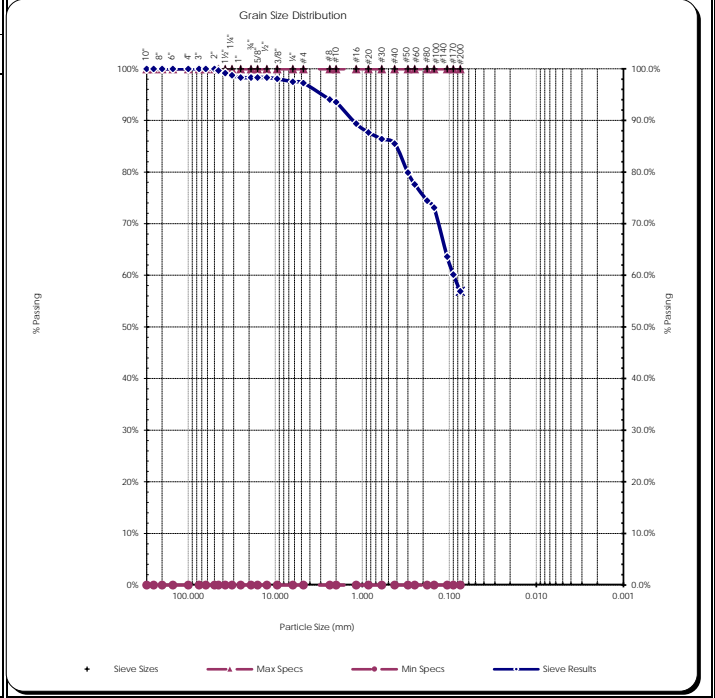
<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-012B, WB-SO-SD63-0005 <b>Sample#:</b> B22-1462	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray
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<b>ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281</b>			
<b>Specifications</b>		D <sub>(5)</sub> = 0.007 mm      % Gravel = 2.8% D <sub>(10)</sub> = 0.013 mm      % Sand = 40.3% D <sub>(15)</sub> = 0.020 mm      % Silt & Clay = 56.9% D <sub>(30)</sub> = 0.040 mm      Liquid Limit = n/a D <sub>(50)</sub> = 0.066 mm      Plasticity Index = n/a D <sub>(60)</sub> = 0.089 mm      Sand Equivalent = n/a D <sub>(90)</sub> = 1.303 mm      Fracture % , 1 Face = n/a Dust Ratio = 2/3      Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.33 Coeff. of Uniformity, C <sub>u</sub> = 6.78 Fineness Modulus = 0.84 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	<b>Sample Meets Specs ? N/A</b>		

**ASTM C136, ASTM D6913, ASTM C117, ASTM D1140**

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		99%	100.0%	0.0%
1.25"	31.50		99%	100.0%	0.0%
1.00"	25.00	98%	98%	100.0%	0.0%
3/4"	19.00	98%	98%	100.0%	0.0%
5/8"	16.00		98%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		98%	100.0%	0.0%
#4	4.75	97%	97%	100.0%	0.0%
#8	2.36		94%	100.0%	0.0%
#10	2.00	94%	94%	100.0%	0.0%
#16	1.18		89%	100.0%	0.0%
#20	0.850		88%	100.0%	0.0%
#30	0.600		86%	100.0%	0.0%
#40	0.425	86%	86%	100.0%	0.0%
#50	0.300		80%	100.0%	0.0%
#60	0.250		78%	100.0%	0.0%
#80	0.180		74%	100.0%	0.0%
#100	0.150	73%	73%	100.0%	0.0%
#140	0.106		64%	100.0%	0.0%
#170	0.090		60%	100.0%	0.0%
#200	0.075	56.9%	56.9%	100.0%	0.0%



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

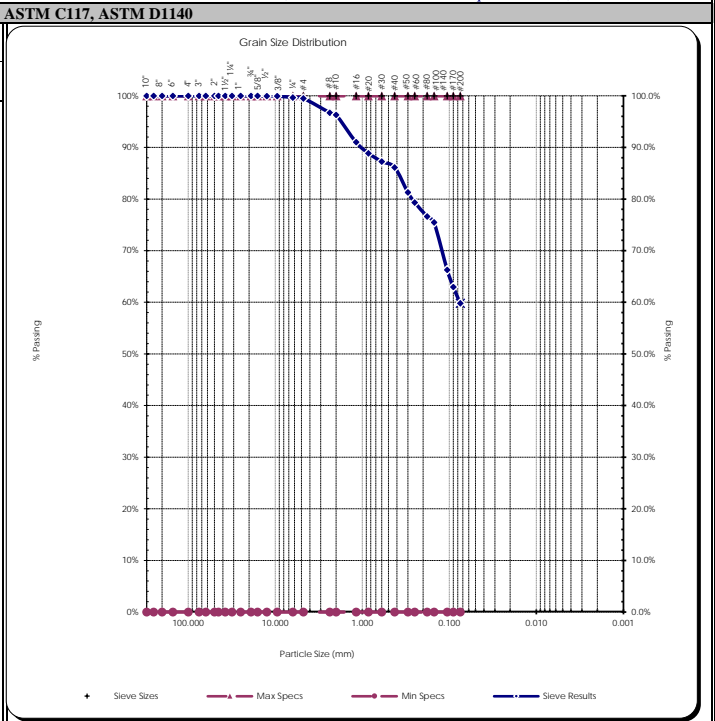
Reviewed by: Alex Eifrig  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-013B, WB-SO-SD63-0020 <b>Sample#:</b> B22-1463	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray	
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>	D <sub>(5)</sub> = 0.006 mm D <sub>(10)</sub> = 0.013 mm D <sub>(15)</sub> = 0.019 mm D <sub>(30)</sub> = 0.038 mm D <sub>(50)</sub> = 0.063 mm D <sub>(60)</sub> = 0.076 mm D <sub>(90)</sub> = 1.024 mm Dust Ratio = 25/36	% Gravel = 0.5% % Sand = 39.7% % Silt & Clay = 59.8% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.49 Coeff. of Uniformity, C <sub>u</sub> = 6.05 Fineness Modulus = 0.69 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
ASTM C136, ASTM D6913, ASTM C117, ASTM D1140			

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	99%	99%	100.0%	0.0%
#8	2.36		97%	100.0%	0.0%
#10	2.00	96%	96%	100.0%	0.0%
#16	1.18		91%	100.0%	0.0%
#20	0.850		89%	100.0%	0.0%
#30	0.600		87%	100.0%	0.0%
#40	0.425	86%	86%	100.0%	0.0%
#50	0.300		81%	100.0%	0.0%
#60	0.250		79%	100.0%	0.0%
#80	0.180		77%	100.0%	0.0%
#100	0.150	75%	75%	100.0%	0.0%
#140	0.106		66%	100.0%	0.0%
#170	0.090		63%	100.0%	0.0%
#200	0.075	59.8%	59.8%	100.0%	0.0%



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 All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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

Reviewed by: Alex Eifrig  
 Alex Eifrig

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CLIENT/PROJECT: <b>MTC</b>	COMPANY: <b>Materials Testing and Consulti</b>	SPECIAL INSTRUCTIONS / COMMENTS:
ADDRESS: <b>777 Chrysler Drive.</b>		Standard FAT. Please email results to Branna Barnes at <a href="mailto:bbarnes@fremontanalytical.com">bbarnes@fremontanalytical.com</a> and Matt Langston at <a href="mailto:mlangston@fremontanalytical.com">mlangston@fremontanalytical.com</a> .
CITY/STATE/ZIP: <b>Burlington, WA 98233</b>		
PHONE: <b>(206) 241-1974</b> FAX: _____ EMAIL: _____		
ACCOUNT #:		

FORM #	NAME/ID	CLIENT SAMPLE ID	BOTTLE TYPE	MATERIAL	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Moisture Preserved Weights NOT Sample Notation Additional Sample Description
<del>1</del>	2211603-001B PHY-GRAIN	WB-SO-SD69-0005	CLEAR JARS 32	Soil	11/28/2022 9:30:00 AM	1	Grainsize Analysis <b>* Sample Destroyed</b>
2	2211603-002B PHY-GRAIN	WB-SO-SD68-0005	CLEAR JARS 32	Soil	11/28/2022 9:55:00 AM	1	Grainsize Analysis <b>B22-1452</b>
3	2211603-003B PHY-GRAIN	WB-SO-SD67-0005	CLEAR JARS 32	Soil	11/28/2022 10:15:00 AM	1	Grainsize Analysis <b>B22-1453</b>
4	2211603-004B PHY-GRAIN	WB-SO-SD66-0005	CLEAR JARS 32	Soil	11/28/2022 10:45:00 AM	1	Grainsize Analysis <b>B22-1454</b>
5	2211603-005B PHY-GRAIN	WB-SO-SD65-0005	CLEAR JARS 32	Soil	11/28/2022 11:05:00 AM	1	Grainsize Analysis <b>B22-1455</b>
6	2211603-006B PHY-GRAIN	WB-SO-SD60-0005	CLEAR JARS 32	Soil	11/28/2022 11:45:00 AM	1	Grainsize Analysis <b>B22-1456</b>
7	2211603-007B PHY-GRAIN	WB-SO-SD60-0020	CLEAR JARS 32	Soil	11/28/2022 12:10:00 PM	1	Grainsize Analysis <b>B22-1457</b>
8	2211603-008B PHY-GRAIN	WB-SO-SD61-0005	CLEAR JARS 32	Soil	11/28/2022 12:42:00 PM	1	Grainsize Analysis <b>B22-1458</b>
9	2211603-009B PHY-GRAIN	WB-SO-SD61-0020	CLEAR JARS 32	Soil	11/28/2022 1:10:00 PM	1	Grainsize Analysis <b>B22-1459</b>

Requested By:	Date:	Time:	Requested By:	Date:	Time:	APPROVAL TRANSMITTAL DESIRED <input type="checkbox"/> ANALYST <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> DELIVER
Requested By:	Date:	Time:	Requested By:	Date:	Time:	
Requested By:	Date:	Time:	Requested By:	Date:	Time:	
TAT: <input type="checkbox"/> Standard <input type="checkbox"/> RUSH <input type="checkbox"/> Next BD <input type="checkbox"/> 24 HR <input type="checkbox"/> 48 HR <input type="checkbox"/>						FOR LAB USE ONLY Temp of sample: _____ Comments: _____
Note: RUSH requests will incur surcharges!						





CHAIN OF CUSTODY RECORD

Omega COCID 1557 PAGE 2 OF 2

ADDRESS  
 Fremont Analytical, Inc.  
 3605 Fremont Ave. N.  
 Seattle, WA 98103  
 TEL: 206-252-8700  
 FAX: 206-252-7178  
 Website: www.fremontanalytical.com

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<b>CLIENT CONTRACTOR:</b> MTC <b>ADDRESS:</b> 777 Chrysler Drive. <b>CITY &amp; STATE/ZIP:</b> Burlington, WA 98233 <b>PHONE:</b> (206) 241-1974 <b>ACCOUNT #:</b>	<b>CLIENT NAME:</b> Materials Testing and Consulti <b>SPECIAL INSTRUCTIONS TO ANALYSTS:</b> Standard TAT. Please email results to Brianna Barnes at <a href="mailto:bbarnes@fremontanalytical.com">bbarnes@fremontanalytical.com</a> and Matt Langston at <a href="mailto:m.langston@fremontanalytical.com">m.langston@fremontanalytical.com</a> .
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ITEM #	SAMPLE ID	CLIENTS SITE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	ANALYSIS: Method of Preservation, # of Samples/Containers, Matrix, Sample ID, Location
✓10	22:1603-0103 PHY-GRAIN	WB-SO-SD62-0005	CLEAR JARS 32	Soil	11/28/2022 1:40:00 PM	1	Grainsize Analysis <b>B22-1460</b>
✓11	22:1603-0116 PHY-GRAIN	WB-SO-SD62-0020	CLEAR JARS 32	Soil	11/28/2022 2:05:00 PM	1	Grainsize Analysis <b>B22-1461</b>
✓12	22:1603-0123 PHY-GRAIN	WB-SO-SD63-0005	CLEAR JARS 32	Soil	11/28/2022 2:30:00 PM	1	Grainsize Analysis <b>B22-1462</b>
✓13	22:1603-0123 PHY-GRAIN	WB-SO-SD63-0020	CLEAR JARS 32	Soil	11/28/2022 2:45:00 PM	1	Grainsize Analysis <b>B22-1463</b>

Relinquished By: <i>Kathleen...</i>	Date: 12/22	Time: 9:29	Received By: <i>Matt Langston</i>	Date: 12/23	Time: 11:26
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
Relinquished By:	Date:	Time:	Received By:	Date:	Time:
TAT:	STANDARD	RUSH	1 hour	2 hours	Next Business Day

Note: RUSH requests will incur surcharges!

REPORT TRANSMIT METHOD DESIRED:
<input type="checkbox"/> HARD COPY (with CD) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
FOR CLASSIFICATION:
Hazardous: _____                    Priority: _____





**Analytical Resources, LLC**  
Analytical Chemists and Consultants

20 December 2022

Sherry Chilcutt  
Libby Environmental  
3322 South Bay Road NE  
Olympia, WA 98506

RE: Dioxin/Furans 2022-2023 (L22K119- Solid Wood Inc.)

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

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

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

Associated Work Order(s)  
22K0553

Associated SDG ID(s)  
N/A

**Shelly Fishel** Digitally signed by Shelly Fishel  
Date: 2022.12.20 19:13:44 -08'00'

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

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

Analytical Resources, LLC

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

Shelly Fishel, Project Manager





721K-553  
**Libby Environmental, Inc.**

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
 ORDER  
 L22K119**

**Sending Laboratory:**

Libby Environmental, Inc.  
 3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: 360-352-2110  
 Fax: 360-352-4154  
  
 Project Manager: Sherry Chilcutt  
 LibbyEnv@gmail.com

**Subcontracted Laboratory:**

Analytical Resources, Inc.  
 4611 South 134th Place  
 Seattle, WA 98109  
 Phone: (206) 695-6210  
 Fax:  
  
**Requested Turnaround (TAT)** 5td

**Project:** Solid Wood Inc.

Analysis	Comments
<b>Client Sample ID: WB-SO-SD60-0005</b> <i>Soil Sampled: 11/28/2022 11:45</i> Lab ID: L22K119-06 Dioxins / Furans <i>Containers Supplied:</i>	Report all isomers and congeners
<b>Client Sample ID: WB-SO-SD60-0020</b> <i>Soil Sampled: 11/28/2022 12:10</i> Lab ID: L22K119-07 Dioxins / Furans <i>Containers Supplied:</i>	HOLD
<b>Client Sample ID: WB-SO-SD61-0005</b> <i>Soil Sampled: 11/28/2022 12:42</i> Lab ID: L22K119-08 Dioxins / Furans <i>Containers Supplied:</i>	Report all isomers and congeners
<b>Client Sample ID: WB-SO-SD61-0020</b> <i>Soil Sampled: 11/28/2022 13:10</i> Lab ID: L22K119-09 Dioxins / Furans <i>Containers Supplied:</i>	HOLD
<b>Client Sample ID: WB-SO-SD62-0005</b> <i>Soil Sampled: 11/28/2022 13:40</i> Lab ID: L22K119-10 Dioxins / Furans <i>Containers Supplied:</i>	Report all isomers and congeners
<b>Client Sample ID: WB-SO-SD62-0020</b> <i>Soil Sampled: 11/28/2022 14:05</i> Lab ID: L22K119-11 Dioxins / Furans <i>Containers Supplied:</i>	HOLD

Bobie Christensen    11/30/22    Phillip RA AR    11/30/22  
 Released By    Date    Received By    Date  
Janeth Anderson    11.29.22







Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WB-SO-SD60-0005	22K0553-01	Solid	28-Nov-2022 11:45	30-Nov-2022 13:05
WB-SO-SD61-0005	22K0553-03	Solid	28-Nov-2022 12:42	30-Nov-2022 13:05
WB-SO-SD62-0005	22K0553-05	Solid	28-Nov-2022 13:40	30-Nov-2022 13:05
WB-SO-SD63-0005	22K0553-07	Solid	28-Nov-2022 14:30	30-Nov-2022 13:05



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

## Work Order Case Narrative

**Client:** Libby Environmental  
**Project:** Dioxin/Furans 2022-2023  
**Project Number:** L22K119- Solid Wood Inc.  
**Work Order:** 22K0553

### Sample receipt

Sample(s) as listed on the preceding page were received 30-Nov-2022 13:05 under ARI work order 22K0553. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### Dioxin/Furans - EPA Method 8290

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column recently developed by Restek. The RTX-Dioxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

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

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.



# Cooler Receipt Form

ARI Client: Libby

Project Name: L22K119

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

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

Assigned ARI Job No. 22-ROSE3

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

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES (NO)

Were custody papers included with the cooler? YES (NO)

Were custody papers properly filled out (ink, signed, etc.)? YES (NO)

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

Time 13:05 4:8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 7009708

Cooler Accepted by: PIB Date: 11/30/22 Time: 13:05

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: Cap 1 box

Was sufficient ice used (if appropriate)? NA YES (NO)

How were bottles sealed in plastic bags? Individually Grouped (No)

Did all bottles arrive in good condition (unbroken)? YES (NO)

Were all bottle labels complete and legible? YES (NO)

Did the number of containers listed on COC match with the number of containers received? YES (NO)

Did all bottle labels and tags agree with custody papers? YES (NO)

Were all bottles used correct for the requested analyses? YES (NO)

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... (NA) YES (NO)

Were all VOC vials free of air bubbles? (NA) YES (NO)

Was sufficient amount of sample sent in each bottle? YES (NO)

Date VOC Trip Blank was made at ARI: (NA)

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

Samples Logged by: [Signature] Date: 11/30/22 Time: \_\_\_\_\_ Labels checked by: PIB

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

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

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 11:45  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 00:46

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 16.13 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-01 A 01 Dry Weight: 10.01 g % Solids: 62.05
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-01 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleaned: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-01 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-01 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.726	0.655-0.886	0.11	1.00	<b>1.22</b>	ng/kg	
2,3,7,8-TCDD		0.718	0.655-0.886	0.12	1.00	<b>0.55</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.263	1.318-1.783	0.10	1.00	<b>0.88</b>	ng/kg	EMPC, J
2,3,4,7,8-PeCDF		1.780	1.318-1.783	0.10	1.00	<b>0.61</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.533	1.318-1.783	0.09	1.00	<b>1.19</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.216	1.054-1.426	0.05	1.00	<b>1.68</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.120	1.054-1.426	0.05	1.00	<b>1.17</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.241	1.054-1.426	0.05	1.00	<b>1.60</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.594	1.054-1.426	0.06	1.00	<b>0.71</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.216	1.054-1.426	0.15	1.00	<b>1.30</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.166	1.054-1.426	0.14	1.00	<b>6.60</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.268	1.054-1.426	0.15	1.00	<b>4.27</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.978	0.893-1.208	0.07	1.00	<b>29.0</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		0.696	0.893-1.208	0.10	1.00	<b>1.21</b>	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.004	0.893-1.208	0.24	2.50	<b>104</b>	ng/kg	
OCDF		0.890	0.757-1.024	0.12	2.50	<b>33.2</b>	ng/kg	
OCDD		0.859	0.757-1.024	0.25	9.99	<b>670</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>10.8</b>	ng/kg	
Total TCDD					1.00	<b>7.57</b>	ng/kg	
Total PeCDF					1.00	<b>14.1</b>	ng/kg	
Total PeCDD					1.00	<b>5.13</b>	ng/kg	
Total HxCDF					1.00	<b>36.5</b>	ng/kg	
Total HxCDD					1.00	<b>61.1</b>	ng/kg	
Total HpCDF					1.00	<b>66.8</b>	ng/kg	
Total HpCDD					1.00	<b>218</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 11:45

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 00:46

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		5.36		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		5.36		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		5.30		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		5.25		



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Olympia WA, 98506

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**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 11:45

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 00:46

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.758	0.655-0.886	24-169 %	60.2	%	
<i>13C12-2,3,7,8-TCDD</i>		0.754	0.655-0.886	25-164 %	80.0	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.556	1.318-1.783	24-185 %	76.7	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.543	1.318-1.783	21-178 %	77.5	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.561	1.318-1.783	25-181 %	87.8	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.496	0.434-0.587	26-152 %	86.3	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.510	0.434-0.587	26-123 %	85.1	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.508	0.434-0.587	28-136 %	88.4	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.487	0.434-0.587	29-147 %	103	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.253	1.054-1.426	32-141 %	87.9	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.210	1.054-1.426	28-130 %	85.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.449	0.374-0.506	28-143 %	75.9	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.442	0.374-0.506	26-138 %	82.2	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.061	0.893-1.208	23-140 %	97.9	%	
<i>13C12-OCDD</i>		0.909	0.757-1.024	17-157 %	102	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	81.6	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 11:45  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-01  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	62.05	%	



Libby Environmental  
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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 12:42  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 01:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 17.41 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-03 A 01 Dry Weight: 10.01 g % Solids: 57.50
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-03 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-03 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-03 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.652	0.655-0.886	0.09	1.00	<b>1.62</b>	ng/kg	EMPC, X
2,3,7,8-TCDD		0.752	0.655-0.886	0.08	1.00	<b>0.28</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.997	1.318-1.783	0.10	1.00	<b>0.70</b>	ng/kg	EMPC, J
2,3,4,7,8-PeCDF		1.616	1.318-1.783	0.10	1.00	<b>0.83</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.547	1.318-1.783	0.13	1.00	<b>1.69</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.341	1.054-1.426	0.06	1.00	<b>2.36</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.450	1.054-1.426	0.06	1.00	<b>1.28</b>	ng/kg	EMPC
2,3,4,6,7,8-HxCDF		1.222	1.054-1.426	0.06	1.00	<b>1.90</b>	ng/kg	
1,2,3,7,8,9-HxCDF			1.054-1.426	0.07	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD		1.265	1.054-1.426	0.11	1.00	<b>1.50</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.324	1.054-1.426	0.11	1.00	<b>6.36</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.294	1.054-1.426	0.12	1.00	<b>3.52</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.986	0.893-1.208	0.07	1.00	<b>32.9</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.272	0.893-1.208	0.10	1.00	<b>1.42</b>	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.048	0.893-1.208	0.16	2.50	<b>104</b>	ng/kg	
OCDF		0.882	0.757-1.024	0.10	2.50	<b>33.8</b>	ng/kg	
OCDD		0.863	0.757-1.024	0.32	9.99	<b>682</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>16.4</b>	ng/kg	
Total TCDD					1.00	<b>6.25</b>	ng/kg	
Total PeCDF					1.00	<b>20.6</b>	ng/kg	
Total PeCDD					1.00	<b>9.53</b>	ng/kg	
Total HxCDF					1.00	<b>42.6</b>	ng/kg	
Total HxCDD					1.00	<b>55.1</b>	ng/kg	
Total HpCDF					1.00	<b>72.8</b>	ng/kg	
Total HpCDD					1.00	<b>225</b>	ng/kg	



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**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 12:42

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 01:35

Analysis by: Analytical Resources, LLC

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		5.70		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		5.69		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		5.53		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		5.37		





Libby Environmental  
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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 12:42

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 01:35

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.758	0.655-0.886	24-169 %	66.2	%	
<i>13C12-2,3,7,8-TCDD</i>		0.763	0.655-0.886	25-164 %	87.8	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.557	1.318-1.783	24-185 %	77.7	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.577	1.318-1.783	21-178 %	79.5	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.600	1.318-1.783	25-181 %	86.6	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.490	0.434-0.587	26-152 %	86.1	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.497	0.434-0.587	26-123 %	85.2	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.500	0.434-0.587	28-136 %	88.5	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.505	0.434-0.587	29-147 %	95.4	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.266	1.054-1.426	32-141 %	90.6	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.249	1.054-1.426	28-130 %	82.8	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.432	0.374-0.506	28-143 %	73.7	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.444	0.374-0.506	26-138 %	77.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.069	0.893-1.208	23-140 %	95.6	%	
<i>13C12-OCDD</i>		0.895	0.757-1.024	17-157 %	96.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	87.9	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 12:42  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-03  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	57.50	%	



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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 13:40  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 02:24

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 20.38 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-05 A 01 Dry Weight: 10.01 g % Solids: 49.12
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-05 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-05 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-05 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.697	0.655-0.886	0.06	1.00	<b>2.04</b>	ng/kg	X
2,3,7,8-TCDD		0.688	0.655-0.886	0.05	1.00	<b>0.58</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.299	1.318-1.783	0.10	1.00	<b>1.43</b>	ng/kg	EMPC
2,3,4,7,8-PeCDF		1.739	1.318-1.783	0.09	1.00	<b>1.63</b>	ng/kg	
1,2,3,7,8-PeCDD		1.808	1.318-1.783	0.08	1.00	<b>2.55</b>	ng/kg	EMPC
1,2,3,4,7,8-HxCDF		1.090	1.054-1.426	0.08	1.00	<b>3.78</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.156	1.054-1.426	0.08	1.00	<b>2.54</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.230	1.054-1.426	0.08	1.00	<b>3.51</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.392	1.054-1.426	0.09	1.00	<b>0.85</b>	ng/kg	J
1,2,3,4,7,8-HxCDD		1.432	1.054-1.426	0.15	1.00	<b>2.18</b>	ng/kg	EMPC
1,2,3,6,7,8-HxCDD		1.317	1.054-1.426	0.15	1.00	<b>10.6</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.191	1.054-1.426	0.16	1.00	<b>5.43</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.989	0.893-1.208	0.07	1.00	<b>48.4</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		0.811	0.893-1.208	0.11	1.00	<b>1.63</b>	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.058	0.893-1.208	0.27	2.50	<b>183</b>	ng/kg	
OCDF		0.926	0.757-1.024	0.14	2.50	<b>41.8</b>	ng/kg	
OCDD		0.852	0.757-1.024	0.30	9.99	<b>1480</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>41.8</b>	ng/kg	
Total TCDD					1.00	<b>10.9</b>	ng/kg	
Total PeCDF					1.00	<b>47.0</b>	ng/kg	
Total PeCDD					1.00	<b>16.8</b>	ng/kg	
Total HxCDF					1.00	<b>74.7</b>	ng/kg	
Total HxCDD					1.00	<b>88.7</b>	ng/kg	
Total HpCDF					1.00	<b>102</b>	ng/kg	
Total HpCDD					1.00	<b>404</b>	ng/kg	



Libby Environmental  
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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 13:40

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 02:24

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		9.54		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		9.54		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		8.13		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		6.71		



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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 13:40

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 02:24

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.751	0.655-0.886	24-169 %	52.1	%	
<i>13C12-2,3,7,8-TCDD</i>		0.774	0.655-0.886	25-164 %	77.1	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.534	1.318-1.783	24-185 %	74.2	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.548	1.318-1.783	21-178 %	74.5	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.578	1.318-1.783	25-181 %	84.9	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.503	0.434-0.587	26-152 %	86.3	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.498	0.434-0.587	26-123 %	83.6	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.508	0.434-0.587	28-136 %	87.8	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.497	0.434-0.587	29-147 %	91.1	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.256	1.054-1.426	32-141 %	90.8	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.220	1.054-1.426	28-130 %	85.0	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.431	0.374-0.506	28-143 %	73.8	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.450	0.374-0.506	26-138 %	79.7	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.093	0.893-1.208	23-140 %	95.8	%	
<i>13C12-OCDD</i>		0.905	0.757-1.024	17-157 %	98.8	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	78.8	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 13:40  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-05  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	49.12	%	





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 14:30  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 03:14

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 25.9 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-07 A 01 Dry Weight: 10.00 g % Solids: 38.61
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleansed: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-07 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleansed: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-07 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleansed: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-07 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		1.068	0.655-0.886	0.14	1.00	<b>1.29</b>	ng/kg	EMPC, X
2,3,7,8-TCDD			0.655-0.886	0.11	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF		1.668	1.318-1.783	0.10	1.00	<b>0.77</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.311	1.318-1.783	0.10	1.00	<b>0.82</b>	ng/kg	EMPC, J
1,2,3,7,8-PeCDD		1.610	1.318-1.783	0.13	1.00	<b>1.95</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.250	1.054-1.426	0.09	1.00	<b>2.75</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.319	1.054-1.426	0.09	1.00	<b>1.77</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.303	1.054-1.426	0.09	1.00	<b>2.52</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.049	1.054-1.426	0.10	1.00	<b>0.70</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.125	1.054-1.426	0.15	1.00	<b>1.76</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.233	1.054-1.426	0.14	1.00	<b>10.1</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.273	1.054-1.426	0.16	1.00	<b>5.26</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.990	0.893-1.208	0.10	1.00	<b>45.3</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.057	0.893-1.208	0.15	1.00	<b>1.58</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.027	0.893-1.208	0.27	2.50	<b>161</b>	ng/kg	
OCDF		0.896	0.757-1.024	0.13	2.50	<b>48.9</b>	ng/kg	
OCDD		0.844	0.757-1.024	0.35	10.0	<b>1190</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>8.84</b>	ng/kg	
Total TCDD					1.00	<b>9.50</b>	ng/kg	
Total PeCDF					1.00	<b>22.4</b>	ng/kg	
Total PeCDD					1.00	<b>15.4</b>	ng/kg	
Total HxCDF					1.00	<b>62.2</b>	ng/kg	
Total HxCDD					1.00	<b>90.2</b>	ng/kg	
Total HpCDF					1.00	<b>107</b>	ng/kg	
Total HpCDD					1.00	<b>381</b>	ng/kg	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 14:30

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 03:14

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					7.34		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					7.28		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					7.12		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					6.84		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 14:30

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 03:14

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.749	0.655-0.886	24-169 %	47.5	%	
<i>13C12-2,3,7,8-TCDD</i>		0.758	0.655-0.886	25-164 %	67.7	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.535	1.318-1.783	24-185 %	68.8	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.570	1.318-1.783	21-178 %	70.4	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.615	1.318-1.783	25-181 %	78.6	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.496	0.434-0.587	26-152 %	78.4	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.491	0.434-0.587	26-123 %	74.5	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.507	0.434-0.587	28-136 %	78.9	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.503	0.434-0.587	29-147 %	85.9	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.235	1.054-1.426	32-141 %	82.9	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.209	1.054-1.426	28-130 %	74.6	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.449	0.374-0.506	28-143 %	67.0	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.485	0.374-0.506	26-138 %	73.3	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.089	0.893-1.208	23-140 %	86.7	%	
<i>13C12-OCDD</i>		0.888	0.757-1.024	17-157 %	92.8	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	71.2	%	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Extractions**

Method: ASTM D2216

Sampled: 11/28/2022 14:30

Instrument: N/A Analyst: TW

Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation:

Preparation Method: No Prep-Organics

Extract ID: 22K0553-07

Preparation Batch: BKL0002

Sample Size: 1 g (wet)

Prepared: 12/06/2022

Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	38.61	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKL0146-BLK1)</b>					Prepared: 13-Dec-2022		Analyzed: 19-Dec-2022 20:38				
2,3,7,8-TCDF		0.655-0.886	0.08	1.00	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.10	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.18	1.00	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.17	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.18	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.14	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.15	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF	1.331	0.893-1.208		1.00	0.29	ng/kg					EMPC, J
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.11	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD	1.502	0.893-1.208		2.50	0.58	ng/kg					EMPC, J
OCDF	1.023	0.757-1.024		2.50	1.80	ng/kg					J
OCDD	0.774	0.757-1.024		10.0	4.61	ng/kg					J
<b>Homologue group</b>											
Total TCDF				1.00	ND	ng/kg					U
Total TCDD				1.00	ND	ng/kg					U
Total PeCDF				1.00	ND	ng/kg					U
Total PeCDD				1.00	ND	ng/kg					U
Total HxCDF				1.00	0.16	ng/kg					J
Total HxCDD				1.00	ND	ng/kg					U
Total HpCDF				1.00	ND	ng/kg					U
Total HpCDD				1.00	ND	ng/kg					U

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.23  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.01  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC=ND): 0.22  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0 EDL, EMPC=ND): 0.00



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKL0146-BLK1)</b>											
						Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 20:38					
Labeled compounds											
13C12-2,3,7,8-TCDF	0.737	0.655-0.886			68.2					24-169 %	
13C12-2,3,7,8-TCDD	0.746	0.655-0.886			86.3					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.525	1.318-1.783			77.9					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.526	1.318-1.783			74.9					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			83.6					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.508	0.434-0.587			103					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.560	0.434-0.587			110					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.488	0.434-0.587			102					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.508	0.434-0.587			106					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.252	1.054-1.426			103					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.246	1.054-1.426			104					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.453	0.374-0.506			85.2					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.449	0.374-0.506			86.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	0.983	0.893-1.208			111					23-140 %	
13C12-OCDD	0.877	0.757-1.024			101					17-157 %	
37Cl4-2,3,7,8-TCDD					91.8					35-197 %	
<b>LCS (BKL0146-BS1)</b>											
						Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27					
2,3,7,8-TCDF	0.754	0.655-0.886		1.00	19.1	ng/kg	95.5	75-158 %			
2,3,7,8-TCDD	0.831	0.655-0.886		1.00	21.7	ng/kg	109	67-158 %			
1,2,3,7,8-PeCDF	1.544	1.318-1.783		1.00	104	ng/kg	104	80-134 %			
2,3,4,7,8-PeCDF	1.556	1.318-1.783		1.00	101	ng/kg	101	68-160 %			
1,2,3,7,8-PeCDD	1.483	1.318-1.783		1.00	115	ng/kg	115	70-142 %			
1,2,3,4,7,8-HxCDF	1.245	1.054-1.426		1.00	111	ng/kg	111	72-134 %			
1,2,3,6,7,8-HxCDF	1.247	1.054-1.426		1.00	120	ng/kg	120	84-130 %			
2,3,4,6,7,8-HxCDF	1.281	1.054-1.426		1.00	110	ng/kg	110	70-156 %			
1,2,3,7,8,9-HxCDF	1.214	1.054-1.426		1.00	105	ng/kg	105	78-130 %			
1,2,3,4,7,8-HxCDD	1.230	1.054-1.426		1.00	118	ng/kg	118	70-164 %			
1,2,3,6,7,8-HxCDD	1.117	1.054-1.426		1.00	114	ng/kg	114	76-134 %			
1,2,3,7,8,9-HxCDD	1.239	1.054-1.426		1.00	112	ng/kg	112	64-162 %			
1,2,3,4,6,7,8-HpCDF	0.971	0.893-1.208		1.00	108	ng/kg	108	82-122 %			
1,2,3,4,7,8,9-HpCDF	0.981	0.893-1.208		1.00	105	ng/kg	105	78-138 %			
1,2,3,4,6,7,8-HpCDD	1.041	0.893-1.208		2.50	114	ng/kg	114	70-140 %			
OCDF	0.906	0.757-1.024		2.50	175	ng/kg	87.6	63-170 %			
OCDD	0.835	0.757-1.024		10.0	222	ng/kg	111	78-144 %			





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

Labeled compounds

13C12-2,3,7,8-TCDF	0.745	0.655-0.886			35.2				24-169 %		
13C12-2,3,7,8-TCDD	0.751	0.655-0.886			62.0				25-164 %		
13C12-1,2,3,7,8-PeCDF	1.532	1.318-1.783			73.8				24-185 %		
13C12-2,3,4,7,8-PeCDF	1.530	1.318-1.783			70.9				21-178 %		
13C12-1,2,3,7,8-PeCDD	1.603	1.318-1.783			80.6				25-181 %		
13C12-1,2,3,4,7,8-HxCDF	0.497	0.434-0.587			94.0				26-152 %		
13C12-1,2,3,6,7,8-HxCDF	0.510	0.434-0.587			97.1				26-123 %		
13C12-2,3,4,6,7,8-HxCDF	0.500	0.434-0.587			95.4				28-136 %		
13C12-1,2,3,7,8,9-HxCDF	0.497	0.434-0.587			104				29-147 %		
13C12-1,2,3,4,7,8-HxCDD	1.248	1.054-1.426			95.6				32-141 %		
13C12-1,2,3,6,7,8-HxCDD	1.225	1.054-1.426			96.9				28-130 %		
13C12-1,2,3,4,6,7,8-HpCDF	0.435	0.374-0.506			80.0				28-143 %		
13C12-1,2,3,4,7,8,9-HpCDF	0.446	0.374-0.506			84.4				26-138 %		
13C12-1,2,3,4,6,7,8-HpCDD	1.061	0.893-1.208			100				23-140 %		
13C12-OCDD	0.895	0.757-1.024			97.4				17-157 %		
37Cl4-2,3,7,8-TCDD					65.7				35-197 %		

**LCS Dup (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

2,3,7,8-TCDF	0.699	0.655-0.886		1.00	18.6	ng/kg	93.0	75-158 %	2.64	25	
2,3,7,8-TCDD	0.791	0.655-0.886		1.00	20.8	ng/kg	104	67-158 %	4.29	25	
1,2,3,7,8-PeCDF	1.479	1.318-1.783		1.00	101	ng/kg	101	80-134 %	3.04	25	
2,3,4,7,8-PeCDF	1.536	1.318-1.783		1.00	102	ng/kg	102	68-160 %	0.13	25	
1,2,3,7,8-PeCDD	1.493	1.318-1.783		1.00	113	ng/kg	113	70-142 %	1.47	25	
1,2,3,4,7,8-HxCDF	1.214	1.054-1.426		1.00	110	ng/kg	110	72-134 %	0.87	25	
1,2,3,6,7,8-HxCDF	1.226	1.054-1.426		1.00	113	ng/kg	113	84-130 %	5.92	25	
2,3,4,6,7,8-HxCDF	1.215	1.054-1.426		1.00	105	ng/kg	105	70-156 %	4.88	25	
1,2,3,7,8,9-HxCDF	1.200	1.054-1.426		1.00	107	ng/kg	107	78-130 %	1.90	25	
1,2,3,4,7,8-HxCDD	1.205	1.054-1.426		1.00	117	ng/kg	117	70-164 %	0.52	25	
1,2,3,6,7,8-HxCDD	1.212	1.054-1.426		1.00	109	ng/kg	109	76-134 %	5.04	25	
1,2,3,7,8,9-HxCDD	1.194	1.054-1.426		1.00	112	ng/kg	112	64-162 %	0.06	25	
1,2,3,4,6,7,8-HpCDF	0.979	0.893-1.208		1.00	109	ng/kg	109	82-122 %	1.26	25	
1,2,3,4,7,8,9-HpCDF	0.974	0.893-1.208		1.00	109	ng/kg	109	78-138 %	3.62	25	
1,2,3,4,6,7,8-HpCDD	1.032	0.893-1.208		2.50	103	ng/kg	103	70-140 %	10.00	25	
OCDF	0.897	0.757-1.024		2.50	182	ng/kg	91.1	63-170 %	3.86	25	
OCDD	0.906	0.757-1.024		10.0	217	ng/kg	108	78-144 %	2.50	25	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS Dup (BKL0146-BSD1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

Labeled compounds											
13C12-2,3,7,8-TCDF	0.744	0.655-0.886			60.8					24-169 %	
13C12-2,3,7,8-TCDD	0.762	0.655-0.886			81.8					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.552	1.318-1.783			77.3					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.560	1.318-1.783			73.3					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			84.4					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.500	0.434-0.587			91.3					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.500	0.434-0.587			94.4					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.495	0.434-0.587			92.9					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.513	0.434-0.587			97.9					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.255	1.054-1.426			93.1					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.260	1.054-1.426			93.9					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.449	0.374-0.506			78.0					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.443	0.374-0.506			81.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1.031	0.893-1.208			102					23-140 %	
13C12-OCDD	0.938	0.757-1.024			98.7					17-157 %	
37Cl4-2,3,7,8-TCDD					82.5					35-197 %	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8290A in Solid</b>	
2,3,7,8-TCDF	DoD-ELAP,NELAP,WADOE
2,3,7,8-TCDD	NELAP,WADOE
1,2,3,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
2,3,4,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP,WADOE
OCDF	DoD-ELAP,NELAP,WADOE
OCDD	DoD-ELAP,NELAP,WADOE
Total TCDF	DoD-ELAP,NELAP,WADOE
Total TCDD	DoD-ELAP,NELAP,WADOE
Total PeCDF	DoD-ELAP,NELAP,WADOE
Total PeCDD	DoD-ELAP,NELAP,WADOE
Total HxCDF	DoD-ELAP,NELAP,WADOE
Total HxCDD	DoD-ELAP,NELAP,WADOE
Total HpCDF	DoD-ELAP,NELAP,WADOE
Total HpCDD	DoD-ELAP,NELAP,WADOE
13C12-2,3,7,8-TCDF	DoD-ELAP,NELAP
13C12-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDF	DoD-ELAP,NELAP
13C12-2,3,4,7,8-PeCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP



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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

13C12-1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP
13C12-OCDD	DoD-ELAP,NELAP
37Cl4-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,4-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

### Notes and Definitions

- \* Flagged value is not within established control limits.
- EMPC Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- X Indicates possible CDPE interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

February 2, 2023

Hannah Morse  
Pioneer Technologies Corporation  
5205 Corporate Center Ct SE, Suite C  
Lacey, WA 98503

Dear Hannah Morse:

Please find enclosed the analytical data report for the Solid Wood, Inc. project located in Olympia, Washington.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. The sample(s) will be disposed of within 30 days unless we are contacted to arrange long term storage.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

A handwritten signature in black ink, appearing to read "Sherry L. Chilcutt".

Sherry L. Chilcutt  
*Senior Chemist*  
*Libby Environmental, Inc.*



# Libby Environmental, Inc.

# Chain of Custody Record

www.LibbyEnvironmental.com

3322 South Bay Road NE

Ph: 360-352-2110

Olympia, WA 98506

Fax: 360-352-4154

Date:

Page: 1

of 1

Client: PIONEER Technologies Corporation

Project Manager: Hannah Morse

Address: 5205 Corporate Ctr Ct SE, Ste. A

Project Name: Solid Wood, Inc.

City: Olympia

State: WA

Zip: 98503

Location: 700 West Bay Dr NW City, State: Olympia, WA

Phone: 360 570 1700

Fax:

Collector: HM

Date of Collection: 11/29/22

Client Project #

Email: HMorseh@uspioneer.com



Sample Number	Depth	Time	Sample Type	Container Type	Analytes														Field Notes	
					VOC 8260	THM 8217 / PTHM 8218	PCB 8082	NWTPH-Gx	BTEX (8260)	NWTPH-HQD / (8021)	NWTPH-Dx / Dx	PCB 8088	THM 8217 / PTHM 8218	PAH 8270	PAH 8270	Semi Vol 8270	Phenol/Phenol 8270	TOC 8260A		Gain Size MP 85
1	WB-S0-SD64-0005	0.5'	0930	SD		X	X	X			X	X	X	X	X	X	X	X	X	
2	WB-S0-SD64-0020	2.0'	0855	SD		X		X			X	X	X	X	X	X	X	X	X	
3																				
4																				
5																				METALS:
6																				ARSENIC, CADMIUM,
7																				CHROMIUM,
8																				COPPER, LEAD,
9																				ZINC, SILVER
10																				
11																				
12																				
13																				
14																				
15																				
16																				
17																				

Relinquished by: <u>Hannah Morse</u>	Date / Time: <u>11/29/2022 4:04 PM</u>	Received by: <u>[Signature]</u>	Date / Time: <u>11-29-22 1604</u>	<b>Sample Receipt</b>		Remarks:
Relinquished by:	Date / Time:	Received by:	Date / Time:	Good Condition?	Y N	
Relinquished by:	Date / Time:	Received by:	Date / Time:	Cooler Temp.	°C	
Relinquished by:	Date / Time:	Received by:	Date / Time:	Sample Temp.	°C	
Relinquished by:	Date / Time:	Received by:	Date / Time:	Total Number of Containers		

TAT: 24HR 48HR **5-DAY**

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# Libby Environmental, Inc.

SOLID WOOD, INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K122

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Method	WB-SO- Blank	WB-SO- SD64-0005	WB-SO- SD64-0020
Date Sampled	Reporting	N/A	11/29/2022	11/29/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.18	nd	nd	nd
Chloromethane	0.18	nd	nd	nd
Vinyl chloride	0.06	nd	nd	nd
Bromomethane	0.27	nd	nd	nd
Chloroethane	0.18	nd	nd	nd
Trichlorofluoromethane	0.15	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd
Methylene chloride	0.06	nd	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.15	nd	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.09	nd	nd	nd
1,1-Dichloroethane	0.09	nd	nd	nd
2,2-Dichloropropane	0.15	nd	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.09	nd	nd	nd
Chloroform	0.09	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.09	nd	nd	nd
Carbon tetrachloride	0.09	nd	nd	nd
1,1-Dichloropropene	0.09	nd *	nd *	nd *
Benzene	0.06	nd	nd	nd
1,2-Dichloroethane (EDC)	0.09	nd	nd	nd
Trichloroethene (TCE)	0.06	nd	nd	nd
1,2-Dichloropropane	0.09	nd	nd	nd
Dibromomethane	0.12	nd	nd	nd
Bromodichloromethane	0.09	nd	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.09	nd	nd	nd
Toluene	0.30	nd	nd	nd
Trans-1,3-Dichloropropene	0.09	nd *	nd *	nd *
1,1,2-Trichloroethane	0.09	nd	nd	nd
Tetrachloroethene (PCE)	0.09	nd	nd	nd
1,3-Dichloropropane	0.15	nd	nd	nd
Dibromochloromethane	0.09	nd	nd	nd
1,2-Dibromoethane (EDB)	0.015	nd	nd	nd
Chlorobenzene	0.09	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.15	nd	nd	nd
Total Xylenes	0.45	nd	nd	nd
Styrene	0.09	nd	nd	nd

# Libby Environmental, Inc.

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 Olympia, Washington  
 Libby Project # L22K122

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 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Method	WB-SO- Blank	WB-SO- SD64-0005	WB-SO- SD64-0020
Date Sampled	Reporting	N/A	11/29/2022	11/29/2022
Date Analyzed	Limits	12/2/2022	12/2/2022	12/2/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Bromoform	0.45	nd	nd	nd
Isopropylbenzene	0.15	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.45	nd	nd	nd
Bromobenzene	0.12	nd	nd	nd
n-Propylbenzene	0.12	nd	nd	nd
1,2,3-Trichloropropane	0.12	nd	nd	nd
2-Chlorotoluene	0.12	nd	nd	nd
1,3,5-Trimethylbenzene	0.12	nd	nd	nd
4-Chlorotoluene	0.12	nd	nd	nd
tert-Butylbenzene	0.12	nd	nd	nd
1,2,4-Trimethylbenzene	0.12	nd	nd	nd
sec-Butylbenzene	0.12	nd	nd	nd
p-Isopropyltoluene	0.12	nd	nd	nd
1,3-Dichlorobenzene	0.12	nd	nd	nd
1,4-Dichlorobenzene	0.12	nd	nd	nd
n-Butylbenzene	0.12	nd	nd	nd
1,2-Dichlorobenzene	0.12	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.45	nd	nd	nd
1,2,4-Trichlorobenzene	0.45	nd	nd	nd
Hexachloro-1,3-butadiene	0.45	nd	nd	nd
Naphthalene	0.45	nd	nd	nd
1,2,3-Trichlorobenzene	0.45	nd	nd	nd
Surrogate Recovery	Acceptable Limits (%)			
Dibromofluoromethane	27-188	141	157	155
1,2-Dichloroethane-d4	17-212	112	117	118
Toluene-d8	41-142	84	86	83
4-Bromofluorobenzene	47-167	67	77	68

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

"\*" LCS Spike recovery is outside acceptance limits. Analyte concentration may be biased low.

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

SOLID WOOD, INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K122

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 Olympia, WA 98506  
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## QA/QC for Volatile Organic Compounds by EPA Method 8260D in Soil

Matrix Spike Sample Identification: L22K119-13								
Date Analyzed: 12/2/2022								
	Spiked Conc. (mg/kg)	MS Response (mg/kg)	MSD Response (mg/kg)	MS Recovery (%)	MSD Recovery (%)	RPD (%)	Recovery Limits (%)	Data Flag
Dichlorodifluoromethane	0.25	0.20	0.20	81	79	2.9	10-223	
Chloromethane	0.25	0.21	0.19	86	75	13.3	10-226	
Vinyl chloride	0.25	0.20	0.19	81	76	6.3	10-208	
Bromomethane	0.25	0.21	0.19	83	78	6.7	29-205	
Chloroethane	0.25	0.21	0.18	83	73	13.0	10-245	
Trichlorofluoromethane	0.25	0.27	0.30	109	119	8.8	10-238	
1,1-Dichloroethene	0.25	0.30	0.29	122	114	6.3	50-187	
Methylene chloride	0.25	0.25	0.26	101	103	1.5	15-237	
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.25	0.24	0.21	97	85	13.1	35-156	
<i>trans</i> -1,2-Dichloroethene	0.25	0.25	0.24	99	97	1.8	38-175	
1,1-Dichloroethane	0.25	0.30	0.28	121	111	8.6	67-164	
2,2-Dichloropropane	0.25	0.34	0.32	138	129	6.2	75-162	
<i>cis</i> -1,2-Dichloroethene	0.25	0.26	0.25	106	99	6.6	33-166	
Chloroform	0.25	0.34	0.32	136	129	5.2	18-225	
1,1,1-Trichloroethane (TCA)	0.25	0.46	0.41	182	164	10.3	73-162	S
Carbon tetrachloride	0.25	0.53	0.49	210	198	6.3	70-175	S
1,1-Dichloropropene	0.25	0.32	0.26	128	105	19.4	55-121	S
Benzene	0.25	0.27	0.28	109	114	4.4	65-126	
1,2-Dichloroethane (EDC)	0.25	0.33	0.29	131	117	10.8	66-147	
Trichloroethene (TCE)	0.25	0.30	0.29	121	114	5.8	71-126	
1,2-Dichloropropane	0.25	0.24	0.21	98	85	13.9	55-146	
Dibromomethane	0.25	0.41	0.36	166	143	14.8	67-153	S
Bromodichloromethane	0.25	0.51	0.44	205	175	15.4	75-157	S
<i>cis</i> -1,3-Dichloropropene	0.25	0.20	0.16	79	64	20.3	32-130	
Toluene	0.25	0.26	0.23	103	92	11.4	67-136	
Trans-1,3-Dichloropropene	0.25	0.18	0.16	70	66	6.5	51-115	
1,1,2-Trichloroethane	0.25	0.38	0.32	151	128	16.7	61-157	
Tetrachloroethene (PCE)	0.25	0.38	0.36	154	143	7.6	45-166	
1,3-Dichloropropane	0.25	0.24	0.21	98	84	14.8	51-133	
Dibromochloromethane	0.25	0.60	0.51	239	202	16.7	61-157	S
1,2-Dibromoethane (EDB)	0.25	0.35	0.31	139	123	11.6	52-149	
Chlorobenzene	0.25	0.32	0.30	127	120	5.4	69-148	
Ethylbenzene	0.25	0.20	0.19	81	78	4.2	55-140	
1,1,1,2-Tetrachloroethane	0.25	0.53	0.50	213	198	7.4	70-173	S
Total Xylenes	0.75	0.62	0.59	83	79	4.4	43-149	
Styrene	0.25	0.20	0.19	81	77	5.5	40-139	

# Libby Environmental, Inc.

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 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## QA/QC for Volatile Organic Compounds by EPA Method 8260D in Soil

Matrix Spike Sample Identification: L22K119-13								
Date Analyzed: 12/2/2022								
	Spiked Conc. (mg/kg)	MS Response (mg/kg)	MSD Response (mg/kg)	MS Recovery (%)	MSD Recovery (%)	RPD (%)	Recovery Limits (%)	Data Flag
Bromoform	0.25	0.88	0.76	353	303	15.3	16-220	S
Isopropylbenzene	0.25	0.18	0.17	71	69	3.3	31-151	
1,1,2,2-Tetrachloroethane	0.25	0.28	0.25	114	101	12.0	35-176	
Bromobenzene	0.25	0.25	0.26	102	102	0.2	65-138	
n-Propylbenzene	0.25	0.15	0.15	58	61	5.2	52-147	
1,2,3-Trichloropropane	0.25	0.30	0.28	121	111	9.3	48-172	
2-Chlorotoluene	0.25	0.15	0.16	60	62	4.2	53-138	
1,3,5-Trimethylbenzene	0.25	0.15	0.16	60	63	4.3	47-148	
4-Chlorotoluene	0.25	0.15	0.16	62	64	3.7	51-132	
tert-Butylbenzene	0.25	0.14	0.15	57	58	2.3	20-150	
1,2,4-Trimethylbenzene	0.25	0.14	0.15	58	60	4.6	47-144	
sec-Butylbenzene	0.25	0.17	0.16	67	65	2.7	49-147	
Isopropyltoluene	0.25	0.15	0.14	60	58	4.2	42-139	
1,3-Dichlorobenzene	0.25	0.28	0.28	112	110	1.1	68-143	
1,4-Dichlorobenzene	0.25	0.29	0.29	118	115	2.4	71-140	
n-Butylbenzene	0.25	0.13	0.12	51	47	7.6	38-148	
1,2-Dichlorobenzene	0.25	0.25	0.23	99	92	8.0	60-138	
1,2-Dibromo-3-Chloropropane	0.25	0.33	0.20	132	82	47.4	10-213	R
1,2,4-Trichlorobenzene	0.25	0.15	0.071	60	28	71.7	10-180	R
Hexachloro-1,3-butadiene	0.25	0.24	0.13	96	51	61.3	10-228	R
Naphthalene	0.25	0.10	0.10	42	40	5.8	10-180	
1,2,3-Trichlorobenzene	0.25	0.19	0.063	74	25	98.7	10-194	R

Surrogate Recovery (%)	MS	MSD	
Dibromofluoromethane	155	146	27-188
1,2-Dichloroethane-d4	126	116	17-212
Toluene-d8	86	81	41-142
4-Bromofluorobenzene	93	92	47-167

ACCEPTABLE RPD IS 35%

"S" Spike compound recovery is outside acceptance limits.

"R" High relative percent difference observed.

ANALYSES PERFORMED BY: Sherry Chilcutt



# Libby Environmental, Inc.

SOLID WOOD, INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K122

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Laboratory Control Sample

Date Analyzed: 12/2/2022					
	Spiked Conc. (mg/kg)	LCS Response (mg/kg)	LCS Recovery (%)	Recovery Limits (%)	Data Flag
Dichlorodifluoromethane	0.25	0.19	76	10-236	
Chloromethane	0.25	0.15	59	10-229	
Vinyl chloride	0.25	0.14	55	15-226	
Bromomethane	0.25	0.21	86	50-183	
Chloroethane	0.25	0.40	158	26-324	
Trichlorofluoromethane	0.25	0.30	120	79-209	
1,1-Dichloroethene	0.25	0.22	86	38-193	
Methylene chloride	0.25	0.20	81	51-199	
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.25	0.21	85	43-147	
<i>trans</i> -1,2-Dichloroethene	0.25	0.19	77	53-156	
1,1-Dichloroethane	0.25	0.24	95	68-169	
2,2-Dichloropropane	0.25	0.25	101	50-196	
<i>cis</i> -1,2-Dichloroethene	0.25	0.18	74	10-219	
Chloroform	0.25	0.28	112	47-192	
1,1,1-Trichloroethane (TCA)	0.25	0.31	123	67-173	
Carbon tetrachloride	0.25	0.32	127	69-170	
1,1-Dichloropropene	0.25	0.14	58	61-113	L
Benzene	0.25	0.18	73	65-118	
1,2-Dichloroethane (EDC)	0.25	0.24	96	67-138	
Trichloroethene (TCE)	0.25	0.24	97	67-121	
1,2-Dichloropropane	0.25	0.20	79	51-140	
Dibromomethane	0.25	0.31	125	64-140	
Bromodichloromethane	0.25	0.37	150	67-153	
<i>cis</i> -1,3-Dichloropropene	0.25	0.16	63	56-105	
Toluene	0.25	0.19	78	68-125	
Trans-1,3-Dichloropropene	0.25	0.15	60	63-109	L
1,1,2-Trichloroethane	0.25	0.29	118	65-152	
Tetrachloroethene (PCE)	0.25	0.30	119	46-159	
1,3-Dichloropropane	0.25	0.20	81	62-121	
Dibromochloromethane	0.25	0.42	170	48-181	
1,2-Dibromoethane (EDB)	0.25	0.29	116	53-146	
Chlorobenzene	0.25	0.27	108	62-151	
Ethylbenzene	0.25	0.18	74	49-144	
1,1,1,2-Tetrachloroethane	0.25	0.39	158	53-197	
Total Xylenes	0.75	0.53	70	38-140	
Styrene	0.25	0.18	70	52-134	

# Libby Environmental, Inc.

SOLID WOOD, INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K122

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Laboratory Control Sample

Date Analyzed: 12/2/2022					
	Spiked Conc. (mg/kg)	LCS Response (mg/kg)	LCS Recovery (%)	Recovery Limits (%)	Data Flag
Bromoform	0.25	0.65	261	29-218	S
Isopropylbenzene	0.25	0.16	65	58-136	
1,1,2,2-Tetrachloroethane	0.25	0.31	124	55-168	
Bromobenzene	0.25	0.29	117	74-120	
n-Propylbenzene	0.25	0.19	77	64-120	
1,2,3-Trichloropropane	0.25	0.34	138	62-153	
2-Chlorotoluene	0.25	0.19	76	67-120	
1,3,5-Trimethylbenzene	0.25	0.20	80	61-124	
4-Chlorotoluene	0.25	0.20	80	65-116	
tert-Butylbenzene	0.25	0.20	78	56-128	
1,2,4-Trimethylbenzene	0.25	0.19	76	62-122	
sec-Butylbenzene	0.25	0.23	92	68-130	
Isopropyltoluene	0.25	0.20	81	55-132	
1,3-Dichlorobenzene	0.25	0.33	130	75-133	
1,4-Dichlorobenzene	0.25	0.34	136	83-128	S
n-Butylbenzene	0.25	0.17	69	62-125	
1,2-Dichlorobenzene	0.25	0.30	120	73-129	
1,2-Dibromo-3-Chloropropane	0.25	0.35	141	33-155	
1,2,4-Trichlorobenzene	0.25	0.21	82	62-145	
Hexachloro-1,3-butadiene	0.25	0.40	159	37-220	
Naphthalene	0.25	0.14	56	50-133	
1,2,3-Trichlorobenzene	0.25	0.27	110	70-159	
Surrogate Recovery					
Dibromofluoromethane				27-188	
1,2-Dichloroethane-d4				17-212	
Toluene-d8				41-142	
4-Bromofluorobenzene				47-167	

"S" Spike compound recovery is outside acceptance limits (High Bias).

"L" Spike recovery is outside acceptance limits (Low Bias). Samples will be qualified with a \*.

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

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SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K122

## Analyses of Gasoline (NWTPH-Gx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)
Method Blank	12/2/2022	67	nd
WB-SO-SD64-0005	12/2/2022	77	nd
WB-SO-SD64-0020	12/2/2022	68	nd
Practical Quantitation Limit			30

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 41% TO 142%

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

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Olympia, WA 98506

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SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K122

## Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)	Oil (mg/kg)
Method Blank	12/1/2022	103	nd	nd
WB-SO-SD64-0005	12/1/2022	103	nd	nd
WB-SO-SD64-0005 Dup	12/1/2022	105	nd	nd
WB-SO-SD64-0020	12/1/2022	106	nd	nd
Practical Quantitation Limit			50	250

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Lucy Owens

# Libby Environmental, Inc.

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 Olympia, Washington  
 Libby Project # L22K122

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 Olympia, WA 98506  
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## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	Method Blank	LCS	WB-SO- SD64-0005	WB-SO- SD64-0005 Dup	WB-SO- SD64-0020
Date Sampled		N/A	N/A	11/29/2022	11/29/2022	11/29/2022
Date Analyzed		12/3/2022	12/3/2022	12/3/2022	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	nd	104%	nd	nd	nd
Aroclor 1221	0.1	nd		nd	nd	nd
Aroclor 1232	0.1	nd		nd	nd	nd
Aroclor 1242	0.1	nd		nd	nd	nd
Aroclor 1248	0.1	nd		nd	nd	nd
Aroclor 1254	0.1	nd		nd	nd	nd
Aroclor 1260	0.1	nd	99%	nd	nd	nd

### Surrogate Recovery

TCMX	105	101	88	123	109
DCBP	99	97	67	118	100

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Paul Burke

# Libby Environmental, Inc.

SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K122

3322 South Bay Road NE  
Olympia, WA 98506  
Phone: (360) 352-2110  
FAX: (360) 352-4154  
Email: libbyenv@gmail.com

## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	WB-SO- SD64-0005 MS	WB-SO- SD64-0005 MSD
Date Sampled		11/29/2022	11/29/2022
Date Analyzed		12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	106%	109%
Aroclor 1221	0.1		
Aroclor 1232	0.1		
Aroclor 1242	0.1		
Aroclor 1248	0.1		
Aroclor 1254	0.1		
Aroclor 1260	0.1	111%	109%

### Surrogate Recovery

TCMX	100	116
DCBP	91	97

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Paul Burke



# Libby Environmental, Inc.

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Olympia, WA 98506

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SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K122

## Analyses of Total Mercury in Soil by EPA Method 7471

Sample Number	Date Analyzed	Mercury (mg/kg)
Method Blank	12/1/2022	nd
WB-SO-SD64-0005	12/1/2022	nd
WB-SO-SD64-0020	12/1/2022	nd
Practical Quantitation Limit		0.5

"nd" Indicates not detected at the listed detection limits.

ANALYSES PERFORMED BY: Randolph Kraus

## QA/QC for Total Mercury by EPA Method 7471

Sample Number	Date Analyzed	Mercury (% Recovery)
LCS	12/1/2022	92%
L22K120-01 MS	12/1/2022	92%
L22K120-01 MSD	12/1/2022	96%
RPD		4%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Randolph Kraus

# Libby Environmental, Inc.

3322 South Bay Road NE

Olympia, WA 98506

Phone: (360) 352-2110

FAX: (360) 352-4154

Email: libbyenv@gmail.com

SOLID WOOD, INC. PROJECT  
Pioneer Technologies Corp.  
Libby Project # L22K122  
Date Received 11/29/22 16:04

Received By RJK

## Sample Receipt Checklist

### Chain of Custody

1. Is the Chain of Custody complete?  Yes  No
2. How was the sample delivered?  Hand Delivered  Picked Up  Shipped

### Log In

3. Cooler or Shipping Container is present.  Yes  No  N/A
4. Cooler or Shipping Container is in good condition.  Yes  No  N/A
5. Cooler or Shipping Container has Custody Seals present.  Yes  No  N/A
6. Was an attempt made to cool the samples?  Yes  No  N/A
7. Temperature of cooler (0°C to 8°C recommended) -3.1 °C
8. Temperature of sample(s) (0°C to 8°C recommended) 1.1 °C
9. Did all containers arrive in good condition (unbroken)?  Yes  No
10. Is it clear what analyses were requested?  Yes  No
11. Did container labels match Chain of Custody?  Yes  No
12. Are matrices correctly identified on Chain of Custody?  Yes  No
13. Are correct containers used for the analysis indicated?  Yes  No
14. Is there sufficient sample volume for indicated analysis?  Yes  No
15. Were all containers properly preserved per each analysis?  Yes  No
16. Were VOA vials collected correctly (no headspace)?  Yes  No  N/A
17. Were all holding times able to be met?  Yes  No

### Discrepancies/ Notes

18. Was client notified of all discrepancies?  Yes  No  N/A

Person Notified: \_\_\_\_\_

Date: \_\_\_\_\_

By Whom: \_\_\_\_\_

Via: \_\_\_\_\_

Regarding: \_\_\_\_\_

19. Comments. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_



3600 Fremont Ave. N.  
Seattle, WA 98103  
T: (206) 352-3790  
F: (206) 352-7178  
info@fremontanalytical.com

**Libby Environmental**  
Sherry Chilcutt  
3322 South Bay Road NE  
Olympia, WA 98506

**RE: Solid Wood Inc.**  
**Work Order Number: 2211613**

February 01, 2023

**Attention Sherry Chilcutt:**

Fremont Analytical, Inc. received 2 sample(s) on 11/30/2022 for the analyses presented in the following report.

***Grain Size by ASTM D422***  
***Sample Moisture (Percent Moisture)***  
***Semivolatile Organic Compounds by EPA Method 8270***  
***Total Metals by EPA Method 6020B***  
***Total Organic Carbon by EPA 9060***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing  
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing  
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

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Original



Date: 02/01/2023

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**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.  
**Work Order:** 2211613

## Work Order Sample Summary

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Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2211613-001	WB-SO-SD64-0005	11/29/2022 8:29 AM	11/30/2022 11:42 AM
2211613-002	WB-SO-SD64-0020	11/29/2022 8:55 AM	11/30/2022 11:42 AM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

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**CLIENT:** Libby Environmental**Project:** Solid Wood Inc.

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**I. SAMPLE RECEIPT:**

Samples receipt information is recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

2211613-001B

PHY-GRAIN has been Sub Contracted.

2211613-002B

PHY-GRAIN has been Sub Contracted.

### Qualifiers:

- \* - Associated LCS is outside of control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Method Detection Limit
- R - High relative percent difference observed

### Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate





# Analytical Report

Work Order: 2211613  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/29/2022 8:29:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2211613-001

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD64-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	283	41.6	11.0		µg/Kg-dry	1	12/14/22 8:59:24
Bis(2-chloroethyl) ether	ND	69.4	21.3		µg/Kg-dry	1	12/14/22 8:59:24
2-Chlorophenol	ND	55.5	20.0		µg/Kg-dry	1	12/14/22 8:59:24
1,3-Dichlorobenzene	ND	55.5	22.7		µg/Kg-dry	1	12/14/22 8:59:24
1,4-Dichlorobenzene	ND	41.6	17.9		µg/Kg-dry	1	12/14/22 8:59:24
1,2-Dichlorobenzene	ND	55.5	18.4		µg/Kg-dry	1	12/14/22 8:59:24
Benzyl alcohol	ND	208	79.9	Q	µg/Kg-dry	1	12/14/22 8:59:24
2-Methylphenol (o-cresol)	ND	55.5	21.6		µg/Kg-dry	1	12/14/22 8:59:24
Hexachloroethane	ND	55.5	17.5		µg/Kg-dry	1	12/14/22 8:59:24
N-Nitrosodi-n-propylamine	ND	111	38.1		µg/Kg-dry	1	12/14/22 8:59:24
3&4-Methylphenol (m, p-cresol)	ND	41.6	17.9		µg/Kg-dry	1	12/14/22 8:59:24
Nitrobenzene	ND	69.4	21.2		µg/Kg-dry	1	12/14/22 8:59:24
Isophorone	ND	55.5	18.1		µg/Kg-dry	1	12/14/22 8:59:24
2-Nitrophenol	ND	41.6	17.8		µg/Kg-dry	1	12/14/22 8:59:24
2,4-Dimethylphenol	ND	41.6	8.13		µg/Kg-dry	1	12/14/22 8:59:24
Bis(2-chloroethoxy)methane	ND	41.6	7.86		µg/Kg-dry	1	12/14/22 8:59:24
2,4-Dichlorophenol	ND	41.6	6.12		µg/Kg-dry	1	12/14/22 8:59:24
1,2,4-Trichlorobenzene	ND	41.6	15.6		µg/Kg-dry	1	12/14/22 8:59:24
Naphthalene	ND	55.5	17.0		µg/Kg-dry	1	12/14/22 8:59:24
4-Chloroaniline	ND	41.6	12.4		µg/Kg-dry	1	12/14/22 8:59:24
Hexachlorobutadiene	ND	41.6	12.1		µg/Kg-dry	1	12/14/22 8:59:24
4-Chloro-3-methylphenol	ND	41.6	15.8	Q	µg/Kg-dry	1	12/14/22 8:59:24
2-Methylnaphthalene	ND	41.6	10.2		µg/Kg-dry	1	12/14/22 8:59:24
1-Methylnaphthalene	ND	41.6	7.12		µg/Kg-dry	1	12/14/22 8:59:24
Hexachlorocyclopentadiene	ND	139	30.8	Q	µg/Kg-dry	1	12/14/22 8:59:24
2,4,6-Trichlorophenol	ND	41.6	17.6		µg/Kg-dry	1	12/14/22 8:59:24
2,4,5-Trichlorophenol	ND	41.6	12.3		µg/Kg-dry	1	12/14/22 8:59:24
2-Chloronaphthalene	ND	41.6	8.81		µg/Kg-dry	1	12/14/22 8:59:24
2-Nitroaniline	ND	69.4	27.6		µg/Kg-dry	1	12/14/22 8:59:24
Acenaphthene	ND	41.6	9.70		µg/Kg-dry	1	12/14/22 8:59:24
Dimethylphthalate	ND	4,860	2,240		µg/Kg-dry	1	12/14/22 8:59:24

Original



# Analytical Report

Work Order: 2211613  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc.  
**Lab ID:** 2211613-001  
**Client Sample ID:** WB-SO-SD64-0005

**Collection Date:** 11/29/2022 8:29:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
2,6-Dinitrotoluene	ND	55.5	20.1		µg/Kg-dry	1	12/14/22 8:59:24
Acenaphthylene	ND	41.6	8.70		µg/Kg-dry	1	12/14/22 8:59:24
2,4-Dinitrophenol	ND	416	179	Q	µg/Kg-dry	1	12/14/22 8:59:24
Dibenzofuran	ND	41.6	8.30		µg/Kg-dry	1	12/14/22 8:59:24
2,4-Dinitrotoluene	ND	83.3	33.7		µg/Kg-dry	1	12/14/22 8:59:24
4-Nitrophenol	ND	278	74.9	Q	µg/Kg-dry	1	12/14/22 8:59:24
Fluorene	ND	41.6	6.94		µg/Kg-dry	1	12/14/22 8:59:24
4-Chlorophenyl phenyl ether	ND	41.6	11.3		µg/Kg-dry	1	12/14/22 8:59:24
Diethylphthalate	ND	1,040	334		µg/Kg-dry	1	12/14/22 8:59:24
4,6-Dinitro-2-methylphenol	ND	347	152		µg/Kg-dry	1	12/14/22 8:59:24
4-Bromophenyl phenyl ether	ND	41.6	16.4		µg/Kg-dry	1	12/14/22 8:59:24
Hexachlorobenzene	ND	41.6	8.12		µg/Kg-dry	1	12/14/22 8:59:24
Pentachlorophenol	ND	278	99.5	Q	µg/Kg-dry	1	12/14/22 8:59:24
Phenanthrene	ND	41.6	11.0		µg/Kg-dry	1	12/14/22 8:59:24
Anthracene	ND	41.6	7.69		µg/Kg-dry	1	12/14/22 8:59:24
Carbazole	ND	41.6	8.97		µg/Kg-dry	1	12/14/22 8:59:24
Di-n-butylphthalate	ND	41.6	15.0		µg/Kg-dry	1	12/14/22 8:59:24
Fluoranthene	19.3	41.6	12.2	J	µg/Kg-dry	1	12/14/22 8:59:24
Pyrene	ND	208	66.4		µg/Kg-dry	1	12/14/22 8:59:24
Butyl Benzylphthalate	ND	69.4	20.4		µg/Kg-dry	1	12/14/22 8:59:24
bis(2-Ethylhexyl)adipate	ND	278	102		µg/Kg-dry	1	12/14/22 8:59:24
Benz(a)anthracene	ND	41.6	11.2		µg/Kg-dry	1	12/14/22 8:59:24
Chrysene	ND	69.4	16.0		µg/Kg-dry	1	12/14/22 8:59:24
bis (2-Ethylhexyl) phthalate	ND	55.5	15.6	Q	µg/Kg-dry	1	12/14/22 8:59:24
Di-n-octyl phthalate	ND	104	25.9		µg/Kg-dry	1	12/14/22 8:59:24
Benzo(b)fluoranthene	ND	139	14.7		µg/Kg-dry	1	12/14/22 8:59:24
Benzo(k)fluoranthene	ND	41.6	13.9		µg/Kg-dry	1	12/14/22 8:59:24
Benzo(a)pyrene	ND	55.5	20.2		µg/Kg-dry	1	12/14/22 8:59:24
Indeno(1,2,3-cd)pyrene	ND	278	95.9	Q	µg/Kg-dry	1	12/14/22 8:59:24
Dibenz(a,h)anthracene	ND	139	54.0		µg/Kg-dry	1	12/14/22 8:59:24
Benzo(g,h,i)perylene	ND	139	40.2	Q*	µg/Kg-dry	1	12/14/22 8:59:24

Original



# Analytical Report

Work Order: 2211613  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc.  
**Lab ID:** 2211613-001  
**Client Sample ID:** WB-SO-SD64-0005

**Collection Date:** 11/29/2022 8:29:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724 Analyst: SK

Surr: 2,4,6-Tribromophenol	75.7	16.2 - 150	0		%Rec	1	12/14/22 8:59:24
Surr: 2-Fluorobiphenyl	77.5	25.3 - 139	0		%Rec	1	12/14/22 8:59:24
Surr: Nitrobenzene-d5	69.8	12.7 - 143	0		%Rec	1	12/14/22 8:59:24
Surr: Phenol-d6	68.7	21.4 - 139	0		%Rec	1	12/14/22 8:59:24
Surr: p-Terphenyl	76.2	37.1 - 144	0		%Rec	1	12/14/22 8:59:24

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685 Analyst: EH

Arsenic	4.32	0.355	0.104		mg/Kg-dry	1	12/02/22 17:06:02
Cadmium	0.340	0.236	0.00901		mg/Kg-dry	1	12/02/22 17:06:02
Chromium	20.5	0.650	0.155		mg/Kg-dry	1	12/02/22 17:06:02
Copper	18.4	1.30	0.221		mg/Kg-dry	1	12/02/22 17:06:02
Lead	4.18	0.355	0.0492		mg/Kg-dry	1	12/02/22 17:06:02
Silver	0.0713	0.118	0.0244	J	mg/Kg-dry	1	12/02/22 17:06:02
Zinc	43.4	2.07	0.721		mg/Kg-dry	1	12/02/22 17:06:02

**Sample Moisture (Percent Moisture)**

Batch ID: R80248 Analyst: CO

Percent Moisture	36.9	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38840 Analyst: AT

Total Organic Carbon	1.42	0.150	0.0412		%-dry	1	12/14/22 14:56:00
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# Analytical Report

Work Order: 2211613  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/29/2022 8:55:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2211613-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD64-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38724		Analyst: SK		
Phenol	ND	51.1	13.5		µg/Kg-dry	1	12/14/22 9:29:20
Bis(2-chloroethyl) ether	ND	85.2	26.1		µg/Kg-dry	1	12/14/22 9:29:20
2-Chlorophenol	ND	68.1	24.6		µg/Kg-dry	1	12/14/22 9:29:20
1,3-Dichlorobenzene	ND	68.1	27.9		µg/Kg-dry	1	12/14/22 9:29:20
1,4-Dichlorobenzene	ND	51.1	22.0		µg/Kg-dry	1	12/14/22 9:29:20
1,2-Dichlorobenzene	ND	68.1	22.6		µg/Kg-dry	1	12/14/22 9:29:20
Benzyl alcohol	ND	256	98.0	Q	µg/Kg-dry	1	12/14/22 9:29:20
2-Methylphenol (o-cresol)	ND	68.1	26.6		µg/Kg-dry	1	12/14/22 9:29:20
Hexachloroethane	ND	68.1	21.4		µg/Kg-dry	1	12/14/22 9:29:20
N-Nitrosodi-n-propylamine	ND	136	46.8		µg/Kg-dry	1	12/14/22 9:29:20
3&4-Methylphenol (m, p-cresol)	32.2	51.1	22.0	J	µg/Kg-dry	1	12/14/22 9:29:20
Nitrobenzene	ND	85.2	26.0		µg/Kg-dry	1	12/14/22 9:29:20
Isophorone	ND	68.1	22.2		µg/Kg-dry	1	12/14/22 9:29:20
2-Nitrophenol	ND	51.1	21.8		µg/Kg-dry	1	12/14/22 9:29:20
2,4-Dimethylphenol	ND	51.1	9.98		µg/Kg-dry	1	12/14/22 9:29:20
Bis(2-chloroethoxy)methane	ND	51.1	9.65		µg/Kg-dry	1	12/14/22 9:29:20
2,4-Dichlorophenol	ND	51.1	7.51		µg/Kg-dry	1	12/14/22 9:29:20
1,2,4-Trichlorobenzene	ND	51.1	19.1		µg/Kg-dry	1	12/14/22 9:29:20
Naphthalene	21.5	68.1	20.8	J	µg/Kg-dry	1	12/14/22 9:29:20
4-Chloroaniline	ND	51.1	15.2		µg/Kg-dry	1	12/14/22 9:29:20
Hexachlorobutadiene	ND	51.1	14.8		µg/Kg-dry	1	12/14/22 9:29:20
4-Chloro-3-methylphenol	ND	51.1	19.4	Q	µg/Kg-dry	1	12/14/22 9:29:20
2-Methylnaphthalene	ND	51.1	12.5		µg/Kg-dry	1	12/14/22 9:29:20
1-Methylnaphthalene	ND	51.1	8.74		µg/Kg-dry	1	12/14/22 9:29:20
Hexachlorocyclopentadiene	ND	170	37.8	Q	µg/Kg-dry	1	12/14/22 9:29:20
2,4,6-Trichlorophenol	ND	51.1	21.6		µg/Kg-dry	1	12/14/22 9:29:20
2,4,5-Trichlorophenol	ND	51.1	15.1		µg/Kg-dry	1	12/14/22 9:29:20
2-Chloronaphthalene	ND	51.1	10.8		µg/Kg-dry	1	12/14/22 9:29:20
2-Nitroaniline	ND	85.2	33.8		µg/Kg-dry	1	12/14/22 9:29:20
Acenaphthene	ND	51.1	11.9		µg/Kg-dry	1	12/14/22 9:29:20
Dimethylphthalate	ND	5,960	2,750		µg/Kg-dry	1	12/14/22 9:29:20

Original



# Analytical Report

Work Order: 2211613  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/29/2022 8:55:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2211613-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD64-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

2,6-Dinitrotoluene	ND	68.1	24.6		µg/Kg-dry	1	12/14/22 9:29:20
Acenaphthylene	ND	51.1	10.7		µg/Kg-dry	1	12/14/22 9:29:20
2,4-Dinitrophenol	ND	511	220	Q	µg/Kg-dry	1	12/14/22 9:29:20
Dibenzofuran	ND	51.1	10.2		µg/Kg-dry	1	12/14/22 9:29:20
2,4-Dinitrotoluene	ND	102	41.3		µg/Kg-dry	1	12/14/22 9:29:20
4-Nitrophenol	ND	341	91.9	Q	µg/Kg-dry	1	12/14/22 9:29:20
Fluorene	ND	51.1	8.52		µg/Kg-dry	1	12/14/22 9:29:20
4-Chlorophenyl phenyl ether	ND	51.1	13.8		µg/Kg-dry	1	12/14/22 9:29:20
Diethylphthalate	ND	1,280	410		µg/Kg-dry	1	12/14/22 9:29:20
4,6-Dinitro-2-methylphenol	ND	426	187		µg/Kg-dry	1	12/14/22 9:29:20
4-Bromophenyl phenyl ether	ND	51.1	20.1		µg/Kg-dry	1	12/14/22 9:29:20
Hexachlorobenzene	ND	51.1	9.97		µg/Kg-dry	1	12/14/22 9:29:20
Pentachlorophenol	ND	341	122	Q	µg/Kg-dry	1	12/14/22 9:29:20
Phenanthrene	32.9	51.1	13.5	J	µg/Kg-dry	1	12/14/22 9:29:20
Anthracene	ND	51.1	9.44		µg/Kg-dry	1	12/14/22 9:29:20
Carbazole	ND	51.1	11.0		µg/Kg-dry	1	12/14/22 9:29:20
Di-n-butylphthalate	ND	51.1	18.4		µg/Kg-dry	1	12/14/22 9:29:20
Fluoranthene	62.0	51.1	15.0		µg/Kg-dry	1	12/14/22 9:29:20
Pyrene	ND	256	81.5		µg/Kg-dry	1	12/14/22 9:29:20
Butyl Benzylphthalate	ND	85.2	25.1		µg/Kg-dry	1	12/14/22 9:29:20
bis(2-Ethylhexyl)adipate	ND	341	125		µg/Kg-dry	1	12/14/22 9:29:20
Benz(a)anthracene	22.7	51.1	13.8	J	µg/Kg-dry	1	12/14/22 9:29:20
Chrysene	28.2	85.2	19.6	J	µg/Kg-dry	1	12/14/22 9:29:20
bis (2-Ethylhexyl) phthalate	ND	68.1	19.2	Q	µg/Kg-dry	1	12/14/22 9:29:20
Di-n-octyl phthalate	ND	128	31.8		µg/Kg-dry	1	12/14/22 9:29:20
Benzo(b)fluoranthene	ND	170	18.0		µg/Kg-dry	1	12/14/22 9:29:20
Benzo(k)fluoranthene	ND	51.1	17.1		µg/Kg-dry	1	12/14/22 9:29:20
Benzo(a)pyrene	ND	68.1	24.8		µg/Kg-dry	1	12/14/22 9:29:20
Indeno(1,2,3-cd)pyrene	ND	341	118	Q	µg/Kg-dry	1	12/14/22 9:29:20
Dibenz(a,h)anthracene	ND	170	66.3		µg/Kg-dry	1	12/14/22 9:29:20
Benzo(g,h,i)perylene	ND	170	49.3	Q*	µg/Kg-dry	1	12/14/22 9:29:20

Original



# Analytical Report

Work Order: 2211613  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/29/2022 8:55:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2211613-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD64-0020

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38724

Analyst: SK

Surr: 2,4,6-Tribromophenol	77.7	16.2 - 150	0		%Rec	1	12/14/22 9:29:20
Surr: 2-Fluorobiphenyl	79.1	25.3 - 139	0		%Rec	1	12/14/22 9:29:20
Surr: Nitrobenzene-d5	71.8	12.7 - 143	0		%Rec	1	12/14/22 9:29:20
Surr: Phenol-d6	67.9	21.4 - 139	0		%Rec	1	12/14/22 9:29:20
Surr: p-Terphenyl	79.3	37.1 - 144	0		%Rec	1	12/14/22 9:29:20

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724B). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38685

Analyst: EH

Arsenic	6.21	0.417	0.122		mg/Kg-dry	1	12/02/22 17:08:45
Cadmium	0.455	0.278	0.0106		mg/Kg-dry	1	12/02/22 17:08:45
Chromium	24.9	0.764	0.182		mg/Kg-dry	1	12/02/22 17:08:45
Copper	27.8	1.53	0.260		mg/Kg-dry	1	12/02/22 17:08:45
Lead	7.75	0.417	0.0578		mg/Kg-dry	1	12/02/22 17:08:45
Silver	0.117	0.139	0.0286	J	mg/Kg-dry	1	12/02/22 17:08:45
Zinc	57.0	2.43	0.847		mg/Kg-dry	1	12/02/22 17:08:45

**Sample Moisture (Percent Moisture)**

Batch ID: R80248

Analyst: CO

Percent Moisture	44.6	0.500	0.100		wt%	1	12/05/22 11:10:52
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**Total Organic Carbon by EPA 9060**

Batch ID: 38840

Analyst: AT

Total Organic Carbon	1.86	0.150	0.0412		%-dry	1	12/14/22 15:12:00
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Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Organic Carbon by EPA 9060**

Sample ID: <b>MB-38840</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38840</b>	Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664076</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.150									

Sample ID: <b>LCS-38840</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38840</b>	Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664077</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	1.07	0.150	1.000	0	107	80	120				

Sample ID: <b>2211613-002ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>WB-SO-SD64-0020</b>	Batch ID: <b>38840</b>	Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664084</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.13	0.150						1.856	13.8	20	

Sample ID: <b>2211613-002AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>WB-SO-SD64-0020</b>	Batch ID: <b>38840</b>	Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664085</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.70	0.150	1.000	1.856	84.6	75	125				

Sample ID: <b>2211613-002AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80496</b>							
Client ID: <b>WB-SO-SD64-0020</b>	Batch ID: <b>38840</b>	Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1664086</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.78	0.150	1.000	1.856	92.8	75	125	2.702	2.99	20	

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>MB-38685</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38685</b>		Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657277</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	ND	0.240									
Cadmium	ND	0.160									
Chromium	ND	0.440									
Copper	ND	0.880									
Lead	ND	0.240									
Silver	ND	0.0800									
Zinc	ND	1.40									

Sample ID: <b>LCS-38685</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38685</b>		Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657278</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	36.9	0.236	39.37	0	93.8	80	120				
Cadmium	1.94	0.157	1.969	0	98.3	80	120				
Chromium	35.4	0.433	39.37	0	89.8	80	120				
Copper	38.8	0.866	39.37	0	98.5	80	120				
Lead	21.3	0.236	19.69	0	108	80	120				
Silver	1.97	0.0787	1.969	0	100	80	120				
Zinc	37.3	1.38	39.37	0	94.8	80	120				

Sample ID: <b>2211536-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>		Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657281</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Arsenic	60.3	0.231	38.42	30.87	76.5	75	125				I
Cadmium	2.01	0.154	1.921	0.2830	90.0	75	125				I
Chromium	85.9	0.423	38.42	62.95	59.8	75	125				SI
Copper	183	0.845	38.42	186.0	-6.70	75	125				SI
Lead	36.4	0.231	19.21	24.00	64.7	75	125				SI
Silver	2.39	0.0768	1.921	1.081	68.1	75	125				SI
Zinc	840	1.34	38.42	950.5	-287	75	125				ESI

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>2211536-001AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>	Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657281</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

**NOTES:**

S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.  
 I - Internal standards were outside of acceptance criteria. Re-analysis and/or matrix spike samples yielded the same result indicating a possible matrix effect.

Sample ID: <b>2211536-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>	Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657282</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	54.3	0.231	38.42	30.87	60.9	75	125	60.26	10.4	20	SI
Cadmium	1.79	0.154	1.921	0.2830	78.5	75	125	2.012	11.6	20	I
Chromium	76.0	0.423	38.42	62.95	34.0	75	125	85.94	12.2	20	SI
Copper	166	0.845	38.42	186.0	-51.0	75	125	183.4	9.74	20	SI
Lead	32.0	0.231	19.21	24.00	41.5	75	125	36.43	13.0	20	SI
Silver	2.18	0.0768	1.921	1.081	57.0	75	125	2.389	9.36	20	SI
Zinc	768	1.34	38.42	950.5	-474	75	125	840.3	8.93	20	ESI

**NOTES:**

S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.  
 I - Internal standards were outside of acceptance criteria. Re-analysis and/or matrix spike samples yielded the same result indicating a possible matrix effect.

Sample ID: <b>2211536-001APDS</b>	SampType: <b>PDS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/1/2022</b>	RunNo: <b>80242</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38685</b>	Analysis Date: <b>12/2/2022</b>	SeqNo: <b>1657283</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	73.5	0.231	38.4	30.9	111	75	125				I
Cadmium	2.48	0.154	1.92	0.283	114	75	125				I
Chromium	106	0.423	38.4	63.0	113	75	125				I
Copper	219	0.845	38.4	186	86.4	75	125				EI
Lead	45.1	0.231	19.2	24.0	110	75	125				I
Silver	2.83	0.0768	1.92	1.08	91.3	75	125				I
Zinc	1,000	1.34	38.4	950	132	75	125				ESI

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724A</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>			Prep Date: <b>12/13/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1668259</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	945	30.0	1,000	0	94.5	80	120				
Bis(2-chloroethyl) ether	903	50.0	1,000	0	90.3	80	120				
2-Chlorophenol	877	40.0	1,000	0	87.7	80	120				
1,3-Dichlorobenzene	923	40.0	1,000	0	92.3	80	120				
1,4-Dichlorobenzene	915	30.0	1,000	0	91.5	80	120				
1,2-Dichlorobenzene	924	40.0	1,000	0	92.4	80	120				
Benzyl alcohol	54.4	50.0	1,000	0	5.44	80	120				S
2-Methylphenol (o-cresol)	831	40.0	1,000	0	83.1	80	120				
Hexachloroethane	935	40.0	1,000	0	93.5	80	120				
N-Nitrosodi-n-propylamine	840	80.0	1,000	0	84.0	80	120				
3&4-Methylphenol (m, p-cresol)	786	30.0	1,000	0	78.6	80	120				S
Nitrobenzene	917	50.0	1,000	0	91.7	80	120				
Isophorone	861	40.0	1,000	0	86.1	80	120				
2-Nitrophenol	1,030	30.0	1,000	0	103	80	120				
2,4-Dimethylphenol	804	30.0	1,000	0	80.4	80	120				
Bis(2-chloroethoxy)methane	896	30.0	1,000	0	89.6	80	120				
2,4-Dichlorophenol	817	30.0	1,000	0	81.7	80	120				
1,2,4-Trichlorobenzene	917	30.0	1,000	0	91.7	80	120				
Naphthalene	923	40.0	1,000	0	92.3	80	120				
4-Chloroaniline	815	30.0	1,000	0	81.5	80	120				
Hexachlorobutadiene	979	30.0	1,000	0	97.9	80	120				
4-Chloro-3-methylphenol	723	30.0	1,000	0	72.3	80	120				S
2-Methylnaphthalene	891	30.0	1,000	0	89.1	80	120				
1-Methylnaphthalene	894	30.0	1,000	0	89.4	80	120				
Hexachlorocyclopentadiene	994	100	1,000	0	99.4	80	120				
2,4,6-Trichlorophenol	889	30.0	1,000	0	88.9	80	120				
2,4,5-Trichlorophenol	847	30.0	1,000	0	84.7	80	120				
2-Chloronaphthalene	879	30.0	1,000	0	87.9	80	120				
2-Nitroaniline	866	50.0	1,000	0	86.6	80	120				
Acenaphthene	898	30.0	1,000	0	89.8	80	120				
Dimethylphthalate	875	800	1,000	0	87.5	80	120				
2,6-Dinitrotoluene	916	40.0	1,000	0	91.6	80	120				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724A</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1668259</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Acenaphthylene	901	30.0	1,000	0	90.1	80	120				
2,4-Dinitrophenol	1,780	300	2,000	0	89.0	80	120				
Dibenzofuran	880	30.0	1,000	0	88.0	80	120				
2,4-Dinitrotoluene	848	60.0	1,000	0	84.8	80	120				
4-Nitrophenol	744	200	1,000	0	74.4	80	120				S
Fluorene	879	30.0	1,000	0	87.9	80	120				
4-Chlorophenyl phenyl ether	914	30.0	1,000	0	91.4	80	120				
Diethylphthalate	820	750	1,000	0	82.0	80	120				
4,6-Dinitro-2-methylphenol	852	250	1,000	0	85.2	80	120				
4-Bromophenyl phenyl ether	913	30.0	1,000	0	91.3	80	120				
Hexachlorobenzene	911	30.0	1,000	0	91.1	80	120				
Pentachlorophenol	885	200	1,000	0	88.5	80	120				
Phenanthrene	892	30.0	1,000	0	89.2	80	120				
Anthracene	879	30.0	1,000	0	87.9	80	120				
Carbazole	839	30.0	1,000	0	83.9	80	120				
Di-n-butylphthalate	871	30.0	1,000	0	87.1	80	120				
Fluoranthene	882	30.0	1,000	0	88.2	80	120				
Pyrene	877	150	1,000	0	87.7	80	120				
Butyl Benzylphthalate	867	50.0	1,000	0	86.7	80	120				
bis(2-Ethylhexyl)adipate	827	200	1,000	0	82.7	80	120				
Benz(a)anthracene	882	30.0	1,000	0	88.2	80	120				
Chrysene	884	50.0	1,000	0	88.4	80	120				
bis (2-Ethylhexyl) phthalate	802	40.0	1,000	0	80.2	80	120				
Di-n-octyl phthalate	812	75.0	1,000	0	81.2	80	120				
Benzo(b)fluoranthene	851	100	1,000	0	85.1	80	120				
Benzo(k)fluoranthene	985	30.0	1,000	0	98.5	80	120				
Benzo(a)pyrene	857	40.0	1,000	0	85.7	80	120				
Indeno(1,2,3-cd)pyrene	885	200	1,000	0	88.5	80	120				
Dibenz(a,h)anthracene	907	100	1,000	0	90.7	80	120				
Benzo(g,h,i)perylene	853	100	1,000	0	85.3	80	120				
Surr: 2,4,6-Tribromophenol	925		1,000		92.5	65.9	141				
Surr: 2-Fluorobiphenyl	464		500.0		92.8	73.1	130				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724A</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>	Prep Date: <b>12/13/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/13/2022</b>	SeqNo: <b>1668259</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Nitrobenzene-d5	450		500.0		90.0	77.9	122				
Surr: Phenol-d6	764		1,000		76.4	78.9	117				S
Surr: p-Terphenyl	456		500.0		91.1	71.7	131				

**NOTES:**  
 S - Outlying spike recovery observed (low bias). Samples will be qualified with a Q.

Sample ID: <b>MB-38724</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668260</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	ND	30.0									
Bis(2-chloroethyl) ether	ND	50.0									
2-Chlorophenol	ND	40.0									
1,3-Dichlorobenzene	ND	40.0									
1,4-Dichlorobenzene	ND	30.0									
1,2-Dichlorobenzene	ND	40.0									
Benzyl alcohol	ND	150									Q
2-Methylphenol (o-cresol)	ND	40.0									
Hexachloroethane	ND	40.0									
N-Nitrosodi-n-propylamine	ND	80.0									
3&4-Methylphenol (m, p-cresol)	ND	30.0									Q
Nitrobenzene	ND	50.0									
Isophorone	ND	40.0									
2-Nitrophenol	ND	30.0									
2,4-Dimethylphenol	ND	30.0									
Bis(2-chloroethoxy)methane	ND	30.0									
2,4-Dichlorophenol	ND	30.0									
1,2,4-Trichlorobenzene	ND	30.0									
Naphthalene	ND	40.0									
4-Chloroaniline	ND	30.0									
Hexachlorobutadiene	ND	30.0									
4-Chloro-3-methylphenol	ND	30.0									Q



Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38724</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668260</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Methylnaphthalene	ND	30.0									
1-Methylnaphthalene	ND	30.0									
Hexachlorocyclopentadiene	ND	100									
2,4,6-Trichlorophenol	ND	30.0									
2,4,5-Trichlorophenol	ND	30.0									
2-Chloronaphthalene	ND	30.0									
2-Nitroaniline	ND	50.0									
Acenaphthene	ND	30.0									
Dimethylphthalate	ND	3,500									
2,6-Dinitrotoluene	ND	40.0									
Acenaphthylene	ND	30.0									
2,4-Dinitrophenol	ND	300									
Dibenzofuran	ND	30.0									
2,4-Dinitrotoluene	ND	60.0									
4-Nitrophenol	ND	200									Q
Fluorene	ND	30.0									
4-Chlorophenyl phenyl ether	ND	30.0									
Diethylphthalate	ND	750									
4,6-Dinitro-2-methylphenol	ND	250									
4-Bromophenyl phenyl ether	ND	30.0									
Hexachlorobenzene	ND	30.0									
Pentachlorophenol	ND	200									
Phenanthrene	ND	30.0									
Anthracene	ND	30.0									
Carbazole	ND	30.0									
Di-n-butylphthalate	ND	30.0									
Fluoranthene	ND	30.0									
Pyrene	ND	150									
Butyl Benzylphthalate	ND	50.0									
bis(2-Ethylhexyl)adipate	ND	200									
Benz(a)anthracene	ND	30.0									
Chrysene	ND	50.0									

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38724</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668260</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

bis (2-Ethylhexyl) phthalate	ND	40.0									
Di-n-octyl phthalate	ND	75.0									
Benzo(b)fluoranthene	ND	100									
Benzo(k)fluoranthene	ND	30.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	200									
Dibenz(a,h)anthracene	ND	100									
Benzo(g,h,i)perylene	ND	100									*
Surr: 2,4,6-Tribromophenol	1,530		2,000		76.7	16.2	150				
Surr: 2-Fluorobiphenyl	862		1,000		86.2	25.3	139				
Surr: Nitrobenzene-d5	767		1,000		76.7	12.7	143				
Surr: Phenol-d6	1,470		2,000		73.6	21.4	139				
Surr: p-Terphenyl	847		1,000		84.7	37.1	144				

**NOTES:**

Q - Associated calibration verification is below acceptance criteria (Refer to CCV-38724A). Result may be low-biased.

\* - Associated LCS is below acceptance criteria. Result may be low-biased.

Sample ID: <b>LCS-38724</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668261</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,480	30.0	2,000	0	73.9	54	114				
Bis(2-chloroethyl) ether	1,600	50.0	2,000	0	80.0	60.2	120				
2-Chlorophenol	1,670	40.0	2,000	0	83.4	63.8	111				
1,3-Dichlorobenzene	1,630	40.0	2,000	0	81.4	64.5	110				
1,4-Dichlorobenzene	1,640	30.0	2,000	0	82.2	64.3	112				
1,2-Dichlorobenzene	1,640	40.0	2,000	0	82.0	64.2	112				
Benzyl alcohol	334	150	2,000	0	16.7	5	159				
2-Methylphenol (o-cresol)	1,550	40.0	2,000	0	77.4	51.8	116				
Hexachloroethane	1,540	40.0	2,000	0	77.1	62.1	114				
N-Nitrosodi-n-propylamine	1,640	80.0	2,000	0	81.9	59.1	123				
3&4-Methylphenol (m, p-cresol)	1,530	30.0	2,000	0	76.5	55.3	120				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38724</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668261</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Nitrobenzene	1,630	50.0	2,000	0	81.6	63.1	119				
Isophorone	1,650	40.0	2,000	0	82.5	63.7	120				
2-Nitrophenol	1,790	30.0	2,000	0	89.5	66.4	116				
2,4-Dimethylphenol	1,610	30.0	2,000	0	80.4	55.5	112				
Bis(2-chloroethoxy)methane	1,640	30.0	2,000	0	82.2	64.6	112				
2,4-Dichlorophenol	1,640	30.0	2,000	0	81.8	57.1	116				
1,2,4-Trichlorobenzene	1,700	30.0	2,000	0	85.0	64.7	110				
Naphthalene	1,720	40.0	2,000	0	86.2	64.7	110				
4-Chloroaniline	1,470	30.0	2,000	0	73.6	64.6	112				
Hexachlorobutadiene	1,720	30.0	2,000	0	86.1	64.7	116				
4-Chloro-3-methylphenol	1,370	30.0	2,000	0	68.5	50.9	128				
2-Methylnaphthalene	1,680	30.0	2,000	0	84.1	63.6	119				
1-Methylnaphthalene	1,700	30.0	2,000	0	85.0	64.1	114				
Hexachlorocyclopentadiene	804	100	2,000	0	40.2	34.7	141				
2,4,6-Trichlorophenol	1,700	30.0	2,000	0	85.0	60.9	123				
2,4,5-Trichlorophenol	1,700	30.0	2,000	0	84.9	48.7	128				
2-Chloronaphthalene	1,700	30.0	2,000	0	85.0	65.4	114				
2-Nitroaniline	1,710	50.0	2,000	0	85.5	62.3	127				
Acenaphthene	1,700	30.0	2,000	0	85.2	63.3	118				
Dimethylphthalate	1,730	1,620	2,000	0	86.7	61.9	123				
2,6-Dinitrotoluene	1,770	40.0	2,000	0	88.6	64.6	123				
Acenaphthylene	1,720	30.0	2,000	0	86.0	61.9	112				
2,4-Dinitrophenol	2,870	300	4,000	0	71.7	5	132				
Dibenzofuran	1,670	30.0	2,000	0	83.3	60.2	116				
2,4-Dinitrotoluene	1,700	60.0	2,000	0	84.8	63.4	124				
4-Nitrophenol	1,430	200	2,000	0	71.7	8.76	130				
Fluorene	1,660	30.0	2,000	0	83.0	62.4	115				
4-Chlorophenyl phenyl ether	1,720	30.0	2,000	0	86.1	58.8	121				
Diethylphthalate	1,630	750	2,000	0	81.4	61.9	111				
4,6-Dinitro-2-methylphenol	1,790	250	2,000	0	89.7	5	134				
4-Bromophenyl phenyl ether	1,770	30.0	2,000	0	88.3	59.1	118				
Hexachlorobenzene	1,750	30.0	2,000	0	87.3	60.4	119				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38724</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>			Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>LCSS</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668261</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Pentachlorophenol	1,400	200	2,000	0	70.0	26.5	130				
Phenanthrene	1,680	30.0	2,000	0	83.9	57.9	116				
Anthracene	1,670	30.0	2,000	0	83.4	56.1	118				
Carbazole	1,720	30.0	2,000	0	85.9	48.9	128				
Di-n-butylphthalate	1,730	30.0	2,000	0	86.4	58.9	123				
Fluoranthene	1,730	30.0	2,000	0	86.5	54.7	126				
Pyrene	1,720	150	2,000	0	86.1	53.5	126				
Butyl Benzylphthalate	1,750	50.0	2,000	0	87.5	54.4	131				
bis(2-Ethylhexyl)adipate	1,740	200	2,000	0	87.2	51	133				
Benz(a)anthracene	1,820	30.0	2,000	0	91.0	40.1	140				
Chrysene	1,630	50.0	2,000	0	81.6	59.7	116				
bis (2-Ethylhexyl) phthalate	1,640	40.0	2,000	0	82.0	51.2	137				
Di-n-octyl phthalate	1,660	75.0	2,000	0	82.8	48.1	152				
Benzo(b)fluoranthene	1,600	100	2,000	0	80.0	57.9	122				
Benzo(k)fluoranthene	1,670	30.0	2,000	0	83.3	49	124				
Benzo(a)pyrene	1,570	40.0	2,000	0	78.5	53	108				
Indeno(1,2,3-cd)pyrene	1,380	200	2,000	0	69.2	56	124				
Dibenz(a,h)anthracene	1,550	100	2,000	0	77.6	55.8	125				
Benzo(g,h,i)perylene	1,200	100	2,000	0	59.9	61.3	112				S
Surr: 2,4,6-Tribromophenol	1,820		2,000		90.8	16.2	150				
Surr: 2-Fluorobiphenyl	883		1,000		88.3	25.3	139				
Surr: Nitrobenzene-d5	833		1,000		83.3	12.7	143				
Surr: Phenol-d6	1,530		2,000		76.3	21.4	139				
Surr: p-Terphenyl	900		1,000		90.0	37.1	144				

**NOTES:**

S - Outlying spike recovery observed (low bias). Samples will be qualified with a \*.

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>			Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	832	30.0	1,000	0	83.2	80	120				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>			Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>					
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>				Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Bis(2-chloroethyl) ether	871	50.0	1,000	0	87.1	80	120				
2-Chlorophenol	905	40.0	1,000	0	90.5	80	120				
1,3-Dichlorobenzene	906	40.0	1,000	0	90.6	80	120				
1,4-Dichlorobenzene	919	30.0	1,000	0	91.9	80	120				
1,2-Dichlorobenzene	931	40.0	1,000	0	93.1	80	120				
Benzyl alcohol	212	150	1,000	0	21.2	80	120				S
2-Methylphenol (o-cresol)	844	40.0	1,000	0	84.4	80	120				
Hexachloroethane	858	40.0	1,000	0	85.8	80	120				
N-Nitrosodi-n-propylamine	867	80.0	1,000	0	86.7	80	120				
3&4-Methylphenol (m, p-cresol)	830	30.0	1,000	0	83.0	80	120				
Nitrobenzene	883	50.0	1,000	0	88.3	80	120				
Isophorone	863	40.0	1,000	0	86.3	80	120				
2-Nitrophenol	986	30.0	1,000	0	98.6	80	120				
2,4-Dimethylphenol	869	30.0	1,000	0	86.9	80	120				
Bis(2-chloroethoxy)methane	896	30.0	1,000	0	89.6	80	120				
2,4-Dichlorophenol	863	30.0	1,000	0	86.3	80	120				
1,2,4-Trichlorobenzene	943	30.0	1,000	0	94.3	80	120				
Naphthalene	919	40.0	1,000	0	91.9	80	120				
4-Chloroaniline	809	30.0	1,000	0	80.9	80	120				
Hexachlorobutadiene	930	30.0	1,000	0	93.0	80	120				
4-Chloro-3-methylphenol	765	30.0	1,000	0	76.5	80	120				S
2-Methylnaphthalene	905	30.0	1,000	0	90.5	80	120				
1-Methylnaphthalene	906	30.0	1,000	0	90.6	80	120				
Hexachlorocyclopentadiene	408	100	1,000	0	40.8	80	120				S
2,4,6-Trichlorophenol	879	30.0	1,000	0	87.9	80	120				
2,4,5-Trichlorophenol	850	30.0	1,000	0	85.0	80	120				
2-Chloronaphthalene	907	30.0	1,000	0	90.7	80	120				
2-Nitroaniline	832	50.0	1,000	0	83.2	80	120				
Acenaphthene	920	30.0	1,000	0	92.0	80	120				
Dimethylphthalate	895	800	1,000	0	89.5	80	120				
2,6-Dinitrotoluene	908	40.0	1,000	0	90.8	80	120				
Acenaphthylene	893	30.0	1,000	0	89.3	80	120				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>		Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>						
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>			Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>						
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrophenol	1,440	300	2,000	0	72.0	80	120				S
Dibenzofuran	873	30.0	1,000	0	87.3	80	120				
2,4-Dinitrotoluene	858	60.0	1,000	0	85.8	80	120				
4-Nitrophenol	618	200	1,000	0	61.8	80	120				S
Fluorene	888	30.0	1,000	0	88.8	80	120				
4-Chlorophenyl phenyl ether	915	30.0	1,000	0	91.5	80	120				
Diethylphthalate	828	750	1,000	0	82.8	80	120				
4,6-Dinitro-2-methylphenol	816	250	1,000	0	81.6	80	120				
4-Bromophenyl phenyl ether	895	30.0	1,000	0	89.5	80	120				
Hexachlorobenzene	932	30.0	1,000	0	93.2	80	120				
Pentachlorophenol	766	200	1,000	0	76.6	80	120				S
Phenanthrene	901	30.0	1,000	0	90.1	80	120				
Anthracene	883	30.0	1,000	0	88.3	80	120				
Carbazole	822	30.0	1,000	0	82.2	80	120				
Di-n-butylphthalate	847	30.0	1,000	0	84.7	80	120				
Fluoranthene	893	30.0	1,000	0	89.3	80	120				
Pyrene	876	150	1,000	0	87.6	80	120				
Butyl Benzylphthalate	867	50.0	1,000	0	86.7	80	120				
bis(2-Ethylhexyl)adipate	813	200	1,000	0	81.3	80	120				
Benz(a)anthracene	914	30.0	1,000	0	91.4	80	120				
Chrysene	885	50.0	1,000	0	88.5	80	120				
bis (2-Ethylhexyl) phthalate	790	40.0	1,000	0	79.0	80	120				S
Di-n-octyl phthalate	808	75.0	1,000	0	80.8	80	120				
Benzo(b)fluoranthene	848	100	1,000	0	84.8	80	120				
Benzo(k)fluoranthene	908	30.0	1,000	0	90.8	80	120				
Benzo(a)pyrene	813	40.0	1,000	0	81.3	80	120				
Indeno(1,2,3-cd)pyrene	788	200	1,000	0	78.8	80	120				S
Dibenz(a,h)anthracene	836	100	1,000	0	83.6	80	120				
Benzo(g,h,i)perylene	651	100	1,000	0	65.1	80	120				S
Surr: 2,4,6-Tribromophenol	890		1,000		89.0	65.9	141				
Surr: 2-Fluorobiphenyl	473		500.0		94.7	73.1	130				
Surr: Nitrobenzene-d5	443		500.0		88.6	77.9	122				



Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>CCV-38724B</b>	SampType: <b>CCV</b>	Units: <b>µg/L</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>CCV</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668286</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Phenol-d6	827		1,000		82.7	78.9	117				
Surr: p-Terphenyl	459		500.0		91.8	71.7	131				

**NOTES:**  
 S - Outlying spike recovery observed (low bias). Samples will be qualified with a Q.

Sample ID: <b>2211617-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668276</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,290	35.9	2,390	0	53.9	31.6	121				
Bis(2-chloroethyl) ether	1,360	59.8	2,390	0	56.8	26.1	123				
2-Chlorophenol	1,420	47.8	2,390	0	59.4	26.8	122				
1,3-Dichlorobenzene	1,330	47.8	2,390	0	55.6	13	122				
1,4-Dichlorobenzene	1,320	35.9	2,390	0	55.1	14.1	122				
1,2-Dichlorobenzene	1,350	47.8	2,390	0	56.5	18.6	122				
Benzyl alcohol	203	179	2,390	0	8.48	5	142				
2-Methylphenol (o-cresol)	1,280	47.8	2,390	0	53.7	36.5	121				
Hexachloroethane	1,120	47.8	2,390	0	46.8	9.86	123				
N-Nitrosodi-n-propylamine	1,370	95.6	2,390	0	57.3	29.5	128				
3&4-Methylphenol (m, p-cresol)	1,330	35.9	2,390	0	55.8	30.6	127				
Nitrobenzene	1,390	59.8	2,390	0	58.3	30.8	123				
Isophorone	1,420	47.8	2,390	0	59.6	30.8	128				
2-Nitrophenol	1,490	35.9	2,390	0	62.2	30.3	126				
2,4-Dimethylphenol	1,410	35.9	2,390	0	58.8	32.2	120				
Bis(2-chloroethoxy)methane	1,440	35.9	2,390	0	60.1	34.3	120				
2,4-Dichlorophenol	1,460	35.9	2,390	0	61.3	33.7	123				
1,2,4-Trichlorobenzene	1,430	35.9	2,390	0	59.8	33.7	116				
Naphthalene	1,470	47.8	2,390	0	61.4	33.3	119				
4-Chloroaniline	1,150	35.9	2,390	0	48.0	10.2	120				
Hexachlorobutadiene	1,490	35.9	2,390	0	62.1	32.2	118				
4-Chloro-3-methylphenol	1,190	35.9	2,390	0	49.7	35.4	133				
2-Methylnaphthalene	1,440	35.9	2,390	0	60.4	39.4	117				

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668276</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1-Methylnaphthalene	1,450	35.9	2,390	0	60.8	37.1	121				
Hexachlorocyclopentadiene	320	120	2,390	0	13.4	5	134				
2,4,6-Trichlorophenol	1,480	35.9	2,390	0	61.7	37.2	129				
2,4,5-Trichlorophenol	1,490	35.9	2,390	0	62.5	37.1	124				
2-Chloronaphthalene	1,470	35.9	2,390	0	61.7	40.8	117				
2-Nitroaniline	1,470	59.8	2,390	0	61.5	40.4	131				
Acenaphthene	1,470	35.9	2,390	0	61.6	34.1	119				
Dimethylphthalate	1490	1,670	2,390	0	62.4	37	126				
2,6-Dinitrotoluene	1,520	47.8	2,390	0	63.6	43.4	123				
Acenaphthylene	1,510	35.9	2,390	0	63.0	38.5	115				
2,4-Dinitrophenol	1,960	359	4,781	0	41.1	5	127				
Dibenzofuran	1,450	35.9	2,390	0	60.8	39	119				
2,4-Dinitrotoluene	1,420	71.7	2,390	0	59.5	40.1	127				
4-Nitrophenol	1,130	239	2,390	0	47.4	7.49	136				
Fluorene	1,430	35.9	2,390	0	60.0	34.2	124				
4-Chlorophenyl phenyl ether	1,520	35.9	2,390	0	63.5	38.8	124				
Diethylphthalate	1,370	896	2,390	0	57.2	40.1	122				
4,6-Dinitro-2-methylphenol	1,440	299	2,390	0	60.4	5	142				
4-Bromophenyl phenyl ether	1,530	35.9	2,390	0	64.0	38.5	124				
Hexachlorobenzene	1,500	35.9	2,390	0	62.9	40.4	122				
Pentachlorophenol	1,320	239	2,390	0	55.3	16.6	148				
Phenanthrene	1,460	35.9	2,390	0	61.0	29.1	128				
Anthracene	1,450	35.9	2,390	0	60.5	32.5	124				
Carbazole	1,420	35.9	2,390	0	59.4	33.5	126				
Di-n-butylphthalate	1,440	35.9	2,390	0	60.3	38.3	134				
Fluoranthene	1,480	35.9	2,390	0	61.9	30	132				
Pyrene	1,490	179	2,390	0	62.2	30.9	130				
Butyl Benzylphthalate	1,460	59.8	2,390	0	61.0	35	147				
bis(2-Ethylhexyl)adipate	1,400	239	2,390	0	58.7	34.2	149				
Benz(a)anthracene	1,510	35.9	2,390	0	63.3	25	134				
Chrysene	1,400	59.8	2,390	0	58.7	28.6	125				
bis (2-Ethylhexyl) phthalate	1,400	47.8	2,390	0	58.6	22.9	158				

**Work Order:** 2211613  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-001AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668276</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Di-n-octyl phthalate	1,390	89.6	2,390	0	58.1	36.9	157				
Benzo(b)fluoranthene	1,220	120	2,390	0	51.2	21.4	140				
Benzo(k)fluoranthene	1,350	35.9	2,390	0	56.3	20.2	139				
Benzo(a)pyrene	1,130	47.8	2,390	0	47.1	17.6	149				
Indeno(1,2,3-cd)pyrene	974	239	2,390	0	40.7	22.7	139				
Dibenz(a,h)anthracene	1,270	120	2,390	0	53.0	23.7	145				
Benzo(g,h,i)perylene	802	120	2,390	0	33.5	18.6	134				
Surr: 2,4,6-Tribromophenol	1,600		2,390		67.0	16.2	150				
Surr: 2-Fluorobiphenyl	778		1,195		65.1	25.3	139				
Surr: Nitrobenzene-d5	723		1,195		60.5	12.7	143				
Surr: Phenol-d6	1,390		2,390		58.2	21.4	139				
Surr: p-Terphenyl	801		1,195		67.0	37.1	144				

Sample ID: <b>2211617-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668277</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,370	35.4	2,360	0	57.9	31.6	121	1,288	5.85	50	
Bis(2-chloroethyl) ether	1,420	59.0	2,360	0	60.0	26.1	123	1,358	4.12	50	
2-Chlorophenol	1,490	47.2	2,360	0	63.3	26.8	122	1,419	5.08	50	
1,3-Dichlorobenzene	1,390	47.2	2,360	0	58.9	13	122	1,330	4.38	50	
1,4-Dichlorobenzene	1,440	35.4	2,360	0	60.9	14.1	122	1,317	8.69	50	
1,2-Dichlorobenzene	1,430	47.2	2,360	0	60.5	18.6	122	1,350	5.62	50	
Benzyl alcohol	233	177	2,360	0	9.86	5	142	202.8	13.8	50	
2-Methylphenol (o-cresol)	1,330	47.2	2,360	0	56.5	36.5	121	1,284	3.71	50	
Hexachloroethane	1,230	47.2	2,360	0	52.1	9.86	123	1,118	9.48	50	
N-Nitrosodi-n-propylamine	1,450	94.4	2,360	0	61.5	29.5	128	1,369	5.78	50	
3&4-Methylphenol (m, p-cresol)	1,370	35.4	2,360	0	58.2	30.6	127	1,333	3.09	50	
Nitrobenzene	1,480	59.0	2,360	0	62.6	30.8	123	1,393	5.82	50	
Isophorone	1,470	47.2	2,360	0	62.5	30.8	128	1,425	3.48	50	
2-Nitrophenol	1,610	35.4	2,360	0	68.1	30.3	126	1,486	7.78	50	

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2211617-001AMSD	SampType: MSD	Units: µg/Kg-dry				Prep Date: 12/5/2022	RunNo: 80657				
Client ID: BATCH	Batch ID: 38724					Analysis Date: 12/14/2022	SeqNo: 1668277				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dimethylphenol	1,500	35.4	2,360	0	63.7	32.2	120	1,405	6.74	50	
Bis(2-chloroethoxy)methane	1,500	35.4	2,360	0	63.5	34.3	120	1,437	4.16	50	
2,4-Dichlorophenol	1,500	35.4	2,360	0	63.4	33.7	123	1,464	2.20	50	
1,2,4-Trichlorobenzene	1,510	35.4	2,360	0	63.9	33.7	116	1,429	5.36	50	
Naphthalene	1,530	47.2	2,360	0	65.0	33.3	119	1,467	4.52	50	
4-Chloroaniline	1,240	35.4	2,360	0	52.5	10.2	120	1,147	7.71	50	
Hexachlorobutadiene	1,610	35.4	2,360	0	68.3	32.2	118	1,485	8.20	50	
4-Chloro-3-methylphenol	1,280	35.4	2,360	0	54.3	35.4	133	1,187	7.62	50	
2-Methylnaphthalene	1,550	35.4	2,360	0	65.7	39.4	117	1,444	7.16	50	
1-Methylnaphthalene	1,560	35.4	2,360	0	66.1	37.1	121	1,454	7.02	50	
Hexachlorocyclopentadiene	398	118	2,360	0	16.9	5	134	320.3	21.7	50	
2,4,6-Trichlorophenol	1,590	35.4	2,360	0	67.5	37.2	129	1,475	7.62	50	
2,4,5-Trichlorophenol	1,540	35.4	2,360	0	65.4	37.1	124	1,493	3.40	50	
2-Chloronaphthalene	1,550	35.4	2,360	0	65.9	40.8	117	1,475	5.26	50	
2-Nitroaniline	1,540	59.0	2,360	0	65.2	40.4	131	1,470	4.58	50	
Acenaphthene	1,570	35.4	2,360	0	66.7	34.1	119	1,472	6.69	50	
Dimethylphthalate	1590	1,650	2,360	0	67.2	37	126	1,493	6.08	50	
2,6-Dinitrotoluene	1,580	47.2	2,360	0	66.8	43.4	123	1,521	3.63	50	
Acenaphthylene	1,600	35.4	2,360	0	67.7	38.5	115	1,507	5.82	50	
2,4-Dinitrophenol	2,160	354	4,720	0	45.8	5	127	1,964	9.57	50	
Dibenzofuran	1,530	35.4	2,360	0	65.0	39	119	1,454	5.31	50	
2,4-Dinitrotoluene	1,520	70.8	2,360	0	64.5	40.1	127	1,423	6.82	50	
4-Nitrophenol	1,240	236	2,360	0	52.6	7.49	136	1,132	9.18	50	
Fluorene	1,510	35.4	2,360	0	64.0	34.2	124	1,435	5.07	50	
4-Chlorophenyl phenyl ether	1,590	35.4	2,360	0	67.6	38.8	124	1,519	4.84	50	
Diethylphthalate	1,470	885	2,360	0	62.5	40.1	122	1,368	7.51	50	
4,6-Dinitro-2-methylphenol	1,540	295	2,360	0	65.3	5	142	1,443	6.63	50	
4-Bromophenyl phenyl ether	1,590	35.4	2,360	0	67.5	38.5	124	1,530	4.01	50	
Hexachlorobenzene	1,600	35.4	2,360	0	67.9	40.4	122	1,504	6.36	50	
Pentachlorophenol	1,480	236	2,360	0	62.8	16.6	148	1,321	11.5	50	
Phenanthrene	1,530	35.4	2,360	0	64.9	29.1	128	1,459	4.81	50	
Anthracene	1,500	35.4	2,360	0	63.4	32.5	124	1,447	3.42	50	

Work Order: 2211613  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-001AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80657</b>
Client ID: <b>BATCH</b>	Batch ID: <b>38724</b>		Analysis Date: <b>12/14/2022</b>	SeqNo: <b>1668277</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Carbazole	1,510	35.4	2,360	0	64.0	33.5	126	1,419	6.32	50	
Di-n-butylphthalate	1,520	35.4	2,360	0	64.5	38.3	134	1,441	5.49	50	
Fluoranthene	1,560	35.4	2,360	0	66.1	30	132	1,480	5.25	50	
Pyrene	1,560	177	2,360	0	66.1	30.9	130	1,488	4.70	50	
Butyl Benzylphthalate	1,540	59.0	2,360	0	65.3	35	147	1,457	5.59	50	
bis(2-Ethylhexyl)adipate	1,460	236	2,360	0	61.8	34.2	149	1,402	3.97	50	
Benz(a)anthracene	1,570	35.4	2,360	0	66.3	25	134	1,514	3.33	50	
Chrysene	1,430	59.0	2,360	0	60.7	28.6	125	1,403	2.13	50	
bis (2-Ethylhexyl) phthalate	1,470	47.2	2,360	0	62.3	22.9	158	1,401	4.81	50	
Di-n-octyl phthalate	1,430	88.5	2,360	0	60.8	36.9	157	1,389	3.18	50	
Benzo(b)fluoranthene	1,290	118	2,360	0	54.7	21.4	140	1,225	5.27	50	
Benzo(k)fluoranthene	1,360	35.4	2,360	0	57.4	20.2	139	1,345	0.738	50	
Benzo(a)pyrene	1,150	47.2	2,360	0	48.8	17.6	149	1,125	2.42	50	
Indeno(1,2,3-cd)pyrene	1,020	236	2,360	0	43.2	22.7	139	973.6	4.61	50	
Dibenz(a,h)anthracene	1,190	118	2,360	0	50.4	23.7	145	1,267	6.31	50	
Benzo(g,h,i)perylene	782	118	2,360	0	33.1	18.6	134	801.7	2.54	50	
Surr: 2,4,6-Tribromophenol	1,580		2,360		66.8	16.2	150		0		
Surr: 2-Fluorobiphenyl	799		1,180		67.7	25.3	139		0		
Surr: Nitrobenzene-d5	703		1,180		59.6	12.7	143		0		
Surr: Phenol-d6	1,390		2,360		58.7	21.4	139		0		
Surr: p-Terphenyl	777		1,180		65.8	37.1	144		0		

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double-sided printing.



Client Name: **LIBBY**  
 Logged by: **Clare Griggs**

Work Order Number: **2211613**  
 Date Received: **11/30/2022 11:42:00 AM**

### Chain of Custody

1. Is Chain of Custody complete? Yes  No  Not Present   
 2. How was the sample delivered? Client

### Log In

3. Coolers are present? Yes  No  NA   
 4. Shipping container/cooler in good condition? Yes  No   
 5. Custody Seals present on shipping container/cooler?  
 (Refer to comments for Custody Seals not intact) Yes  No  Not Present   
 6. Was an attempt made to cool the samples? Yes  No  NA   
 7. Were all items received at a temperature of >2°C to 6°C \* Yes  No  NA   
 8. Sample(s) in proper container(s)? Yes  No   
 9. Sufficient sample volume for indicated test(s)? Yes  No   
 10. Are samples properly preserved? Yes  No   
 11. Was preservative added to bottles? Yes  No  NA   
 12. Is there headspace in the VOA vials? Yes  No  NA   
 13. Did all samples containers arrive in good condition(unbroken)? Yes  No   
 14. Does paperwork match bottle labels? Yes  No   
 15. Are matrices correctly identified on Chain of Custody? Yes  No   
 16. Is it clear what analyses were requested? Yes  No   
 17. Were all holding times able to be met? Yes  No

### Special Handling (if applicable)

18. Was client notified of all discrepancies with this order? Yes  No  NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

### Item Information

Item #	Temp °C
Sample	3.9

\* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K122**

**Sending Laboratory:**

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154  
  
Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

**Subcontracted Laboratory:** 2211613

Fremont Analytical, Inc.  
3600 Fremont Ave N  
Seattle, WA 98103  
Phone: (206) 352-3790  
Fax:  
  
Requested Turnaround (TAT) Std

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

**Client Sample ID:** WB-SO-SD64-0005 **Soil Sampled:** 11/29/2022 08:29 Lab ID: L22K122-01

8270 SVOC TOC Metals SUB Ag Metals SUB As Metals SUB Cd Metals SUB Cr Metals SUB Cu Metals SUB Pb Metals SUB Zn Grain Size	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
---	---

Containers Supplied:

**Client Sample ID:** WB-SO-SD64-0020 **Soil Sampled:** 11/29/2022 08:55 Lab ID: L22K122-02

8270 SVOC TOC Metals SUB Ag Metals SUB As Metals SUB Cd Metals SUB Cr Metals SUB Cu Metals SUB Pb Metals SUB Zn Grain Size	Report to MDL  6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please 6000 method please
---	---

Containers Supplied:

Sherry Chilcutt  
Released By  
Sherry Chilcutt  
Date  
11/29/22

[Signature]  
Received By  
Date  
11/30/22  
11:42



**Client:** Fremont Analytical, Inc.  
**Address:** 3600 Fremont Avenue N  
Seattle, WA 98103  
**Attn:** Brianna Barnes & Matt Langston  
**Revised on:** \_\_\_\_\_

**Date:** January 3, 2023  
**Project:** Q.C. - Fremont Analytical  
**Project #:** 21S095-01  
**Sample #:** B22-1450 - 1470  
**Date sampled:** November 28 - 30, 2022

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	See Attached Reports	Sulfate Soundness	
	Proctor		Bulk Density & Voids	
	Sand Equivalent		WSDOT Degradation	
	Fracture Count		LA Abrasion	
	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,  
 Alex Eifrig  
 WABO Supervising Laboratory Technician

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-001B, WB-SO-SD64-0005 <b>Sample#:</b> B22-1450	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soil Classification System, ASTM-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray	
---	--	--	--

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b> No Specs  <b>Sample Meets Specs ?</b> N/A	D <sub>(5)</sub> = 0.019 mm D <sub>(10)</sub> = 0.038 mm D <sub>(15)</sub> = 0.057 mm D <sub>(30)</sub> = 0.147 mm D <sub>(50)</sub> = 0.299 mm D <sub>(60)</sub> = 0.376 mm D <sub>(90)</sub> = 1.833 mm Dust Ratio = 17/57	% Gravel = 3.4% % Sand = 76.8% % Silt & Clay = 19.8% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.53 Coeff. of Uniformity, C <sub>u</sub> = 9.93 Fineness Modulus = 1.83 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		99%	100.0%	0.0%
1/2"	12.50	99%	99%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		97%	100.0%	0.0%
#4	4.75	97%	97%	100.0%	0.0%
#8	2.36		93%	100.0%	0.0%
#10	2.00	93%	93%	100.0%	0.0%
#16	1.18		79%	100.0%	0.0%
#20	0.850		74%	100.0%	0.0%
#30	0.600		69%	100.0%	0.0%
#40	0.425	67%	67%	100.0%	0.0%
#50	0.300		50%	100.0%	0.0%
#60	0.250		44%	100.0%	0.0%
#80	0.180		34%	100.0%	0.0%
#100	0.150	30%	30%	100.0%	0.0%
#140	0.106		24%	100.0%	0.0%
#170	0.090		22%	100.0%	0.0%
#200	0.075	19.8%	19.8%	100.0%	0.0%

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2211603-002B, WB-SO-SD64-0020 <b>Sample#:</b> B22-1451	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soil Classification System, ASTM-2487</b> SC-SM, Silty, Clayey Sand <b>Sample Color:</b> Gray	 Certificate # 1356-01
---	--	---	---------------------------

ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>		D <sub>(5)</sub> = 0.008 mm      % Gravel = 0.2% D <sub>(10)</sub> = 0.016 mm      % Sand = 51.9% D <sub>(15)</sub> = 0.023 mm      % Silt & Clay = 47.9% D <sub>(30)</sub> = 0.047 mm      Liquid Limit = n/a D <sub>(50)</sub> = 0.082 mm      Plasticity Index = n/a D <sub>(60)</sub> = 0.118 mm      Sand Equivalent = n/a D <sub>(90)</sub> = 0.418 mm      Fracture % , 1 Face = n/a Dust Ratio = 9/17      Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.19 Coeff. of Uniformity, C <sub>u</sub> = 7.54 Fineness Modulus = 0.65 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
<b>No Specs</b> Sample Meets Specs ? <b>N/A</b>			

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		99%	100.0%	0.0%
#10	2.00	99%	99%	100.0%	0.0%
#16	1.18		95%	100.0%	0.0%
#20	0.850		93%	100.0%	0.0%
#30	0.600		92%	100.0%	0.0%
#40	0.425	91%	91%	100.0%	0.0%
#50	0.300		81%	100.0%	0.0%
#60	0.250		77%	100.0%	0.0%
#80	0.180		71%	100.0%	0.0%
#100	0.150	69%	69%	100.0%	0.0%
#140	0.106		57%	100.0%	0.0%
#170	0.090		52%	100.0%	0.0%
#200	0.075	47.9%	47.9%	100.0%	0.0%

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

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CHAIN OF CUSTODY RECORD

Omega COCID 1558

PAGE: 1

OF: 1

ADDRESS

Fremont Analytical, Inc.  
 1000 Fremont Ave.  
 Clatsop, WA 98103  
 TEL: 206-355-3740  
 FAX: 206-355-7178  
 Website: www.fremontanalytical.com

Q.C. - Fremont Analytical  
 Project # TBA

Page 1

Sampled 11-28, 29 + 30 - 2022

CLIENT CONTRACTOR <b>MTC</b>	COMPANY <b>Materials Testing and Consulti</b>	SPECIAL INSTRUCTIONS / COMMENTS
ADDRESS <b>777 Chrysler Drive,</b>		Standard TAT. Please email results to Brianna Barnes at bbarnes@fremontanalytical.com and Matt Langston at mlangston@fremontanalytical.com.
CITY, STATE, ZIP <b>Burlington, WA 98233</b>		
PHONE <b>(206) 241-1974</b>	FAX: _____ EMAIL: _____	
ACCOUNT #		

ITEM #	SAMPLE ID	CHAIN SAMPLE ID	BOTTLE TYPE	MATRIX	DATE COLLECTED	NUMBER OF CONTAINERS	COMMENTS: Method/Preservation/Flags NOT Sample Notation, Additional Sample Description
✓ 1	2211613-001B	WB-SO-SD64-0005	CLEAR JARS 32	Soil	11/29/2022 8:29:00 AM	:	Grainsize Analysis <b>822-1450</b>
	PHY-GRAIN						
✓ 2	2211613-002B	WB-SO-SD64-0020	CLEAR JARS 32	Soil	11/29/2022 8:55:00 AM	:	Grainsize Analysis <b>822-1451</b>
	PHY-GRAIN						

\* Gray silt w/ sand, clay & organics  
 For All samples

Requested By: <i>[Signature]</i>	Date: 12/22	Time: 9:29	Received By: <i>[Signature]</i>	Date: 12/23	Time: 11:20	REPORT TRANSMITTAL DESIRED <input type="checkbox"/> HANDCUFF (extra cost) <input type="checkbox"/> FAX <input type="checkbox"/> EMAIL <input type="checkbox"/> ONLINE
Requested By:	Date:	Time:	Received By:	Date:	Time:	
TAT:    Standards <input type="checkbox"/> RI'SH    Next SD <input type="checkbox"/> CAGED <input type="checkbox"/> SHED <input type="checkbox"/>						FOR LAB USE ONLY
Temp of sample: _____    Attempts Cost: _____						
Comments: _____						
Note: RI'SH requests will incur surcharges!						



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double-sided printing.



**Analytical Resources, LLC**  
Analytical Chemists and Consultants

21 December 2022

Sherry Chilcutt  
Libby Environmental  
3322 South Bay Road NE  
Olympia, WA 98506

RE: Dioxin/Furans 2022-2023 (L22K122 - Solid Wood Inc)

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

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

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

Associated Work Order(s)  
22K0552

Associated SDG ID(s)  
N/A

**Shelly Fishel** Digitally signed by Shelly Fishel  
Date: 2022.12.21 14:52:13 -08'00'

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

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

Analytical Resources, LLC

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

Shelly Fishel, Project Manager





22K0552

# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K122**

**Sending Laboratory:**

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

**Subcontracted Laboratory:**

Analytical Resources, Inc.  
4611 South 134th Place  
Seattle, WA 98109  
Phone: (206) 695-6210  
Fax:

**Requested Turnaround (TAT)** Std

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

**Client Sample ID: WB-SO-SD64-0005** *Soil Sampled: 11/29/2022 08:29* Lab ID: L22K122-01

Dioxins / Furans

Report all isomers and congeners

*Containers Supplied:*

**Client Sample ID: WB-SO-SD64-0020** *Soil Sampled: 11/29/2022 08:55* Lab ID: L22K122-02

Dioxins / Furans

HOLD

*Containers Supplied:*

Sherry Chilcutt 11/30/22 Phillip PA AR 11/30/22  
Released By Date Received By Date

Sherry Chilcutt 11/29/22  
Released By Date



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**ANALYTICAL REPORT FOR SAMPLES**

<b>Sample ID</b>	<b>Laboratory ID</b>	<b>Matrix</b>	<b>Date Sampled</b>	<b>Date Received</b>
WB-SO-SD64-0005	22K0552-01	Solid	29-Nov-2022 08:29	30-Nov-2022 13:05



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

## **Work Order Case Narrative**

**Client:** Libby Environmental  
**Project:** Dioxin/Furans 2022-2023  
**Project Number:** L22K122 - Solid Wood Inc  
**Work Order:** 22K0552

### **Revised Report - December 21, 2022**

This report was revised to remove data that was not requested from sample 22K0552-02 due to data entry error.

### **Sample receipt**

Sample(s) as listed on the preceding page were received 30-Nov-2022 13:05 under ARI work order 22K0552. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### **Dioxin/Furans - EPA Method 8290**

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column recently developed by Restek. The RTX-Dioxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

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

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.





# Cooler Receipt Form

ARI Client: Libby  
 COC No(s): \_\_\_\_\_ (NA)  
 Assigned ARI Job No: 22K0552

Project Name: L22K122  
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
 Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES (NA) NO  
 Were custody papers included with the cooler? YES NO  
 Were custody papers properly filled out (ink, signed, etc.) YES NO  
 Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.8  
 Time 13:05  
 If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 5009708

Cooler Accepted by: PIB Date: 11/30/22 Time: 13:05

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NO) NO  
 What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: Ice & Baggies  
 Was sufficient ice used (if appropriate)? NA (YES) NO  
 How were bottles sealed in plastic bags? Individually Grouped (Not)  
 Did all bottles arrive in good condition (unbroken)? (YES) NO  
 Were all bottle labels complete and legible? YES NO  
 Did the number of containers listed on COC match with the number of containers received? YES NO  
 Did all bottle labels and tags agree with custody papers? YES NO  
 Were all bottles used correct for the requested analyses? YES NO  
 Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... NA (YES) NO  
 Were all VOC vials free of air bubbles? NA (YES) NO  
 Was sufficient amount of sample sent in each bottle? (YES) NO  
 Date VOC Trip Blank was made at ARI: \_\_\_\_\_ (NA)  
 Were the sample(s) split by ARI? NA YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: PIB Date: 11/30/22 Time: 1458 Labels checked by: \_\_\_\_\_

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

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

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	<b>Reported:</b> 21-Dec-2022 14:50
--	--	---------------------------------------

**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/29/2022 08:29  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/19/2022 23:06

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 13.82 g (wet) Final Volume: 20 uL	Extract ID: 22K0552-01 A 01 Dry Weight: 10.02 g % Solids: 72.48
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0552-01 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleaned: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0552-01 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0552-01 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF			0.655-0.886	0.47	1.00	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.39	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF		0.823	1.318-1.783	0.31	1.00	<b>0.64</b>	ng/kg	EMPC, J
2,3,4,7,8-PeCDF			1.318-1.783	0.29	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.39	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.30	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.29	1.00	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.29	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.34	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.33	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		0.958	1.054-1.426	0.32	1.00	<b>1.87</b>	ng/kg	EMPC
1,2,3,7,8,9-HxCDD			1.054-1.426	0.35	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.061	0.893-1.208	0.32	1.00	<b>9.93</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.46	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.053	0.893-1.208	0.42	2.50	<b>32.1</b>	ng/kg	
OCDF		0.937	0.757-1.024	0.66	2.50	<b>12.2</b>	ng/kg	
OCDD		0.863	0.757-1.024	0.82	9.98	<b>228</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>1.44</b>	ng/kg	
Total TCDD					1.00	ND	ng/kg	U
Total PeCDF					1.00	<b>4.38</b>	ng/kg	
Total PeCDD					1.00	ND	ng/kg	U
Total HxCDF					1.00	<b>10.3</b>	ng/kg	
Total HxCDD					1.00	<b>7.61</b>	ng/kg	
Total HpCDF					1.00	<b>21.9</b>	ng/kg	
Total HpCDD					1.00	<b>79.8</b>	ng/kg	





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/29/2022 08:29

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/19/2022 23:06

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		1.25		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		0.70		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		1.15		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		0.49		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/29/2022 08:29

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/19/2022 23:06

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.734	0.655-0.886	24-169 %	42.5	%	
<i>13C12-2,3,7,8-TCDD</i>		0.779	0.655-0.886	25-164 %	59.6	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.556	1.318-1.783	24-185 %	68.2	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.560	1.318-1.783	21-178 %	69.9	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.619	1.318-1.783	25-181 %	77.2	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.498	0.434-0.587	26-152 %	85.2	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.484	0.434-0.587	26-123 %	84.1	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.482	0.434-0.587	28-136 %	87.9	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.521	0.434-0.587	29-147 %	101	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.266	1.054-1.426	32-141 %	87.7	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.217	1.054-1.426	28-130 %	83.1	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.454	0.374-0.506	28-143 %	75.5	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.453	0.374-0.506	26-138 %	80.8	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.084	0.893-1.208	23-140 %	95.5	%	
<i>13C12-OCDD</i>		0.904	0.757-1.024	17-157 %	97.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	62.0	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	<b>Reported:</b> 21-Dec-2022 14:50
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**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/29/2022 08:29  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0552-01  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	72.48	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	Reported: 21-Dec-2022 14:50
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKL0146-BLK1)</b>											
				Prepared: 13-Dec-2022		Analyzed: 19-Dec-2022 20:38					
2,3,7,8-TCDF		0.655-0.886	0.08	1.00	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.10	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.18	1.00	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.17	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.18	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.14	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.15	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF	1.331	0.893-1.208		1.00	0.29	ng/kg					EMPC, J
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.11	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD	1.502	0.893-1.208		2.50	0.58	ng/kg					EMPC, J
OCDF	1.023	0.757-1.024		2.50	1.80	ng/kg					J
OCDD	0.774	0.757-1.024		10.0	4.61	ng/kg					J
<b>Homologue group</b>											
Total TCDF				1.00	ND	ng/kg					U
Total TCDD				1.00	ND	ng/kg					U
Total PeCDF				1.00	ND	ng/kg					U
Total PeCDD				1.00	ND	ng/kg					U
Total HxCDF				1.00	0.16	ng/kg					J
Total HxCDD				1.00	ND	ng/kg					U
Total HpCDF				1.00	ND	ng/kg					U
Total HpCDD				1.00	ND	ng/kg					U

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.23  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.01  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC=ND): 0.22  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0 EDL, EMPC=ND): 0.00



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Blank (BKL0146-BLK1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 20:38

Labeled compounds

13C12-2,3,7,8-TCDF	0.737	0.655-0.886			68.2					24-169 %	
13C12-2,3,7,8-TCDD	0.746	0.655-0.886			86.3					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.525	1.318-1.783			77.9					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.526	1.318-1.783			74.9					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			83.6					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.508	0.434-0.587			103					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.560	0.434-0.587			110					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.488	0.434-0.587			102					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.508	0.434-0.587			106					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.252	1.054-1.426			103					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.246	1.054-1.426			104					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.453	0.374-0.506			85.2					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.449	0.374-0.506			86.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	0.983	0.893-1.208			111					23-140 %	
13C12-OCDD	0.877	0.757-1.024			101					17-157 %	
37Cl4-2,3,7,8-TCDD					91.8					35-197 %	

**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

2,3,7,8-TCDF	0.754	0.655-0.886		1.00	19.1	ng/kg	95.5	75-158 %			
2,3,7,8-TCDD	0.831	0.655-0.886		1.00	21.7	ng/kg	109	67-158 %			
1,2,3,7,8-PeCDF	1.544	1.318-1.783		1.00	104	ng/kg	104	80-134 %			
2,3,4,7,8-PeCDF	1.556	1.318-1.783		1.00	101	ng/kg	101	68-160 %			
1,2,3,7,8-PeCDD	1.483	1.318-1.783		1.00	115	ng/kg	115	70-142 %			
1,2,3,4,7,8-HxCDF	1.245	1.054-1.426		1.00	111	ng/kg	111	72-134 %			
1,2,3,6,7,8-HxCDF	1.247	1.054-1.426		1.00	120	ng/kg	120	84-130 %			
2,3,4,6,7,8-HxCDF	1.281	1.054-1.426		1.00	110	ng/kg	110	70-156 %			
1,2,3,7,8,9-HxCDF	1.214	1.054-1.426		1.00	105	ng/kg	105	78-130 %			
1,2,3,4,7,8-HxCDD	1.230	1.054-1.426		1.00	118	ng/kg	118	70-164 %			
1,2,3,6,7,8-HxCDD	1.117	1.054-1.426		1.00	114	ng/kg	114	76-134 %			
1,2,3,7,8,9-HxCDD	1.239	1.054-1.426		1.00	112	ng/kg	112	64-162 %			
1,2,3,4,6,7,8-HpCDF	0.971	0.893-1.208		1.00	108	ng/kg	108	82-122 %			
1,2,3,4,7,8,9-HpCDF	0.981	0.893-1.208		1.00	105	ng/kg	105	78-138 %			
1,2,3,4,6,7,8-HpCDD	1.041	0.893-1.208		2.50	114	ng/kg	114	70-140 %			
OCDF	0.906	0.757-1.024		2.50	175	ng/kg	87.6	63-170 %			
OCDD	0.835	0.757-1.024		10.0	222	ng/kg	111	78-144 %			



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

Labeled compounds

13C12-2,3,7,8-TCDF	0.745	0.655-0.886			35.2				24-169 %		
13C12-2,3,7,8-TCDD	0.751	0.655-0.886			62.0				25-164 %		
13C12-1,2,3,7,8-PeCDF	1.532	1.318-1.783			73.8				24-185 %		
13C12-2,3,4,7,8-PeCDF	1.530	1.318-1.783			70.9				21-178 %		
13C12-1,2,3,7,8-PeCDD	1.603	1.318-1.783			80.6				25-181 %		
13C12-1,2,3,4,7,8-HxCDF	0.497	0.434-0.587			94.0				26-152 %		
13C12-1,2,3,6,7,8-HxCDF	0.510	0.434-0.587			97.1				26-123 %		
13C12-2,3,4,6,7,8-HxCDF	0.500	0.434-0.587			95.4				28-136 %		
13C12-1,2,3,7,8,9-HxCDF	0.497	0.434-0.587			104				29-147 %		
13C12-1,2,3,4,7,8-HxCDD	1.248	1.054-1.426			95.6				32-141 %		
13C12-1,2,3,6,7,8-HxCDD	1.225	1.054-1.426			96.9				28-130 %		
13C12-1,2,3,4,6,7,8-HpCDF	0.435	0.374-0.506			80.0				28-143 %		
13C12-1,2,3,4,7,8,9-HpCDF	0.446	0.374-0.506			84.4				26-138 %		
13C12-1,2,3,4,6,7,8-HpCDD	1.061	0.893-1.208			100				23-140 %		
13C12-OCDD	0.895	0.757-1.024			97.4				17-157 %		
37Cl4-2,3,7,8-TCDD					65.7				35-197 %		

**LCS Dup (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

2,3,7,8-TCDF	0.699	0.655-0.886		1.00	18.6	ng/kg	93.0	75-158 %	2.64	25	
2,3,7,8-TCDD	0.791	0.655-0.886		1.00	20.8	ng/kg	104	67-158 %	4.29	25	
1,2,3,7,8-PeCDF	1.479	1.318-1.783		1.00	101	ng/kg	101	80-134 %	3.04	25	
2,3,4,7,8-PeCDF	1.536	1.318-1.783		1.00	102	ng/kg	102	68-160 %	0.13	25	
1,2,3,7,8-PeCDD	1.493	1.318-1.783		1.00	113	ng/kg	113	70-142 %	1.47	25	
1,2,3,4,7,8-HxCDF	1.214	1.054-1.426		1.00	110	ng/kg	110	72-134 %	0.87	25	
1,2,3,6,7,8-HxCDF	1.226	1.054-1.426		1.00	113	ng/kg	113	84-130 %	5.92	25	
2,3,4,6,7,8-HxCDF	1.215	1.054-1.426		1.00	105	ng/kg	105	70-156 %	4.88	25	
1,2,3,7,8,9-HxCDF	1.200	1.054-1.426		1.00	107	ng/kg	107	78-130 %	1.90	25	
1,2,3,4,7,8-HxCDD	1.205	1.054-1.426		1.00	117	ng/kg	117	70-164 %	0.52	25	
1,2,3,6,7,8-HxCDD	1.212	1.054-1.426		1.00	109	ng/kg	109	76-134 %	5.04	25	
1,2,3,7,8,9-HxCDD	1.194	1.054-1.426		1.00	112	ng/kg	112	64-162 %	0.06	25	
1,2,3,4,6,7,8-HpCDF	0.979	0.893-1.208		1.00	109	ng/kg	109	82-122 %	1.26	25	
1,2,3,4,7,8,9-HpCDF	0.974	0.893-1.208		1.00	109	ng/kg	109	78-138 %	3.62	25	
1,2,3,4,6,7,8-HpCDD	1.032	0.893-1.208		2.50	103	ng/kg	103	70-140 %	10.00	25	
OCDF	0.897	0.757-1.024		2.50	182	ng/kg	91.1	63-170 %	3.86	25	
OCDD	0.906	0.757-1.024		10.0	217	ng/kg	108	78-144 %	2.50	25	





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS Dup (BKL0146-BSD1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

Labeled compounds

13C12-2,3,7,8-TCDF	0.744	0.655-0.886			60.8					24-169 %	
13C12-2,3,7,8-TCDD	0.762	0.655-0.886			81.8					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.552	1.318-1.783			77.3					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.560	1.318-1.783			73.3					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			84.4					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.500	0.434-0.587			91.3					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.500	0.434-0.587			94.4					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.495	0.434-0.587			92.9					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.513	0.434-0.587			97.9					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.255	1.054-1.426			93.1					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.260	1.054-1.426			93.9					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.449	0.374-0.506			78.0					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.443	0.374-0.506			81.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1.031	0.893-1.208			102					23-140 %	
13C12-OCDD	0.938	0.757-1.024			98.7					17-157 %	
37Cl4-2,3,7,8-TCDD					82.5					35-197 %	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8290A in Solid</b>	
2,3,7,8-TCDF	DoD-ELAP,NELAP,WADOE
2,3,7,8-TCDD	NELAP,WADOE
1,2,3,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
2,3,4,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP,WADOE
OCDF	DoD-ELAP,NELAP,WADOE
OCDD	DoD-ELAP,NELAP,WADOE
Total TCDF	DoD-ELAP,NELAP,WADOE
Total TCDD	DoD-ELAP,NELAP,WADOE
Total PeCDF	DoD-ELAP,NELAP,WADOE
Total PeCDD	DoD-ELAP,NELAP,WADOE
Total HxCDF	DoD-ELAP,NELAP,WADOE
Total HxCDD	DoD-ELAP,NELAP,WADOE
Total HpCDF	DoD-ELAP,NELAP,WADOE
Total HpCDD	DoD-ELAP,NELAP,WADOE
13C12-2,3,7,8-TCDF	DoD-ELAP,NELAP
13C12-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDF	DoD-ELAP,NELAP
13C12-2,3,4,7,8-PeCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP



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Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

13C12-1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP
13C12-OCDD	DoD-ELAP,NELAP
37Cl4-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,4-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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**Reported:**  
21-Dec-2022 14:50

### Notes and Definitions

- \* Flagged value is not within established control limits.
- EMPC Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- X Indicates possible CDPE interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

February 2, 2023

Hannah Morse  
Pioneer Technologies Corporation  
5205 Corporate Center Ct SE, Suite C  
Lacey, WA 98503

Dear Hannah Morse:

Please find enclosed the analytical data report for the Solid Wood, Inc. project located in Olympia, Washington.

The results of the analyses are summarized in the attached tables. Applicable detection limits and QA/QC data are included. The sample(s) will be disposed of within 30 days unless we are contacted to arrange long term storage.

Libby Environmental, Inc. appreciates the opportunity to have provided analytical services for this project. If you have any further questions about the data report, please give me a call. It was a pleasure working with you on this project, and we are looking forward to the next opportunity to work together.

Sincerely,

A handwritten signature in black ink, appearing to read "Sherry L. Chilcutt". The signature is fluid and cursive, written over a light blue horizontal line.

Sherry L. Chilcutt  
*Senior Chemist*  
*Libby Environmental, Inc.*

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double-sided printing.

# Libby Environmental, Inc.

SOLID WOOD INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K124

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Method Blank	WB-SO- SD70-0005	WB-SO- SD71-0005	WB-SO- SD72-0005	WB-SO- SD72-1005	WB-SO- SD73-0005
Date Sampled	Reporting	N/A	11/30/2022	11/30/2022	11/30/2022	11/30/2022
Date Analyzed	Limits	12/3/2022	12/3/2022	12/3/2022	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.18	nd	nd	nd	nd	nd
Chloromethane	0.18	nd	nd	nd	nd	nd
Vinyl chloride	0.06	nd	nd	nd	nd	nd
Bromomethane	0.27	nd	nd	nd	nd	nd
Chloroethane	0.18	nd	nd	nd	nd	nd
Trichlorofluoromethane	0.15	nd	nd	nd	nd	nd
1,1-Dichloroethene	0.15	nd	nd	nd	nd	nd
Methylene chloride	0.06	nd	nd	nd	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.15	nd	nd	nd	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd	nd
1,1-Dichloroethane	0.09	nd	nd	nd	nd	nd
2,2-Dichloropropane	0.15	nd	nd	nd	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.09	nd	nd	nd	nd	nd
Chloroform	0.09	nd	nd	nd	nd	nd
1,1,1-Trichloroethane (TCA)	0.09	nd	nd	nd	nd	nd
Carbon tetrachloride	0.09	nd	nd	nd	nd	nd
1,1-Dichloropropene	0.09	nd	nd	nd	nd	nd
Benzene	0.06	nd	nd	nd	nd	nd
1,2-Dichloroethane (EDC)	0.09	nd	nd	nd	nd	nd
Trichloroethene (TCE)	0.06	nd	nd	nd	nd	nd
1,2-Dichloropropane	0.09	nd	nd	nd	nd	nd
Dibromomethane	0.12	nd	nd	nd	nd	nd
Bromodichloromethane	0.09	nd	nd	nd	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.09	nd	nd	nd	nd	nd
Toluene	0.30	nd	nd	nd	nd	nd
Trans-1,3-Dichloropropene	0.09	nd *	nd *	nd *	nd *	nd *
1,1,2-Trichloroethane	0.09	nd	nd	nd	nd	nd
Tetrachloroethene (PCE)	0.09	nd	nd	nd	nd	nd
1,3-Dichloropropane	0.15	nd	nd	nd	nd	nd
Dibromochloromethane	0.09	nd	nd	nd	nd	nd
1,2-Dibromoethane (EDB)	0.015	nd	nd	nd	nd	nd
Chlorobenzene	0.09	nd	nd	nd	nd	nd
Ethylbenzene	0.15	nd	nd	nd	nd	nd
1,1,1,2-Tetrachloroethane	0.15	nd	nd	nd	nd	nd
Total Xylenes	0.45	nd	nd	nd	nd	nd
Styrene	0.09	nd	nd	nd	nd	nd

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	Method Blank	WB-SO- SD70-0005	WB-SO- SD71-0005	WB-SO- SD72-0005	WB-SO- SD72-1005	WB-SO- SD73-0005
Date Sampled	Reporting	N/A	11/30/2022	11/30/2022	11/30/2022	11/30/2022
Date Analyzed	Limits	12/3/2022	12/3/2022	12/3/2022	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Bromoform	0.45	nd	nd	nd	nd	nd
Isopropylbenzene	0.15	nd	nd	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.45	nd	nd	nd	nd	nd
Bromobenzene	0.12	nd	nd	nd	nd	nd
n-Propylbenzene	0.12	nd	nd	nd	nd	nd
1,2,3-Trichloropropane	0.12	nd	nd	nd	nd	nd
2-Chlorotoluene	0.12	nd	nd	nd	nd	nd
1,3,5-Trimethylbenzene	0.12	nd	nd	nd	nd	nd
4-Chlorotoluene	0.12	nd	nd	nd	nd	nd
tert-Butylbenzene	0.12	nd	nd	nd	nd	nd
1,2,4-Trimethylbenzene	0.12	nd	nd	nd	nd	nd
sec-Butylbenzene	0.12	nd	nd	nd	nd	nd
p-Isopropyltoluene	0.12	nd	nd	nd	nd	nd
1,3-Dichlorobenzene	0.12	nd	nd	nd	nd	nd
1,4-Dichlorobenzene	0.12	nd	nd	nd	nd	nd
n-Butylbenzene	0.12	nd	nd	nd	nd	nd
1,2-Dichlorobenzene	0.12	nd	nd	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.45	nd	nd	nd	nd	nd
1,2,4-Trichlorobenzene	0.45	nd *	nd *	nd *	nd *	nd *
Hexachloro-1,3-butadiene	0.45	nd	nd	nd	nd	nd
Naphthalene	0.45	nd	nd	nd	nd	nd
1,2,3-Trichlorobenzene	0.45	nd	nd	nd	nd	nd
Surrogate Recovery	Acceptable Limits (%)					
Dibromofluoromethane	27-188	135	143	152	159	163
1,2-Dichloroethane-d4	17-212	99	100	112	120	109
Toluene-d8	41-142	85	88	85	85	84
4-Bromofluorobenzene	47-167	63	65	65	63	64

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

"\*" LCS Spike recovery is outside acceptance limits. Analyte concentration may be biased low.

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

SOLID WOOD INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
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3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
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 Email: libbyenv@gmail.com

## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	WB-SO- SD74-0005	WB-SO- SD75-0005	WB-SO- SD75-0005 Dup
Date Sampled	Reporting	11/30/2022	11/30/2022
Date Analyzed	Limits	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)
Dichlorodifluoromethane	0.18	nd	nd
Chloromethane	0.18	nd	nd
Vinyl chloride	0.06	nd	nd
Bromomethane	0.27	nd	nd
Chloroethane	0.18	nd	nd
Trichlorofluoromethane	0.15	nd	nd
1,1-Dichloroethene	0.15	nd	nd
Methylene chloride	0.06	nd	nd
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.15	nd	nd
<i>trans</i> -1,2-Dichloroethene	0.09	nd	nd
1,1-Dichloroethane	0.09	nd	nd
2,2-Dichloropropane	0.15	nd	nd
<i>cis</i> -1,2-Dichloroethene	0.09	nd	nd
Chloroform	0.09	nd	nd
1,1,1-Trichloroethane (TCA)	0.09	nd	nd
Carbon tetrachloride	0.09	nd	nd
1,1-Dichloropropene	0.09	nd	nd
Benzene	0.06	nd	nd
1,2-Dichloroethane (EDC)	0.09	nd	nd
Trichloroethene (TCE)	0.06	nd	nd
1,2-Dichloropropane	0.09	nd	nd
Dibromomethane	0.12	nd	nd
Bromodichloromethane	0.09	nd	nd
<i>cis</i> -1,3-Dichloropropene	0.09	nd	nd
Toluene	0.30	nd	nd
Trans-1,3-Dichloropropene	0.09	nd *	nd *
1,1,2-Trichloroethane	0.09	nd	nd
Tetrachloroethene (PCE)	0.09	nd	nd
1,3-Dichloropropane	0.15	nd	nd
Dibromochloromethane	0.09	nd	nd
1,2-Dibromoethane (EDB)	0.015	nd	nd
Chlorobenzene	0.09	nd	nd
Ethylbenzene	0.15	nd	nd
1,1,1,2-Tetrachloroethane	0.15	nd	nd
Total Xylenes	0.45	nd	nd
Styrene	0.09	nd	nd

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## Volatile Organic Compounds by EPA Method 8260D in Soil

Sample Description	WB-SO- SD74-0005	WB-SO- SD75-0005	WB-SO- SD75-0005 Dup	
Date Sampled	Reporting	11/30/2022	11/30/2022	11/30/2022
Date Analyzed	Limits	12/3/2022	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Bromoform	0.45	nd	nd	nd
Isopropylbenzene	0.15	nd	nd	nd
1,1,2,2-Tetrachloroethane	0.45	nd	nd	nd
Bromobenzene	0.12	nd	nd	nd
n-Propylbenzene	0.12	nd	nd	nd
1,2,3-Trichloropropane	0.12	nd	nd	nd
2-Chlorotoluene	0.12	nd	nd	nd
1,3,5-Trimethylbenzene	0.12	nd	nd	nd
4-Chlorotoluene	0.12	nd	nd	nd
tert-Butylbenzene	0.12	nd	nd	nd
1,2,4-Trimethylbenzene	0.12	nd	nd	nd
sec-Butylbenzene	0.12	nd	nd	nd
p-Isopropyltoluene	0.12	nd	nd	nd
1,3-Dichlorobenzene	0.12	nd	nd	nd
1,4-Dichlorobenzene	0.12	nd	nd	nd
n-Butylbenzene	0.12	nd	nd	nd
1,2-Dichlorobenzene	0.12	nd	nd	nd
1,2-Dibromo-3-Chloropropane	0.45	nd	nd	nd
1,2,4-Trichlorobenzene	0.45	nd *	nd *	nd *
Hexachloro-1,3-butadiene	0.45	nd	nd	nd
Naphthalene	0.45	nd	nd	nd
1,2,3-Trichlorobenzene	0.45	nd	nd	nd
Surrogate Recovery	Acceptable Limits (%)			
Dibromofluoromethane	27-188	161	152	158
1,2-Dichloroethane-d4	17-212	116	101	116
Toluene-d8	41-142	81	81	89
4-Bromofluorobenzene	47-167	67	63	64

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

"\*" LCS Spike recovery is outside acceptance limits. Analyte concentration may be biased low.

ANALYSES PERFORMED BY: Sherry Chilcutt

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## QA/QC for Volatile Organic Compounds by EPA Method 8260D in Soil

Matrix Spike Sample Identification: WB-SO-SD75-0005								
Date Analyzed: 12/3/2022								
	Spiked Conc. (mg/kg)	MS Response (mg/kg)	MSD Response (mg/kg)	MS Recovery (%)	MSD Recovery (%)	RPD (%)	Recovery Limits (%)	Data Flag
Dichlorodifluoromethane	0.25	0.38	0.38	153	152	0.9	10-223	
Chloromethane	0.25	0.26	0.22	103	90	14.1	10-226	
Vinyl chloride	0.25	0.24	0.26	95	102	7.3	10-208	
Bromomethane	0.25	0.21	0.43	83	173	69.6	29-205	R
Chloroethane	0.25	0.21	0.19	86	75	13.6	10-245	
Trichlorofluoromethane	0.25	0.29	0.30	115	119	3.2	10-238	
1,1-Dichloroethene	0.25	0.28	0.29	111	117	4.9	50-187	
Methylene chloride	0.25	0.23	0.26	93	105	12.9	15-237	
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.25	0.23	0.22	91	87	3.9	35-156	
<i>trans</i> -1,2-Dichloroethene	0.25	0.25	0.26	101	104	2.8	38-175	
1,1-Dichloroethane	0.25	0.27	0.29	110	115	4.4	67-164	
2,2-Dichloropropane	0.25	0.32	0.33	128	132	2.8	75-162	
<i>cis</i> -1,2-Dichloroethene	0.25	0.24	0.24	98	98	0.1	33-166	
Chloroform	0.25	0.34	0.33	137	132	3.6	18-225	
1,1,1-Trichloroethane (TCA)	0.25	0.38	0.38	152	151	0.7	73-162	
Carbon tetrachloride	0.25	0.41	0.41	164	163	0.3	70-175	
1,1-Dichloropropene	0.25	0.19	0.19	78	76	2.7	55-121	
Benzene	0.25	0.21	0.21	84	85	0.7	65-126	
1,2-Dichloroethane (EDC)	0.25	0.28	0.27	112	107	4.7	66-147	
Trichloroethene (TCE)	0.25	0.27	0.27	108	109	0.6	71-126	
1,2-Dichloropropane	0.25	0.20	0.20	82	80	1.7	55-146	
Dibromomethane	0.25	0.37	0.34	148	134	9.5	67-153	
Bromodichloromethane	0.25	0.43	0.42	172	169	1.6	75-157	S
<i>cis</i> -1,3-Dichloropropene	0.25	0.16	0.16	64	65	2.4	32-130	
Toluene	0.25	0.23	0.22	91	89	2.7	67-136	
Trans-1,3-Dichloropropene	0.25	0.15	0.15	62	59	5.2	51-115	
1,1,2-Trichloroethane	0.25	0.30	0.29	121	117	3.9	61-157	
Tetrachloroethene (PCE)	0.25	0.36	0.35	144	138	4.3	45-166	
1,3-Dichloropropane	0.25	0.20	0.20	81	78	2.8	51-133	
Dibromochloromethane	0.25	0.49	0.50	194	201	3.5	61-157	S
1,2-Dibromoethane (EDB)	0.25	0.30	0.29	121	117	3.7	52-149	
Chlorobenzene	0.25	0.28	0.28	110	113	2.6	69-148	
Ethylbenzene	0.25	0.18	0.18	71	73	3.2	55-140	
1,1,1,2-Tetrachloroethane	0.25	0.46	0.45	185	181	1.8	70-173	S
Total Xylenes	0.75	0.54	0.54	71	72	1.3	43-149	
Styrene	0.25	0.17	0.17	70	67	3.8	40-139	



# Libby Environmental, Inc.

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 Olympia, Washington  
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## QA/QC for Volatile Organic Compounds by EPA Method 8260D in Soil

Matrix Spike Sample Identification: WB-SO-SD75-0005								
Date Analyzed: 12/3/2022								
	Spiked Conc. (mg/kg)	MS Response (mg/kg)	MSD Response (mg/kg)	MS Recovery (%)	MSD Recovery (%)	RPD (%)	Recovery Limits (%)	Data Flag
Bromoform	0.25	0.74	0.71	297	282	5.2	16-220	S
Isopropylbenzene	0.25	0.15	0.15	62	62	0.0	31-151	
1,1,2,2-Tetrachloroethane	0.25	0.24	0.30	95	118	21.6	35-176	
Bromobenzene	0.25	0.23	0.31	90	125	32.5	65-138	
n-Propylbenzene	0.25	0.13	0.18	54	73	31.2	52-147	
1,2,3-Trichloropropane	0.25	0.28	0.35	113	139	20.7	48-172	
2-Chlorotoluene	0.25	0.13	0.19	52	75	34.7	53-138	S
1,3,5-Trimethylbenzene	0.25	0.13	0.19	54	75	32.6	47-148	
4-Chlorotoluene	0.25	0.14	0.19	54	76	32.8	51-132	
tert-Butylbenzene	0.25	0.12	0.18	48	70	37.7	20-150	R
1,2,4-Trimethylbenzene	0.25	0.12	0.17	50	69	32.7	47-144	
sec-Butylbenzene	0.25	0.14	0.20	57	81	34.5	49-147	
Isopropyltoluene	0.25	0.13	0.18	53	73	31.9	42-139	
1,3-Dichlorobenzene	0.25	0.24	0.35	97	139	35.3	68-143	
1,4-Dichlorobenzene	0.25	0.26	0.37	106	146	31.9	71-140	S
n-Butylbenzene	0.25	0.12	0.16	48	63	28.5	38-148	
1,2-Dichlorobenzene	0.25	0.22	0.30	88	120	30.5	60-138	
1,2-Dibromo-3-Chloropropane	0.25	0.26	0.31	104	125	18.4	10-213	
1,2,4-Trichlorobenzene	0.25	0.14	0.18	56	72	25.6	10-180	
Hexachloro-1,3-butadiene	0.25	0.25	0.32	99	128	25.5	10-228	
Naphthalene	0.25	0.10	0.12	40	46	14.5	10-180	
1,2,3-Trichlorobenzene	0.25	0.17	0.21	69	83	18.2	10-194	
Surrogate Recovery (%)				MS	MSD			
Dibromofluoromethane				160	153		27-188	
1,2-Dichloroethane-d4				124	119		17-212	
Toluene-d8				91	89		41-142	
4-Bromofluorobenzene				92	91		47-167	

ACCEPTABLE RPD IS 35%

"R" High relative percent difference observed.

"S" Spike compound recovery is outside acceptance limits.

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

SOLID WOOD INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K124

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Laboratory Control Sample

Date Analyzed: 12/3/2022					
	Spiked Conc. (mg/kg)	LCS Response (mg/kg)	LCS Recovery (%)	Recovery Limits (%)	Data Flag
Dichlorodifluoromethane	0.25	0.37	148	10-236	
Chloromethane	0.25	0.22	87	10-229	
Vinyl chloride	0.25	0.23	92	15-226	
Bromomethane	0.25	0.18	72	50-183	
Chloroethane	0.25	0.44	174	26-324	
Trichlorofluoromethane	0.25	0.40	162	79-209	
1,1-Dichloroethene	0.25	0.31	125	38-193	
Methylene chloride	0.25	0.24	95	51-199	
Methyl <i>tert</i> - Butyl Ether (MTBE)	0.25	0.16	64	43-147	
<i>trans</i> -1,2-Dichloroethene	0.25	0.30	118	53-156	
1,1-Dichloroethane	0.25	0.36	143	68-169	
2,2-Dichloropropane	0.25	0.28	112	50-196	
<i>cis</i> -1,2-Dichloroethene	0.25	0.20	82	10-219	
Chloroform	0.25	0.31	124	47-192	
1,1,1-Trichloroethane (TCA)	0.25	0.35	142	67-173	
Carbon tetrachloride	0.25	0.36	143	69-170	
1,1-Dichloropropene	0.25	0.16	64	61-113	
Benzene	0.25	0.22	87	65-118	
1,2-Dichloroethane (EDC)	0.25	0.22	87	67-138	
Trichloroethene (TCE)	0.25	0.29	115	67-121	
1,2-Dichloropropane	0.25	0.21	83	51-140	
Dibromomethane	0.25	0.25	102	64-140	
Bromodichloromethane	0.25	0.36	145	67-153	
<i>cis</i> -1,3-Dichloropropene	0.25	0.15	58	56-105	
Toluene	0.25	0.23	92	68-125	
Trans-1,3-Dichloropropene	0.25	0.13	51	63-109	L
1,1,2-Trichloroethane	0.25	0.21	84	65-152	
Tetrachloroethene (PCE)	0.25	0.40	159	46-159	
1,3-Dichloropropane	0.25	0.16	63	62-121	
Dibromochloromethane	0.25	0.36	144	48-181	
1,2-Dibromoethane (EDB)	0.25	0.18	73	53-146	
Chlorobenzene	0.25	0.29	116	62-151	
Ethylbenzene	0.25	0.21	83	49-144	
1,1,1,2-Tetrachloroethane	0.25	0.40	162	53-197	
Total Xylenes	0.75	0.62	83	38-140	
Styrene	0.25	0.19	76	52-134	

# Libby Environmental, Inc.

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 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K124

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Laboratory Control Sample

Date Analyzed: 12/3/2022					
	Spiked Conc. (mg/kg)	LCS Response (mg/kg)	LCS Recovery (%)	Recovery Limits (%)	Data Flag
Bromoform	0.25	0.43	171	29-218	
Isopropylbenzene	0.25	0.19	75	58-136	
1,1,2,2-Tetrachloroethane	0.25	0.15	60	55-168	
Bromobenzene	0.25	0.24	97	74-120	
n-Propylbenzene	0.25	0.17	69	64-120	
1,2,3-Trichloropropane	0.25	0.17	70	62-153	
2-Chlorotoluene	0.25	0.17	68	67-120	
1,3,5-Trimethylbenzene	0.25	0.18	73	61-124	
4-Chlorotoluene	0.25	0.18	71	65-116	
tert-Butylbenzene	0.25	0.17	68	56-128	
1,2,4-Trimethylbenzene	0.25	0.17	68	62-122	
sec-Butylbenzene	0.25	0.19	75	68-130	
Isopropyltoluene	0.25	0.19	75	55-132	
1,3-Dichlorobenzene	0.25	0.28	112	75-133	
1,4-Dichlorobenzene	0.25	0.28	113	83-128	
n-Butylbenzene	0.25	0.19	76	62-125	
1,2-Dichlorobenzene	0.25	0.23	91	73-129	
1,2-Dibromo-3-Chloropropane	0.25	0.16	66	33-155	
1,2,4-Trichlorobenzene	0.25	0.14	55	62-145	L
Hexachloro-1,3-butadiene	0.25	0.31	122	37-220	
Naphthalene	0.25	0.13	53	50-133	
1,2,3-Trichlorobenzene	0.25	0.16	62	70-159	
Surrogate Recovery					
Dibromofluoromethane			129	27-188	
1,2-Dichloroethane-d4			86	17-212	
Toluene-d8			88	41-142	
4-Bromofluorobenzene			84	47-167	

"L" Spike recovery is outside acceptance limits (Low Bias). Samples will be qualified with a \*.

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

3322 South Bay Road NE

Olympia, WA 98506

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SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K124

## Analyses of Gasoline (NWTPH-Gx) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Gasoline (mg/kg)
Method Blank	12/3/2022	85	nd
WB-SO-SD70-0005	12/3/2022	88	nd
WB-SO-SD71-0005	12/3/2022	85	nd
WB-SO-SD72-0005	12/3/2022	85	nd
WB-SO-SD72-1005	12/3/2022	84	nd
WB-SO-SD73-0005	12/3/2022	85	nd
WB-SO-SD74-0005	12/3/2022	81	nd
WB-SO-SD75-0005	12/3/2022	81	nd
WB-SO-SD75-0005 Dup	12/3/2022	89	nd
Practical Quantitation Limit			30

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (Toluene-d8): 41% TO 142%

ANALYSES PERFORMED BY: Sherry Chilcutt

# Libby Environmental, Inc.

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SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K124

## Analyses of Diesel & Oil (NWTPH-Dx/Dx Extended) in Soil

Sample Number	Date Analyzed	Surrogate Recovery (%)	Diesel (mg/kg)	Oil (mg/kg)
Method Blank	12/1/2022	103	nd	nd
WB-SO-SD70-0005	12/1/2022	89	nd	nd
WB-SO-SD71-0005	12/1/2022	99	nd	nd
WB-SO-SD72-0005	12/1/2022	91	nd	nd
WB-SO-SD72-1005	12/2/2022	98	nd	nd
WB-SO-SD73-0005	12/1/2022	99	nd	nd
WB-SO-SD74-0005	12/1/2022	86	nd	nd
WB-SO-SD75-0005	12/2/2022	94	nd	nd
Practical Quantitation Limit			50	250

"nd" Indicates not detected at the listed detection limits.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE (2-F Biphenyl): 65% TO 135%

ANALYSES PERFORMED BY: Lucy Owens

# Libby Environmental, Inc.

SOLID WOOD INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K122

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	Method Blank	LCS	WB-SO- SD70-0005	WB-SO- SD71-0005	WB-SO- SD72-0005	WB-SO- SD72-1005
Date Sampled		N/A	N/A	11/30/2022	11/30/2022	11/30/2022	11/30/2022
Date Analyzed		12/3/2022	12/3/2022	12/3/2022	12/3/2022	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	nd	104%	nd	nd	nd	nd
Aroclor 1221	0.1	nd		nd	nd	nd	nd
Aroclor 1232	0.1	nd		nd	nd	nd	nd
Aroclor 1242	0.1	nd		nd	nd	nd	nd
Aroclor 1248	0.1	nd		nd	nd	nd	nd
Aroclor 1254	0.1	nd		nd	nd	nd	nd
Aroclor 1260	0.1	nd	99%	nd	nd	nd	nd

### Surrogate Recovery

TCMX	105	101	104	123	99	82
DCBP	99	97	95	79	98	78

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Paul Burke

# Libby Environmental, Inc.

SOLID WOOD INC. PROJECT  
 Pioneer Technologies Corp.  
 Olympia, Washington  
 Libby Project # L22K122

3322 South Bay Road NE  
 Olympia, WA 98506  
 Phone: (360) 352-2110  
 FAX: (360) 352-4154  
 Email: libbyenv@gmail.com

## Analyses of PCB (Polychlorinated Biphenyls) in Soil by EPA Method 8082

Sample Description	PQL	WB-SO- SD73-0005	WB-SO- SD74-0005	WB-SO- SD75-0005	L22K122 MS	L22K122 MSD
Date Sampled		11/30/2022	11/30/2022	11/30/2022	11/29/2022	11/29/2022
Date Analyzed		12/3/2022	12/3/2022	12/3/2022	12/3/2022	12/3/2022
	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
Aroclor 1016	0.1	nd	nd	nd	106%	109%
Aroclor 1221	0.1	nd	nd	nd		
Aroclor 1232	0.1	nd	nd	nd		
Aroclor 1242	0.1	nd	nd	nd		
Aroclor 1248	0.1	nd	nd	nd		
Aroclor 1254	0.1	nd	nd	nd		
Aroclor 1260	0.1	nd	nd	nd	111%	109%
<b>Surrogate Recovery</b>						
TCMX		109	97	114	100	116
DCBP		109	76	96	91	97

"nd" Indicates not detected at listed detection limit.

"int" Indicates that interference prevents determination.

ACCEPTABLE RECOVERY LIMITS FOR SURROGATE 65% TO 135%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%

ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Paul Burke



# Libby Environmental, Inc.

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SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Olympia, Washington  
Libby Project # L22K124

## Analyses of Total Mercury in Soil by EPA Method 7471

Sample Number	Date Analyzed	Mercury (mg/kg)
Method Blank	12/7/2022	nd
WB-SO-SD70-0005	12/7/2022	nd
WB-SO-SD70-0005 Dup	12/7/2022	nd
WB-SO-SD71-0005	12/7/2022	nd
WB-SO-SD72-0005	12/7/2022	nd
WB-SO-SD72-1005	12/7/2022	nd
WB-SO-SD73-0005	12/7/2022	nd
WB-SO-SD74-0005	12/7/2022	nd
WB-SO-SD75-0005	12/7/2022	nd
Practical Quantitation Limit		0.5

"nd" Indicates not detected at the listed detection limits.

ANALYSES PERFORMED BY: Randolph Kraus

## QA/QC for Total Mercury by EPA Method 7471

Sample Number	Date Analyzed	Mercury (% Recovery)
LCS	12/7/2022	83%
WB-SO-SD70-0005 MS	12/7/2022	86%
WB-SO-SD70-0005 MSD	12/7/2022	94%
RPD		9%

ACCEPTABLE RECOVERY LIMITS FOR MATRIX SPIKES: 75%-125%  
ACCEPTABLE RPD IS 20%

ANALYSES PERFORMED BY: Randolph Kraus

# Libby Environmental, Inc.

3322 South Bay Road NE

Olympia, WA 98506

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SOLID WOOD INC. PROJECT

Pioneer Technologies Corp.

Olympia, Washington

Libby Project # L22K124

## Analysis of pH by Standard Method 4500-H+

Sample Number	Date Analyzed	pH
WB-SO-SD70-0005	12/1/2022	7.50
WB-SO-SD70-0005 Dup	12/1/2022	7.70
WB-SO-SD71-0005	12/1/2022	7.70
WB-SO-SD72-0005	12/1/2022	7.80
WB-SO-SD72-1005	12/1/2022	7.80
WB-SO-SD73-0005	12/1/2022	7.70
WB-SO-SD74-0005	12/1/2022	7.70
WB-SO-SD75-0005	12/1/2022	7.80

ANALYSES PERFORMED BY: Kory Dixon

# Libby Environmental, Inc.

3322 South Bay Road NE

Olympia, WA 98506

Phone: (360) 352-2110

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Email: libbyenv@gmail.com

SOLID WOOD INC. PROJECT  
Pioneer Technologies Corp.  
Libby Project # L22K124  
Date Received 11/30/22 14:20

Received By PB

## Sample Receipt Checklist

### Chain of Custody

1. Is the Chain of Custody complete?  Yes  No
2. How was the sample delivered?  Hand Delivered  Picked Up  Shipped

### Log In

3. Cooler or Shipping Container is present.  Yes  No  N/A
4. Cooler or Shipping Container is in good condition.  Yes  No  N/A
5. Cooler or Shipping Container has Custody Seals present.  Yes  No  N/A
6. Was an attempt made to cool the samples?  Yes  No  N/A
7. Temperature of cooler (0°C to 8°C recommended) 0.3 °C
8. Temperature of sample(s) (0°C to 8°C recommended) 7.6 °C
9. Did all containers arrive in good condition (unbroken)?  Yes  No
10. Is it clear what analyses were requested?  Yes  No
11. Did container labels match Chain of Custody?  Yes  No
12. Are matrices correctly identified on Chain of Custody?  Yes  No
13. Are correct containers used for the analysis indicated?  Yes  No
14. Is there sufficient sample volume for indicated analysis?  Yes  No
15. Were all containers properly preserved per each analysis?  Yes  No
16. Were VOA vials collected correctly (no headspace)?  Yes  No  N/A
17. Were all holding times able to be met?  Yes  No

### Discrepancies/ Notes

18. Was client notified of all discrepancies?  Yes  No  N/A

Person Notified: Hannah Morse

Date: 11/30/2022

By Whom: Sherry

Via: email

Regarding: VOAs

19. Comments. VOAs were filled completely with soil
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_



3600 Fremont Ave. N.  
Seattle, WA 98103  
T: (206) 352-3790  
F: (206) 352-7178  
info@fremontanalytical.com

**Libby Environmental**  
Sherry Chilcutt  
3322 South Bay Road NE  
Olympia, WA 98506

**RE: Solid Wood Inc.**  
**Work Order Number: 2212039**

February 01, 2023

**Attention Sherry Chilcutt:**

Fremont Analytical, Inc. received 7 sample(s) on 12/1/2022 for the analyses presented in the following report.

- Grain Size by ASTM D422***
- Sample Moisture (Percent Moisture)***
- Semivolatile Organic Compounds by EPA Method 8270***
- Total Metals by EPA Method 6020B***
- Total Organic Carbon by EPA 9060***

This report consists of the following:

- Case Narrative
- Analytical Results
- Applicable Quality Control Summary Reports
- Chain of Custody

All analyses were performed consistent with the Quality Assurance program of Fremont Analytical, Inc. Please contact the laboratory if you should have any questions about the results.

Thank you for using Fremont Analytical.

Sincerely,

Brianna Barnes  
Project Manager

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.3 for Environmental Testing  
ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing  
Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

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Original



Date: 02/01/2023

**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.  
**Work Order:** 2212039

## Work Order Sample Summary

Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received
2212039-001	WB-SO-SD70-0005	11/30/2022 8:30 AM	12/01/2022 2:21 PM
2212039-002	WB-SO-SD71-0005	11/30/2022 9:05 AM	12/01/2022 2:21 PM
2212039-003	WB-SO-SD72-0005	11/30/2022 10:25 AM	12/01/2022 2:21 PM
2212039-004	WB-SO-SD72-1005	11/30/2022 10:25 AM	12/01/2022 2:21 PM
2212039-005	WB-SO-SD73-0005	11/30/2022 9:35 AM	12/01/2022 2:21 PM
2212039-006	WB-SO-SD74-0005	11/30/2022 11:15 AM	12/01/2022 2:21 PM
2212039-007	WB-SO-SD75-0005	11/30/2022 11:45 AM	12/01/2022 2:21 PM

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

---

**CLIENT:** Libby Environmental**Project:** Solid Wood Inc.

---

**I. SAMPLE RECEIPT:**

Samples receipt information is recorded on the attached Sample Receipt Checklist.

**II. GENERAL REPORTING COMMENTS:**

Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

**III. ANALYSES AND EXCEPTIONS:**

Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

2212039-001B

PHY-GRAIN has been Sub Contracted.

2212039-002B

PHY-GRAIN has been Sub Contracted.

2212039-003B

PHY-GRAIN has been Sub Contracted.

2212039-004B

PHY-GRAIN has been Sub Contracted.

2212039-005B

PHY-GRAIN has been Sub Contracted.

2212039-006B

PHY-GRAIN has been Sub Contracted.

2212039-007B

PHY-GRAIN has been Sub Contracted.

## Qualifiers:

- \* - Associated LCS is outside of control limits
- B - Analyte detected in the associated Method Blank
- D - Dilution was required
- E - Value above quantitation range
- H - Holding times for preparation or analysis exceeded
- I - Analyte with an internal standard that does not meet established acceptance criteria
- J - Analyte detected below Reporting Limit
- N - Tentatively Identified Compound (TIC)
- Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
- S - Spike recovery outside accepted recovery limits
- ND - Not detected at the Method Detection Limit
- R - High relative percent difference observed

## Acronyms:

- %Rec - Percent Recovery
- CCB - Continued Calibration Blank
- CCV - Continued Calibration Verification
- DF - Dilution Factor
- DUP - Sample Duplicate
- HEM - Hexane Extractable Material
- ICV - Initial Calibration Verification
- LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
- MCL - Maximum Contaminant Level
- MB or MBLANK - Method Blank
- MDL - Method Detection Limit
- MS/MSD - Matrix Spike / Matrix Spike Duplicate
- PDS - Post Digestion Spike
- Ref Val - Reference Value
- REP - Sample Replicate
- RL - Reporting Limit
- RPD - Relative Percent Difference
- SD - Serial Dilution
- SGT - Silica Gel Treatment
- SPK - Spike
- Surr - Surrogate





# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 8:30:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-001

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD70-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
Phenol	ND	47.2	12.4		µg/Kg-dry	1	12/19/22 19:15:40
Bis(2-chloroethyl) ether	ND	78.6	24.1		µg/Kg-dry	1	12/19/22 19:15:40
2-Chlorophenol	ND	62.9	22.7		µg/Kg-dry	1	12/19/22 19:15:40
1,3-Dichlorobenzene	ND	62.9	25.8		µg/Kg-dry	1	12/19/22 19:15:40
1,4-Dichlorobenzene	ND	47.2	20.3		µg/Kg-dry	1	12/19/22 19:15:40
1,2-Dichlorobenzene	ND	62.9	20.8		µg/Kg-dry	1	12/19/22 19:15:40
Benzyl alcohol	ND	236	90.5	Q	µg/Kg-dry	1	12/19/22 19:15:40
2-Methylphenol (o-cresol)	ND	62.9	24.5		µg/Kg-dry	1	12/19/22 19:15:40
Hexachloroethane	ND	62.9	19.8		µg/Kg-dry	1	12/19/22 19:15:40
N-Nitrosodi-n-propylamine	ND	126	43.2		µg/Kg-dry	1	12/19/22 19:15:40
3&4-Methylphenol (m, p-cresol)	ND	47.2	20.3		µg/Kg-dry	1	12/19/22 19:15:40
Nitrobenzene	ND	78.6	24.0		µg/Kg-dry	1	12/19/22 19:15:40
Isophorone	ND	62.9	20.5		µg/Kg-dry	1	12/19/22 19:15:40
2-Nitrophenol	ND	47.2	20.2		µg/Kg-dry	1	12/19/22 19:15:40
2,4-Dimethylphenol	ND	47.2	9.20		µg/Kg-dry	1	12/19/22 19:15:40
Bis(2-chloroethoxy)methane	ND	47.2	8.90		µg/Kg-dry	1	12/19/22 19:15:40
2,4-Dichlorophenol	ND	47.2	6.93		µg/Kg-dry	1	12/19/22 19:15:40
1,2,4-Trichlorobenzene	ND	47.2	17.6		µg/Kg-dry	1	12/19/22 19:15:40
Naphthalene	32.0	62.9	19.2	J	µg/Kg-dry	1	12/19/22 19:15:40
4-Chloroaniline	ND	47.2	14.0		µg/Kg-dry	1	12/19/22 19:15:40
Hexachlorobutadiene	ND	47.2	13.7		µg/Kg-dry	1	12/19/22 19:15:40
4-Chloro-3-methylphenol	ND	47.2	17.9		µg/Kg-dry	1	12/19/22 19:15:40
2-Methylnaphthalene	ND	47.2	11.5		µg/Kg-dry	1	12/19/22 19:15:40
1-Methylnaphthalene	ND	47.2	8.07		µg/Kg-dry	1	12/19/22 19:15:40
Hexachlorocyclopentadiene	ND	157	34.9		µg/Kg-dry	1	12/16/22 9:28:21
2,4,6-Trichlorophenol	ND	47.2	19.9		µg/Kg-dry	1	12/19/22 19:15:40
2,4,5-Trichlorophenol	ND	47.2	13.9		µg/Kg-dry	1	12/19/22 19:15:40
2-Chloronaphthalene	ND	47.2	9.98		µg/Kg-dry	1	12/19/22 19:15:40
2-Nitroaniline	ND	78.6	31.2		µg/Kg-dry	1	12/19/22 19:15:40
Acenaphthene	ND	47.2	11.0		µg/Kg-dry	1	12/19/22 19:15:40
Dimethylphthalate	ND	5,500	2,540		µg/Kg-dry	1	12/19/22 19:15:40

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 8:30:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-001

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD70-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

2,6-Dinitrotoluene	ND	62.9	22.7		µg/Kg-dry	1	12/19/22 19:15:40
Acenaphthylene	ND	47.2	9.85		µg/Kg-dry	1	12/19/22 19:15:40
2,4-Dinitrophenol	ND	472	203	Q	µg/Kg-dry	1	12/19/22 19:15:40
Dibenzofuran	ND	47.2	9.40		µg/Kg-dry	1	12/19/22 19:15:40
2,4-Dinitrotoluene	ND	94.3	38.1		µg/Kg-dry	1	12/19/22 19:15:40
4-Nitrophenol	ND	314	84.8		µg/Kg-dry	1	12/19/22 19:15:40
Fluorene	ND	47.2	7.86		µg/Kg-dry	1	12/19/22 19:15:40
4-Chlorophenyl phenyl ether	ND	47.2	12.8		µg/Kg-dry	1	12/19/22 19:15:40
Diethylphthalate	ND	1,180	378		µg/Kg-dry	1	12/19/22 19:15:40
4,6-Dinitro-2-methylphenol	ND	393	172	Q	µg/Kg-dry	1	12/19/22 19:15:40
4-Bromophenyl phenyl ether	ND	47.2	18.5		µg/Kg-dry	1	12/19/22 19:15:40
Hexachlorobenzene	ND	47.2	9.20		µg/Kg-dry	1	12/19/22 19:15:40
Pentachlorophenol	ND	314	113		µg/Kg-dry	1	12/19/22 19:15:40
Phenanthrene	17.7	47.2	12.4	J	µg/Kg-dry	1	12/19/22 19:15:40
Anthracene	ND	47.2	8.71		µg/Kg-dry	1	12/19/22 19:15:40
Carbazole	ND	47.2	10.2		µg/Kg-dry	1	12/19/22 19:15:40
Di-n-butylphthalate	ND	47.2	17.0		µg/Kg-dry	1	12/19/22 19:15:40
Fluoranthene	31.7	47.2	13.9	J	µg/Kg-dry	1	12/19/22 19:15:40
Pyrene	ND	236	75.2		µg/Kg-dry	1	12/19/22 19:15:40
Butyl Benzylphthalate	ND	78.6	23.2		µg/Kg-dry	1	12/19/22 19:15:40
bis(2-Ethylhexyl)adipate	ND	314	116		µg/Kg-dry	1	12/16/22 9:28:21
Benz(a)anthracene	20.6	47.2	12.7	J	µg/Kg-dry	1	12/19/22 19:15:40
Chrysene	ND	78.6	18.1		µg/Kg-dry	1	12/19/22 19:15:40
bis (2-Ethylhexyl) phthalate	ND	62.9	17.7		µg/Kg-dry	1	12/16/22 9:28:21
Di-n-octyl phthalate	ND	118	29.3		µg/Kg-dry	1	12/16/22 9:28:21
Benzo(b)fluoranthene	ND	157	16.6		µg/Kg-dry	1	12/19/22 19:15:40
Benzo(k)fluoranthene	ND	47.2	15.8		µg/Kg-dry	1	12/19/22 19:15:40
Benzo(a)pyrene	ND	62.9	22.9		µg/Kg-dry	1	12/19/22 19:15:40
Indeno(1,2,3-cd)pyrene	ND	314	109		µg/Kg-dry	1	12/19/22 19:15:40
Dibenz(a,h)anthracene	ND	157	61.2		µg/Kg-dry	1	12/19/22 19:15:40
Benzo(g,h,i)perylene	ND	157	45.5		µg/Kg-dry	1	12/19/22 19:15:40

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 8:30:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-001

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD70-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

Surr: 2,4,6-Tribromophenol	77.9	16.2 - 150	0		%Rec	1	12/19/22 19:15:40
Surr: 2-Fluorobiphenyl	74.9	25.3 - 139	0		%Rec	1	12/19/22 19:15:40
Surr: Nitrobenzene-d5	65.9	12.7 - 143	0		%Rec	1	12/19/22 19:15:40
Surr: Phenol-d6	65.9	21.4 - 139	0		%Rec	1	12/19/22 19:15:40
Surr: p-Terphenyl	74.6	37.1 - 144	0		%Rec	1	12/19/22 19:15:40

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38718

Analyst: EH

Arsenic	6.06	0.293	0.0599		mg/Kg-dry	1	12/06/22 15:11:00
Cadmium	0.427	0.0234	0.00682		mg/Kg-dry	1	12/06/22 15:11:00
Chromium	18.2	0.293	0.0646		mg/Kg-dry	1	12/06/22 15:11:00
Copper	20.7	0.879	0.249		mg/Kg-dry	1	12/06/22 15:11:00
Lead	6.02	1.17	0.0412		mg/Kg-dry	1	12/06/22 15:11:00
Silver	0.0914	0.0234	0.00560		mg/Kg-dry	1	12/06/22 15:11:00
Zinc	49.4	4.10	1.30		mg/Kg-dry	1	12/06/22 15:11:00

**Sample Moisture (Percent Moisture)**

Batch ID: R80307

Analyst: CO

Percent Moisture	39.9	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858

Analyst: AT

Total Organic Carbon	0.802	0.150	0.0412		%-dry	1	12/20/22 11:31:00
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# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 9:05:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD71-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
Phenol	3,100	47.1	12.4		µg/Kg-dry	1	12/19/22 19:45:27
Bis(2-chloroethyl) ether	ND	78.4	24.0		µg/Kg-dry	1	12/19/22 19:45:27
2-Chlorophenol	ND	62.7	22.6		µg/Kg-dry	1	12/19/22 19:45:27
1,3-Dichlorobenzene	ND	62.7	25.7		µg/Kg-dry	1	12/19/22 19:45:27
1,4-Dichlorobenzene	ND	47.1	20.3		µg/Kg-dry	1	12/19/22 19:45:27
1,2-Dichlorobenzene	ND	62.7	20.8		µg/Kg-dry	1	12/19/22 19:45:27
Benzyl alcohol	ND	235	90.3	Q	µg/Kg-dry	1	12/19/22 19:45:27
2-Methylphenol (o-cresol)	ND	62.7	24.5		µg/Kg-dry	1	12/19/22 19:45:27
Hexachloroethane	ND	62.7	19.7		µg/Kg-dry	1	12/19/22 19:45:27
N-Nitrosodi-n-propylamine	ND	125	43.1		µg/Kg-dry	1	12/19/22 19:45:27
3&4-Methylphenol (m, p-cresol)	74.7	47.1	20.3		µg/Kg-dry	1	12/19/22 19:45:27
Nitrobenzene	ND	78.4	24.0		µg/Kg-dry	1	12/19/22 19:45:27
Isophorone	ND	62.7	20.5		µg/Kg-dry	1	12/19/22 19:45:27
2-Nitrophenol	ND	47.1	20.1		µg/Kg-dry	1	12/19/22 19:45:27
2,4-Dimethylphenol	ND	47.1	9.19		µg/Kg-dry	1	12/19/22 19:45:27
Bis(2-chloroethoxy)methane	ND	47.1	8.89		µg/Kg-dry	1	12/19/22 19:45:27
2,4-Dichlorophenol	ND	47.1	6.92		µg/Kg-dry	1	12/19/22 19:45:27
1,2,4-Trichlorobenzene	ND	47.1	17.6		µg/Kg-dry	1	12/19/22 19:45:27
Naphthalene	ND	62.7	19.2		µg/Kg-dry	1	12/19/22 19:45:27
4-Chloroaniline	ND	47.1	14.0		µg/Kg-dry	1	12/19/22 19:45:27
Hexachlorobutadiene	ND	47.1	13.7		µg/Kg-dry	1	12/19/22 19:45:27
4-Chloro-3-methylphenol	ND	47.1	17.9		µg/Kg-dry	1	12/19/22 19:45:27
2-Methylnaphthalene	ND	47.1	11.5		µg/Kg-dry	1	12/19/22 19:45:27
1-Methylnaphthalene	ND	47.1	8.05		µg/Kg-dry	1	12/19/22 19:45:27
Hexachlorocyclopentadiene	ND	157	34.8		µg/Kg-dry	1	12/16/22 9:58:33
2,4,6-Trichlorophenol	ND	47.1	19.9		µg/Kg-dry	1	12/19/22 19:45:27
2,4,5-Trichlorophenol	ND	47.1	13.9		µg/Kg-dry	1	12/19/22 19:45:27
2-Chloronaphthalene	ND	47.1	9.95		µg/Kg-dry	1	12/19/22 19:45:27
2-Nitroaniline	ND	78.4	31.2		µg/Kg-dry	1	12/19/22 19:45:27
Acenaphthene	ND	47.1	11.0		µg/Kg-dry	1	12/19/22 19:45:27
Dimethylphthalate	ND	5,490	2,530		µg/Kg-dry	1	12/19/22 19:45:27

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 9:05:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD71-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

2,6-Dinitrotoluene	ND	62.7	22.7		µg/Kg-dry	1	12/19/22 19:45:27
Acenaphthylene	ND	47.1	9.83		µg/Kg-dry	1	12/19/22 19:45:27
2,4-Dinitrophenol	ND	471	202	Q	µg/Kg-dry	1	12/19/22 19:45:27
Dibenzofuran	ND	47.1	9.38		µg/Kg-dry	1	12/19/22 19:45:27
2,4-Dinitrotoluene	ND	94.1	38.0		µg/Kg-dry	1	12/19/22 19:45:27
4-Nitrophenol	ND	314	84.6		µg/Kg-dry	1	12/19/22 19:45:27
Fluorene	ND	47.1	7.84		µg/Kg-dry	1	12/19/22 19:45:27
4-Chlorophenyl phenyl ether	ND	47.1	12.7		µg/Kg-dry	1	12/19/22 19:45:27
Diethylphthalate	ND	1,180	377		µg/Kg-dry	1	12/19/22 19:45:27
4,6-Dinitro-2-methylphenol	ND	392	172	Q	µg/Kg-dry	1	12/19/22 19:45:27
4-Bromophenyl phenyl ether	ND	47.1	18.5		µg/Kg-dry	1	12/19/22 19:45:27
Hexachlorobenzene	ND	47.1	9.18		µg/Kg-dry	1	12/19/22 19:45:27
Pentachlorophenol	ND	314	112		µg/Kg-dry	1	12/19/22 19:45:27
Phenanthrene	23.4	47.1	12.4	J	µg/Kg-dry	1	12/19/22 19:45:27
Anthracene	ND	47.1	8.70		µg/Kg-dry	1	12/19/22 19:45:27
Carbazole	ND	47.1	10.1		µg/Kg-dry	1	12/19/22 19:45:27
Di-n-butylphthalate	ND	47.1	17.0		µg/Kg-dry	1	12/19/22 19:45:27
Fluoranthene	37.1	47.1	13.8	J	µg/Kg-dry	1	12/19/22 19:45:27
Pyrene	ND	235	75.1		µg/Kg-dry	1	12/19/22 19:45:27
Butyl Benzylphthalate	ND	78.4	23.1		µg/Kg-dry	1	12/19/22 19:45:27
bis(2-Ethylhexyl)adipate	ND	314	115		µg/Kg-dry	1	12/16/22 9:58:33
Benz(a)anthracene	21.4	47.1	12.7	J	µg/Kg-dry	1	12/19/22 19:45:27
Chrysene	ND	78.4	18.0		µg/Kg-dry	1	12/19/22 19:45:27
bis (2-Ethylhexyl) phthalate	ND	62.7	17.7		µg/Kg-dry	1	12/16/22 9:58:33
Di-n-octyl phthalate	ND	118	29.3		µg/Kg-dry	1	12/16/22 9:58:33
Benzo(b)fluoranthene	ND	157	16.6		µg/Kg-dry	1	12/19/22 19:45:27
Benzo(k)fluoranthene	ND	47.1	15.7		µg/Kg-dry	1	12/19/22 19:45:27
Benzo(a)pyrene	ND	62.7	22.8		µg/Kg-dry	1	12/19/22 19:45:27
Indeno(1,2,3-cd)pyrene	ND	314	108		µg/Kg-dry	1	12/19/22 19:45:27
Dibenz(a,h)anthracene	ND	157	61.0		µg/Kg-dry	1	12/19/22 19:45:27
Benzo(g,h,i)perylene	ND	157	45.4		µg/Kg-dry	1	12/19/22 19:45:27

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 9:05:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-002

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD71-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

Surr: 2,4,6-Tribromophenol	87.8	16.2 - 150	0		%Rec	1	12/19/22 19:45:27
Surr: 2-Fluorobiphenyl	84.2	25.3 - 139	0		%Rec	1	12/19/22 19:45:27
Surr: Nitrobenzene-d5	70.4	12.7 - 143	0		%Rec	1	12/19/22 19:45:27
Surr: Phenol-d6	74.0	21.4 - 139	0		%Rec	1	12/19/22 19:45:27
Surr: p-Terphenyl	82.7	37.1 - 144	0		%Rec	1	12/19/22 19:45:27

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38718

Analyst: EH

Arsenic	4.23	0.305	0.0623		mg/Kg-dry	1	12/06/22 15:14:00
Cadmium	0.263	0.0244	0.00709		mg/Kg-dry	1	12/06/22 15:14:00
Chromium	18.6	0.305	0.0672		mg/Kg-dry	1	12/06/22 15:14:00
Copper	19.4	0.915	0.259		mg/Kg-dry	1	12/06/22 15:14:00
Lead	4.90	1.22	0.0429		mg/Kg-dry	1	12/06/22 15:14:00
Silver	0.0653	0.0244	0.00583		mg/Kg-dry	1	12/06/22 15:14:00
Zinc	42.8	4.27	1.35		mg/Kg-dry	1	12/06/22 15:14:00

**Sample Moisture (Percent Moisture)**

Batch ID: R80307

Analyst: CO

Percent Moisture	42.7	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858

Analyst: AT

Total Organic Carbon	1.41	0.150	0.0412		%-dry	1	12/20/22 11:43:00
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# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 10:25:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD72-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
Phenol	ND	65.7	17.3		µg/Kg-dry	1	12/19/22 20:15:23
Bis(2-chloroethyl) ether	ND	110	33.5		µg/Kg-dry	1	12/19/22 20:15:23
2-Chlorophenol	ND	87.6	31.6		µg/Kg-dry	1	12/19/22 20:15:23
1,3-Dichlorobenzene	ND	87.6	35.9		µg/Kg-dry	1	12/19/22 20:15:23
1,4-Dichlorobenzene	ND	65.7	28.3		µg/Kg-dry	1	12/19/22 20:15:23
1,2-Dichlorobenzene	ND	87.6	29.0		µg/Kg-dry	1	12/19/22 20:15:23
Benzyl alcohol	ND	329	126	Q	µg/Kg-dry	1	12/19/22 20:15:23
2-Methylphenol (o-cresol)	ND	87.6	34.2		µg/Kg-dry	1	12/19/22 20:15:23
Hexachloroethane	ND	87.6	27.6		µg/Kg-dry	1	12/19/22 20:15:23
N-Nitrosodi-n-propylamine	ND	175	60.2		µg/Kg-dry	1	12/19/22 20:15:23
3&4-Methylphenol (m, p-cresol)	ND	65.7	28.3		µg/Kg-dry	1	12/19/22 20:15:23
Nitrobenzene	ND	110	33.5		µg/Kg-dry	1	12/19/22 20:15:23
Isophorone	ND	87.6	28.6		µg/Kg-dry	1	12/19/22 20:15:23
2-Nitrophenol	ND	65.7	28.1		µg/Kg-dry	1	12/19/22 20:15:23
2,4-Dimethylphenol	ND	65.7	12.8		µg/Kg-dry	1	12/19/22 20:15:23
Bis(2-chloroethoxy)methane	ND	65.7	12.4		µg/Kg-dry	1	12/19/22 20:15:23
2,4-Dichlorophenol	ND	65.7	9.66		µg/Kg-dry	1	12/19/22 20:15:23
1,2,4-Trichlorobenzene	ND	65.7	24.6		µg/Kg-dry	1	12/19/22 20:15:23
Naphthalene	ND	87.6	26.8		µg/Kg-dry	1	12/19/22 20:15:23
4-Chloroaniline	ND	65.7	19.5		µg/Kg-dry	1	12/19/22 20:15:23
Hexachlorobutadiene	ND	65.7	19.1		µg/Kg-dry	1	12/19/22 20:15:23
4-Chloro-3-methylphenol	ND	65.7	25.0		µg/Kg-dry	1	12/19/22 20:15:23
2-Methylnaphthalene	ND	65.7	16.1		µg/Kg-dry	1	12/19/22 20:15:23
1-Methylnaphthalene	ND	65.7	11.2		µg/Kg-dry	1	12/19/22 20:15:23
Hexachlorocyclopentadiene	ND	219	48.6		µg/Kg-dry	1	12/16/22 10:28:52
2,4,6-Trichlorophenol	ND	65.7	27.7		µg/Kg-dry	1	12/19/22 20:15:23
2,4,5-Trichlorophenol	ND	65.7	19.4		µg/Kg-dry	1	12/19/22 20:15:23
2-Chloronaphthalene	ND	65.7	13.9		µg/Kg-dry	1	12/19/22 20:15:23
2-Nitroaniline	ND	110	43.5		µg/Kg-dry	1	12/19/22 20:15:23
Acenaphthene	ND	65.7	15.3		µg/Kg-dry	1	12/19/22 20:15:23
Dimethylphthalate	ND	7,670	3,540		µg/Kg-dry	1	12/19/22 20:15:23

Original





# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 10:25:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD72-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

2,6-Dinitrotoluene	ND	87.6	31.7		µg/Kg-dry	1	12/19/22 20:15:23
Acenaphthylene	ND	65.7	13.7		µg/Kg-dry	1	12/19/22 20:15:23
2,4-Dinitrophenol	ND	657	282	Q	µg/Kg-dry	1	12/19/22 20:15:23
Dibenzofuran	ND	65.7	13.1		µg/Kg-dry	1	12/19/22 20:15:23
2,4-Dinitrotoluene	ND	131	53.1		µg/Kg-dry	1	12/19/22 20:15:23
4-Nitrophenol	ND	438	118		µg/Kg-dry	1	12/19/22 20:15:23
Fluorene	ND	65.7	11.0		µg/Kg-dry	1	12/19/22 20:15:23
4-Chlorophenyl phenyl ether	ND	65.7	17.8		µg/Kg-dry	1	12/19/22 20:15:23
Diethylphthalate	ND	1,640	527		µg/Kg-dry	1	12/19/22 20:15:23
4,6-Dinitro-2-methylphenol	ND	548	240	Q	µg/Kg-dry	1	12/19/22 20:15:23
4-Bromophenyl phenyl ether	ND	65.7	25.8		µg/Kg-dry	1	12/19/22 20:15:23
Hexachlorobenzene	ND	65.7	12.8		µg/Kg-dry	1	12/19/22 20:15:23
Pentachlorophenol	ND	438	157		µg/Kg-dry	1	12/19/22 20:15:23
Phenanthrene	ND	65.7	17.3		µg/Kg-dry	1	12/19/22 20:15:23
Anthracene	ND	65.7	12.1		µg/Kg-dry	1	12/19/22 20:15:23
Carbazole	ND	65.7	14.2		µg/Kg-dry	1	12/19/22 20:15:23
Di-n-butylphthalate	ND	65.7	23.7		µg/Kg-dry	1	12/19/22 20:15:23
Fluoranthene	43.1	65.7	19.3	J	µg/Kg-dry	1	12/19/22 20:15:23
Pyrene	ND	329	105		µg/Kg-dry	1	12/19/22 20:15:23
Butyl Benzylphthalate	ND	110	32.3		µg/Kg-dry	1	12/19/22 20:15:23
bis(2-Ethylhexyl)adipate	ND	438	161		µg/Kg-dry	1	12/16/22 10:28:52
Benz(a)anthracene	29.6	65.7	17.7	J	µg/Kg-dry	1	12/19/22 20:15:23
Chrysene	ND	110	25.2		µg/Kg-dry	1	12/19/22 20:15:23
bis (2-Ethylhexyl) phthalate	ND	87.6	24.6		µg/Kg-dry	1	12/16/22 10:28:52
Di-n-octyl phthalate	ND	164	40.9		µg/Kg-dry	1	12/16/22 10:28:52
Benzo(b)fluoranthene	ND	219	23.2		µg/Kg-dry	1	12/19/22 20:15:23
Benzo(k)fluoranthene	ND	65.7	22.0		µg/Kg-dry	1	12/19/22 20:15:23
Benzo(a)pyrene	ND	87.6	31.8		µg/Kg-dry	1	12/19/22 20:15:23
Indeno(1,2,3-cd)pyrene	ND	438	151		µg/Kg-dry	1	12/19/22 20:15:23
Dibenz(a,h)anthracene	ND	219	85.2		µg/Kg-dry	1	12/19/22 20:15:23
Benzo(g,h,i)perylene	ND	219	63.4		µg/Kg-dry	1	12/19/22 20:15:23

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 10:25:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-003

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD72-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

Surr: 2,4,6-Tribromophenol	69.3	16.2 - 150	0		%Rec	1	12/19/22 20:15:23
Surr: 2-Fluorobiphenyl	64.4	25.3 - 139	0		%Rec	1	12/19/22 20:15:23
Surr: Nitrobenzene-d5	56.5	12.7 - 143	0		%Rec	1	12/19/22 20:15:23
Surr: Phenol-d6	57.1	21.4 - 139	0		%Rec	1	12/19/22 20:15:23
Surr: p-Terphenyl	64.5	37.1 - 144	0		%Rec	1	12/19/22 20:15:23

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38735

Analyst: EH

Arsenic	8.82	0.567	0.165		mg/Kg-dry	1	12/07/22 13:10:37
Cadmium	1.06	0.378	0.0144		mg/Kg-dry	1	12/07/22 13:10:37
Chromium	32.8	1.04	0.247		mg/Kg-dry	1	12/07/22 13:10:37
Copper	50.9	2.08	0.353		mg/Kg-dry	1	12/07/22 13:10:37
Lead	11.8	0.567	0.0786		mg/Kg-dry	1	12/07/22 13:10:37
Silver	0.210	0.189	0.0389		mg/Kg-dry	1	12/07/22 13:10:37
Zinc	83.3	3.30	1.15		mg/Kg-dry	1	12/07/22 13:10:37

**Sample Moisture (Percent Moisture)**

Batch ID: R80307

Analyst: CO

Percent Moisture	58.3	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858

Analyst: AT

Total Organic Carbon	2.17	0.150	0.0412		%-dry	1	12/20/22 12:08:00
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# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 10:25:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-004

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD72-1005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
Phenol	ND	69.7	18.4		µg/Kg-dry	1	12/19/22 20:45:11
Bis(2-chloroethyl) ether	ND	116	35.6		µg/Kg-dry	1	12/19/22 20:45:11
2-Chlorophenol	ND	93.0	33.6		µg/Kg-dry	1	12/19/22 20:45:11
1,3-Dichlorobenzene	ND	93.0	38.1		µg/Kg-dry	1	12/19/22 20:45:11
1,4-Dichlorobenzene	ND	69.7	30.0		µg/Kg-dry	1	12/19/22 20:45:11
1,2-Dichlorobenzene	ND	93.0	30.8		µg/Kg-dry	1	12/19/22 20:45:11
Benzyl alcohol	ND	349	134	Q	µg/Kg-dry	1	12/19/22 20:45:11
2-Methylphenol (o-cresol)	ND	93.0	36.2		µg/Kg-dry	1	12/19/22 20:45:11
Hexachloroethane	ND	93.0	29.3		µg/Kg-dry	1	12/19/22 20:45:11
N-Nitrosodi-n-propylamine	ND	186	63.9		µg/Kg-dry	1	12/19/22 20:45:11
3&4-Methylphenol (m, p-cresol)	43.4	69.7	30.0	J	µg/Kg-dry	1	12/19/22 20:45:11
Nitrobenzene	ND	116	35.5		µg/Kg-dry	1	12/19/22 20:45:11
Isophorone	ND	93.0	30.4		µg/Kg-dry	1	12/19/22 20:45:11
2-Nitrophenol	ND	69.7	29.8		µg/Kg-dry	1	12/19/22 20:45:11
2,4-Dimethylphenol	ND	69.7	13.6		µg/Kg-dry	1	12/19/22 20:45:11
Bis(2-chloroethoxy)methane	ND	69.7	13.2		µg/Kg-dry	1	12/19/22 20:45:11
2,4-Dichlorophenol	ND	69.7	10.2		µg/Kg-dry	1	12/19/22 20:45:11
1,2,4-Trichlorobenzene	ND	69.7	26.1		µg/Kg-dry	1	12/19/22 20:45:11
Naphthalene	ND	93.0	28.4		µg/Kg-dry	1	12/19/22 20:45:11
4-Chloroaniline	ND	69.7	20.7		µg/Kg-dry	1	12/19/22 20:45:11
Hexachlorobutadiene	ND	69.7	20.2		µg/Kg-dry	1	12/19/22 20:45:11
4-Chloro-3-methylphenol	ND	69.7	26.5		µg/Kg-dry	1	12/19/22 20:45:11
2-Methylnaphthalene	ND	69.7	17.1		µg/Kg-dry	1	12/19/22 20:45:11
1-Methylnaphthalene	ND	69.7	11.9		µg/Kg-dry	1	12/19/22 20:45:11
Hexachlorocyclopentadiene	ND	232	51.5		µg/Kg-dry	1	12/16/22 10:58:59
2,4,6-Trichlorophenol	ND	69.7	29.4		µg/Kg-dry	1	12/19/22 20:45:11
2,4,5-Trichlorophenol	ND	69.7	20.6		µg/Kg-dry	1	12/19/22 20:45:11
2-Chloronaphthalene	ND	69.7	14.8		µg/Kg-dry	1	12/19/22 20:45:11
2-Nitroaniline	ND	116	46.2		µg/Kg-dry	1	12/19/22 20:45:11
Acenaphthene	ND	69.7	16.2		µg/Kg-dry	1	12/19/22 20:45:11
Dimethylphthalate	ND	8,140	3,750		µg/Kg-dry	1	12/19/22 20:45:11

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 10:25:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-004

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD72-1005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
2,6-Dinitrotoluene	ND	93.0	33.6		µg/Kg-dry	1	12/19/22 20:45:11
Acenaphthylene	ND	69.7	14.6		µg/Kg-dry	1	12/19/22 20:45:11
2,4-Dinitrophenol	ND	697	300	Q	µg/Kg-dry	1	12/19/22 20:45:11
Dibenzofuran	ND	69.7	13.9		µg/Kg-dry	1	12/19/22 20:45:11
2,4-Dinitrotoluene	ND	139	56.3		µg/Kg-dry	1	12/19/22 20:45:11
4-Nitrophenol	ND	465	125		µg/Kg-dry	1	12/19/22 20:45:11
Fluorene	13.8	69.7	11.6	J	µg/Kg-dry	1	12/19/22 20:45:11
4-Chlorophenyl phenyl ether	ND	69.7	18.9		µg/Kg-dry	1	12/19/22 20:45:11
Diethylphthalate	ND	1,740	559		µg/Kg-dry	1	12/19/22 20:45:11
4,6-Dinitro-2-methylphenol	ND	581	255	Q	µg/Kg-dry	1	12/19/22 20:45:11
4-Bromophenyl phenyl ether	ND	69.7	27.4		µg/Kg-dry	1	12/19/22 20:45:11
Hexachlorobenzene	ND	69.7	13.6		µg/Kg-dry	1	12/19/22 20:45:11
Pentachlorophenol	ND	465	167		µg/Kg-dry	1	12/19/22 20:45:11
Phenanthrene	69.8	69.7	18.4		µg/Kg-dry	1	12/19/22 20:45:11
Anthracene	39.6	69.7	12.9	J	µg/Kg-dry	1	12/19/22 20:45:11
Carbazole	ND	69.7	15.0		µg/Kg-dry	1	12/19/22 20:45:11
Di-n-butylphthalate	ND	69.7	25.1		µg/Kg-dry	1	12/19/22 20:45:11
Fluoranthene	56.7	69.7	20.5	J	µg/Kg-dry	1	12/19/22 20:45:11
Pyrene	ND	349	111		µg/Kg-dry	1	12/19/22 20:45:11
Butyl Benzylphthalate	ND	116	34.2		µg/Kg-dry	1	12/19/22 20:45:11
bis(2-Ethylhexyl)adipate	ND	465	171		µg/Kg-dry	1	12/16/22 10:58:59
Benz(a)anthracene	45.5	69.7	18.8	J	µg/Kg-dry	1	12/19/22 20:45:11
Chrysene	95.5	116	26.7	J	µg/Kg-dry	1	12/19/22 20:45:11
bis (2-Ethylhexyl) phthalate	ND	93.0	26.2		µg/Kg-dry	1	12/16/22 10:58:59
Di-n-octyl phthalate	ND	174	43.4		µg/Kg-dry	1	12/16/22 10:58:59
Benzo(b)fluoranthene	41.6	232	24.6	J	µg/Kg-dry	1	12/19/22 20:45:11
Benzo(k)fluoranthene	ND	69.7	23.3		µg/Kg-dry	1	12/19/22 20:45:11
Benzo(a)pyrene	ND	93.0	33.8		µg/Kg-dry	1	12/19/22 20:45:11
Indeno(1,2,3-cd)pyrene	ND	465	161		µg/Kg-dry	1	12/19/22 20:45:11
Dibenz(a,h)anthracene	ND	232	90.4		µg/Kg-dry	1	12/19/22 20:45:11
Benzo(g,h,i)perylene	ND	232	67.2		µg/Kg-dry	1	12/19/22 20:45:11

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 10:25:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-004

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD72-1005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771

Analyst: SK

Surr: 2,4,6-Tribromophenol	80.1	16.2 - 150	0		%Rec	1	12/19/22 20:45:11
Surr: 2-Fluorobiphenyl	75.3	25.3 - 139	0		%Rec	1	12/19/22 20:45:11
Surr: Nitrobenzene-d5	65.4	12.7 - 143	0		%Rec	1	12/19/22 20:45:11
Surr: Phenol-d6	65.4	21.4 - 139	0		%Rec	1	12/19/22 20:45:11
Surr: p-Terphenyl	76.0	37.1 - 144	0		%Rec	1	12/19/22 20:45:11

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38735

Analyst: EH

Arsenic	9.37	0.526	0.154		mg/Kg-dry	1	12/07/22 12:40:37
Cadmium	1.20	0.351	0.0134		mg/Kg-dry	1	12/07/22 12:40:37
Chromium	32.5	0.965	0.229		mg/Kg-dry	1	12/07/22 12:40:37
Copper	51.4	1.93	0.328		mg/Kg-dry	1	12/07/22 12:40:37
Lead	12.8	0.526	0.0730		mg/Kg-dry	1	12/07/22 12:40:37
Silver	0.239	0.175	0.0361		mg/Kg-dry	1	12/07/22 12:40:37
Zinc	85.6	3.07	1.07		mg/Kg-dry	1	12/07/22 12:40:37

**Sample Moisture (Percent Moisture)**

Batch ID: R80307

Analyst: CO

Percent Moisture	57.4	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858

Analyst: AT

Total Organic Carbon	1.96	0.150	0.0412		%-dry	1	12/20/22 12:23:00
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# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 9:35:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-005

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD73-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
Phenol	ND	51.3	13.5		µg/Kg-dry	1	12/19/22 21:14:57
Bis(2-chloroethyl) ether	ND	85.6	26.2		µg/Kg-dry	1	12/19/22 21:14:57
2-Chlorophenol	ND	68.4	24.7		µg/Kg-dry	1	12/19/22 21:14:57
1,3-Dichlorobenzene	ND	68.4	28.0		µg/Kg-dry	1	12/19/22 21:14:57
1,4-Dichlorobenzene	ND	51.3	22.1		µg/Kg-dry	1	12/19/22 21:14:57
1,2-Dichlorobenzene	ND	68.4	22.7		µg/Kg-dry	1	12/19/22 21:14:57
Benzyl alcohol	ND	257	98.5	Q	µg/Kg-dry	1	12/19/22 21:14:57
2-Methylphenol (o-cresol)	ND	68.4	26.7		µg/Kg-dry	1	12/19/22 21:14:57
Hexachloroethane	ND	68.4	21.5		µg/Kg-dry	1	12/19/22 21:14:57
N-Nitrosodi-n-propylamine	ND	137	47.0		µg/Kg-dry	1	12/19/22 21:14:57
3&4-Methylphenol (m, p-cresol)	32.3	51.3	22.1	J	µg/Kg-dry	1	12/19/22 21:14:57
Nitrobenzene	ND	85.6	26.2		µg/Kg-dry	1	12/19/22 21:14:57
Isophorone	ND	68.4	22.3		µg/Kg-dry	1	12/19/22 21:14:57
2-Nitrophenol	ND	51.3	21.9		µg/Kg-dry	1	12/19/22 21:14:57
2,4-Dimethylphenol	ND	51.3	10.0		µg/Kg-dry	1	12/19/22 21:14:57
Bis(2-chloroethoxy)methane	ND	51.3	9.69		µg/Kg-dry	1	12/19/22 21:14:57
2,4-Dichlorophenol	ND	51.3	7.54		µg/Kg-dry	1	12/19/22 21:14:57
1,2,4-Trichlorobenzene	ND	51.3	19.2		µg/Kg-dry	1	12/19/22 21:14:57
Naphthalene	ND	68.4	20.9		µg/Kg-dry	1	12/19/22 21:14:57
4-Chloroaniline	ND	51.3	15.2		µg/Kg-dry	1	12/19/22 21:14:57
Hexachlorobutadiene	ND	51.3	14.9		µg/Kg-dry	1	12/19/22 21:14:57
4-Chloro-3-methylphenol	ND	51.3	19.5		µg/Kg-dry	1	12/19/22 21:14:57
2-Methylnaphthalene	ND	51.3	12.6		µg/Kg-dry	1	12/19/22 21:14:57
1-Methylnaphthalene	ND	51.3	8.78		µg/Kg-dry	1	12/19/22 21:14:57
Hexachlorocyclopentadiene	ND	171	37.9		µg/Kg-dry	1	12/16/22 11:29:24
2,4,6-Trichlorophenol	ND	51.3	21.7		µg/Kg-dry	1	12/19/22 21:14:57
2,4,5-Trichlorophenol	ND	51.3	15.1		µg/Kg-dry	1	12/19/22 21:14:57
2-Chloronaphthalene	ND	51.3	10.9		µg/Kg-dry	1	12/19/22 21:14:57
2-Nitroaniline	ND	85.6	34.0		µg/Kg-dry	1	12/19/22 21:14:57
Acenaphthene	ND	51.3	12.0		µg/Kg-dry	1	12/19/22 21:14:57
Dimethylphthalate	ND	5,990	2,760		µg/Kg-dry	1	12/19/22 21:14:57

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 9:35:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-005

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD73-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38771		Analyst: SK		
2,6-Dinitrotoluene	ND	68.4	24.7		µg/Kg-dry	1	12/19/22 21:14:57
Acenaphthylene	ND	51.3	10.7		µg/Kg-dry	1	12/19/22 21:14:57
2,4-Dinitrophenol	ND	513	221	Q	µg/Kg-dry	1	12/19/22 21:14:57
Dibenzofuran	ND	51.3	10.2		µg/Kg-dry	1	12/19/22 21:14:57
2,4-Dinitrotoluene	ND	103	41.5		µg/Kg-dry	1	12/19/22 21:14:57
4-Nitrophenol	ND	342	92.3		µg/Kg-dry	1	12/19/22 21:14:57
Fluorene	ND	51.3	8.56		µg/Kg-dry	1	12/19/22 21:14:57
4-Chlorophenyl phenyl ether	ND	51.3	13.9		µg/Kg-dry	1	12/19/22 21:14:57
Diethylphthalate	ND	1,280	411		µg/Kg-dry	1	12/19/22 21:14:57
4,6-Dinitro-2-methylphenol	ND	428	188	Q	µg/Kg-dry	1	12/19/22 21:14:57
4-Bromophenyl phenyl ether	ND	51.3	20.2		µg/Kg-dry	1	12/19/22 21:14:57
Hexachlorobenzene	ND	51.3	10.0		µg/Kg-dry	1	12/19/22 21:14:57
Pentachlorophenol	ND	342	123		µg/Kg-dry	1	12/19/22 21:14:57
Phenanthrene	31.8	51.3	13.5	J	µg/Kg-dry	1	12/19/22 21:14:57
Anthracene	11.4	51.3	9.48	J	µg/Kg-dry	1	12/19/22 21:14:57
Carbazole	ND	51.3	11.1		µg/Kg-dry	1	12/19/22 21:14:57
Di-n-butylphthalate	ND	51.3	18.5		µg/Kg-dry	1	12/19/22 21:14:57
Fluoranthene	55.0	51.3	15.1		µg/Kg-dry	1	12/19/22 21:14:57
Pyrene	ND	257	81.9		µg/Kg-dry	1	12/19/22 21:14:57
Butyl Benzylphthalate	ND	85.6	25.2		µg/Kg-dry	1	12/19/22 21:14:57
bis(2-Ethylhexyl)adipate	ND	342	126		µg/Kg-dry	1	12/16/22 11:29:24
Benz(a)anthracene	ND	51.3	13.9		µg/Kg-dry	1	12/19/22 21:14:57
Chrysene	ND	85.6	19.7		µg/Kg-dry	1	12/19/22 21:14:57
bis (2-Ethylhexyl) phthalate	40.9	68.4	19.3	J	µg/Kg-dry	1	12/16/22 11:29:24
Di-n-octyl phthalate	ND	128	31.9		µg/Kg-dry	1	12/16/22 11:29:24
Benzo(b)fluoranthene	ND	171	18.1		µg/Kg-dry	1	12/19/22 21:14:57
Benzo(k)fluoranthene	ND	51.3	17.1		µg/Kg-dry	1	12/19/22 21:14:57
Benzo(a)pyrene	ND	68.4	24.9		µg/Kg-dry	1	12/19/22 21:14:57
Indeno(1,2,3-cd)pyrene	ND	342	118		µg/Kg-dry	1	12/19/22 21:14:57
Dibenz(a,h)anthracene	ND	171	66.6		µg/Kg-dry	1	12/19/22 21:14:57
Benzo(g,h,i)perylene	ND	171	49.5		µg/Kg-dry	1	12/19/22 21:14:57

Original





# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental  
**Project:** Solid Wood Inc.  
**Lab ID:** 2212039-005  
**Client Sample ID:** WB-SO-SD73-0005

**Collection Date:** 11/30/2022 9:35:00 AM  
**Matrix:** Soil

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38771 Analyst: SK

Surr: 2,4,6-Tribromophenol	69.6	16.2 - 150	0		%Rec	1	12/19/22 21:14:57
Surr: 2-Fluorobiphenyl	67.6	25.3 - 139	0		%Rec	1	12/19/22 21:14:57
Surr: Nitrobenzene-d5	59.0	12.7 - 143	0		%Rec	1	12/19/22 21:14:57
Surr: Phenol-d6	59.6	21.4 - 139	0		%Rec	1	12/19/22 21:14:57
Surr: p-Terphenyl	69.5	37.1 - 144	0		%Rec	1	12/19/22 21:14:57

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38735 Analyst: EH

Arsenic	7.76	0.468	0.137		mg/Kg-dry	1	12/07/22 13:13:20
Cadmium	0.409	0.312	0.0119		mg/Kg-dry	1	12/07/22 13:13:20
Chromium	31.2	0.858	0.204		mg/Kg-dry	1	12/07/22 13:13:20
Copper	37.4	1.72	0.292		mg/Kg-dry	1	12/07/22 13:13:20
Lead	8.63	0.468	0.0649		mg/Kg-dry	1	12/07/22 13:13:20
Silver	0.153	0.156	0.0321	J	mg/Kg-dry	1	12/07/22 13:13:20
Zinc	66.7	2.73	0.951		mg/Kg-dry	1	12/07/22 13:13:20

**Sample Moisture (Percent Moisture)**

Batch ID: R80307 Analyst: CO

Percent Moisture	49.9	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858 Analyst: AT

Total Organic Carbon	3.90	0.150	0.0412		%-dry	1	12/20/22 12:39:00
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# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 11:15:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-006

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD74-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38841		Analyst: SG		
Phenol	ND	65.3	17.2		µg/Kg-dry	1	12/15/22 15:03:32
Bis(2-chloroethyl) ether	ND	109	33.3		µg/Kg-dry	1	12/15/22 15:03:32
2-Chlorophenol	ND	87.1	31.4		µg/Kg-dry	1	12/15/22 15:03:32
1,3-Dichlorobenzene	ND	87.1	35.7		µg/Kg-dry	1	12/15/22 15:03:32
1,4-Dichlorobenzene	ND	65.3	28.1		µg/Kg-dry	1	12/15/22 15:03:32
1,2-Dichlorobenzene	ND	87.1	28.8		µg/Kg-dry	1	12/15/22 15:03:32
Benzyl alcohol	ND	327	125	Q	µg/Kg-dry	1	12/15/22 15:03:32
2-Methylphenol (o-cresol)	ND	87.1	34.0		µg/Kg-dry	1	12/15/22 15:03:32
Hexachloroethane	ND	87.1	27.4		µg/Kg-dry	1	12/15/22 15:03:32
N-Nitrosodi-n-propylamine	ND	174	59.8		µg/Kg-dry	1	12/15/22 15:03:32
3&4-Methylphenol (m, p-cresol)	ND	65.3	28.1		µg/Kg-dry	1	12/15/22 15:03:32
Nitrobenzene	ND	109	33.3		µg/Kg-dry	1	12/15/22 15:03:32
Isophorone	ND	87.1	28.4		µg/Kg-dry	1	12/15/22 15:03:32
2-Nitrophenol	ND	65.3	27.9		µg/Kg-dry	1	12/15/22 15:03:32
2,4-Dimethylphenol	ND	65.3	12.7		µg/Kg-dry	1	12/15/22 15:03:32
Bis(2-chloroethoxy)methane	ND	65.3	12.3		µg/Kg-dry	1	12/15/22 15:03:32
2,4-Dichlorophenol	ND	65.3	9.60		µg/Kg-dry	1	12/15/22 15:03:32
1,2,4-Trichlorobenzene	ND	65.3	24.4		µg/Kg-dry	1	12/15/22 15:03:32
Naphthalene	ND	87.1	26.6		µg/Kg-dry	1	12/15/22 15:03:32
4-Chloroaniline	ND	65.3	19.4		µg/Kg-dry	1	12/15/22 15:03:32
Hexachlorobutadiene	ND	65.3	19.0		µg/Kg-dry	1	12/15/22 15:03:32
4-Chloro-3-methylphenol	ND	65.3	24.8		µg/Kg-dry	1	12/15/22 15:03:32
2-Methylnaphthalene	ND	65.3	16.0		µg/Kg-dry	1	12/15/22 15:03:32
1-Methylnaphthalene	ND	65.3	11.2		µg/Kg-dry	1	12/15/22 15:03:32
Hexachlorocyclopentadiene	ND	218	48.3		µg/Kg-dry	1	12/15/22 15:03:32
2,4,6-Trichlorophenol	ND	65.3	27.6		µg/Kg-dry	1	12/15/22 15:03:32
2,4,5-Trichlorophenol	ND	65.3	19.3		µg/Kg-dry	1	12/15/22 15:03:32
2-Chloronaphthalene	ND	65.3	13.8		µg/Kg-dry	1	12/15/22 15:03:32
2-Nitroaniline	ND	109	43.2		µg/Kg-dry	1	12/15/22 15:03:32
Acenaphthene	ND	65.3	15.2		µg/Kg-dry	1	12/15/22 15:03:32
Dimethylphthalate	ND	7,620	3,520		µg/Kg-dry	1	12/15/22 15:03:32

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 11:15:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-006

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD74-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38841		Analyst: SG		
2,6-Dinitrotoluene	ND	87.1	31.5		µg/Kg-dry	1	12/15/22 15:03:32
Acenaphthylene	ND	65.3	13.6		µg/Kg-dry	1	12/15/22 15:03:32
2,4-Dinitrophenol	ND	653	281		µg/Kg-dry	1	12/15/22 15:03:32
Dibenzofuran	ND	65.3	13.0		µg/Kg-dry	1	12/15/22 15:03:32
2,4-Dinitrotoluene	ND	131	52.8		µg/Kg-dry	1	12/15/22 15:03:32
4-Nitrophenol	ND	436	117	Q	µg/Kg-dry	1	12/15/22 15:03:32
Fluorene	ND	65.3	10.9		µg/Kg-dry	1	12/15/22 15:03:32
4-Chlorophenyl phenyl ether	ND	65.3	17.7		µg/Kg-dry	1	12/15/22 15:03:32
Diethylphthalate	ND	1,630	524		µg/Kg-dry	1	12/15/22 15:03:32
4,6-Dinitro-2-methylphenol	ND	544	239		µg/Kg-dry	1	12/15/22 15:03:32
4-Bromophenyl phenyl ether	ND	65.3	25.6		µg/Kg-dry	1	12/15/22 15:03:32
Hexachlorobenzene	ND	65.3	12.7		µg/Kg-dry	1	12/15/22 15:03:32
Pentachlorophenol	ND	436	156		µg/Kg-dry	1	12/15/22 15:03:32
Phenanthrene	ND	65.3	17.2		µg/Kg-dry	1	12/15/22 15:03:32
Anthracene	ND	65.3	12.1		µg/Kg-dry	1	12/15/22 15:03:32
Carbazole	ND	65.3	14.1		µg/Kg-dry	1	12/15/22 15:03:32
Di-n-butylphthalate	ND	65.3	23.5		µg/Kg-dry	1	12/15/22 15:03:32
Fluoranthene	22.2	65.3	19.2	J	µg/Kg-dry	1	12/15/22 15:03:32
Pyrene	ND	327	104		µg/Kg-dry	1	12/15/22 15:03:32
Butyl Benzylphthalate	ND	109	32.1		µg/Kg-dry	1	12/15/22 15:03:32
bis(2-Ethylhexyl)adipate	ND	436	160		µg/Kg-dry	1	12/15/22 15:03:32
Benz(a)anthracene	ND	65.3	17.6		µg/Kg-dry	1	12/15/22 15:03:32
Chrysene	ND	109	25.0		µg/Kg-dry	1	12/15/22 15:03:32
bis (2-Ethylhexyl) phthalate	43.1	87.1	24.5	J	µg/Kg-dry	1	12/15/22 15:03:32
Di-n-octyl phthalate	ND	163	40.7		µg/Kg-dry	1	12/15/22 15:03:32
Benzo(b)fluoranthene	53.9	218	23.0	J	µg/Kg-dry	1	12/15/22 15:03:32
Benzo(k)fluoranthene	ND	65.3	21.8		µg/Kg-dry	1	12/15/22 15:03:32
Benzo(a)pyrene	ND	87.1	31.7		µg/Kg-dry	1	12/15/22 15:03:32
Indeno(1,2,3-cd)pyrene	ND	436	151		µg/Kg-dry	1	12/15/22 15:03:32
Dibenz(a,h)anthracene	92.5	218	84.7	J	µg/Kg-dry	1	12/15/22 15:03:32
Benzo(g,h,i)perylene	76.2	218	63.0	J	µg/Kg-dry	1	12/15/22 15:03:32

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 11:15:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-006

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD74-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38841

Analyst: SG

Surr: 2,4,6-Tribromophenol	74.7	16.2 - 150	0		%Rec	1	12/15/22 15:03:32
Surr: 2-Fluorobiphenyl	79.8	25.3 - 139	0		%Rec	1	12/15/22 15:03:32
Surr: Nitrobenzene-d5	71.7	12.7 - 143	0		%Rec	1	12/15/22 15:03:32
Surr: Phenol-d6	71.0	21.4 - 139	0		%Rec	1	12/15/22 15:03:32
Surr: p-Terphenyl	78.7	37.1 - 144	0		%Rec	1	12/15/22 15:03:32

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38735

Analyst: EH

Arsenic	8.94	0.614	0.179		mg/Kg-dry	1	12/07/22 13:16:04
Cadmium	0.929	0.409	0.0156		mg/Kg-dry	1	12/07/22 13:16:04
Chromium	37.9	1.13	0.268		mg/Kg-dry	1	12/07/22 13:16:04
Copper	57.3	2.25	0.383		mg/Kg-dry	1	12/07/22 13:16:04
Lead	12.1	0.614	0.0852		mg/Kg-dry	1	12/07/22 13:16:04
Silver	0.223	0.205	0.0422		mg/Kg-dry	1	12/07/22 13:16:04
Zinc	89.0	3.58	1.25		mg/Kg-dry	1	12/07/22 13:16:04

**Sample Moisture (Percent Moisture)**

Batch ID: R80307

Analyst: CO

Percent Moisture	61.5	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858

Analyst: AT

Total Organic Carbon	2.15	0.150	0.0412		%-dry	1	12/20/22 14:22:00
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# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 11:45:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-007

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD75-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
<b>Semivolatile Organic Compounds by EPA Method 8270</b>			Batch ID: 38841		Analyst: SG		
Phenol	ND	57.3	15.1		µg/Kg-dry	1	12/15/22 15:33:53
Bis(2-chloroethyl) ether	ND	95.5	29.2		µg/Kg-dry	1	12/15/22 15:33:53
2-Chlorophenol	ND	76.4	27.6		µg/Kg-dry	1	12/15/22 15:33:53
1,3-Dichlorobenzene	ND	76.4	31.3		µg/Kg-dry	1	12/15/22 15:33:53
1,4-Dichlorobenzene	ND	57.3	24.7		µg/Kg-dry	1	12/15/22 15:33:53
1,2-Dichlorobenzene	ND	76.4	25.3		µg/Kg-dry	1	12/15/22 15:33:53
Benzyl alcohol	ND	286	110	Q	µg/Kg-dry	1	12/15/22 15:33:53
2-Methylphenol (o-cresol)	ND	76.4	29.8		µg/Kg-dry	1	12/15/22 15:33:53
Hexachloroethane	ND	76.4	24.0		µg/Kg-dry	1	12/15/22 15:33:53
N-Nitrosodi-n-propylamine	ND	153	52.5		µg/Kg-dry	1	12/15/22 15:33:53
3&4-Methylphenol (m, p-cresol)	ND	57.3	24.7		µg/Kg-dry	1	12/15/22 15:33:53
Nitrobenzene	ND	95.5	29.2		µg/Kg-dry	1	12/15/22 15:33:53
Isophorone	ND	76.4	24.9		µg/Kg-dry	1	12/15/22 15:33:53
2-Nitrophenol	ND	57.3	24.5		µg/Kg-dry	1	12/15/22 15:33:53
2,4-Dimethylphenol	ND	57.3	11.2		µg/Kg-dry	1	12/15/22 15:33:53
Bis(2-chloroethoxy)methane	ND	57.3	10.8		µg/Kg-dry	1	12/15/22 15:33:53
2,4-Dichlorophenol	ND	57.3	8.42		µg/Kg-dry	1	12/15/22 15:33:53
1,2,4-Trichlorobenzene	ND	57.3	21.4		µg/Kg-dry	1	12/15/22 15:33:53
Naphthalene	ND	76.4	23.3		µg/Kg-dry	1	12/15/22 15:33:53
4-Chloroaniline	ND	57.3	17.0		µg/Kg-dry	1	12/15/22 15:33:53
Hexachlorobutadiene	ND	57.3	16.6		µg/Kg-dry	1	12/15/22 15:33:53
4-Chloro-3-methylphenol	ND	57.3	21.8		µg/Kg-dry	1	12/15/22 15:33:53
2-Methylnaphthalene	ND	57.3	14.0		µg/Kg-dry	1	12/15/22 15:33:53
1-Methylnaphthalene	ND	57.3	9.80		µg/Kg-dry	1	12/15/22 15:33:53
Hexachlorocyclopentadiene	ND	191	42.3		µg/Kg-dry	1	12/15/22 15:33:53
2,4,6-Trichlorophenol	ND	57.3	24.2		µg/Kg-dry	1	12/15/22 15:33:53
2,4,5-Trichlorophenol	ND	57.3	16.9		µg/Kg-dry	1	12/15/22 15:33:53
2-Chloronaphthalene	ND	57.3	12.1		µg/Kg-dry	1	12/15/22 15:33:53
2-Nitroaniline	ND	95.5	37.9		µg/Kg-dry	1	12/15/22 15:33:53
Acenaphthene	ND	57.3	13.3		µg/Kg-dry	1	12/15/22 15:33:53
Dimethylphthalate	ND	6,680	3,080		µg/Kg-dry	1	12/15/22 15:33:53

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 11:45:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-007

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD75-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38841

Analyst: SG

2,6-Dinitrotoluene	ND	76.4	27.6		µg/Kg-dry	1	12/15/22 15:33:53
Acenaphthylene	ND	57.3	12.0		µg/Kg-dry	1	12/15/22 15:33:53
2,4-Dinitrophenol	ND	573	246		µg/Kg-dry	1	12/15/22 15:33:53
Dibenzofuran	ND	57.3	11.4		µg/Kg-dry	1	12/15/22 15:33:53
2,4-Dinitrotoluene	ND	115	46.3		µg/Kg-dry	1	12/15/22 15:33:53
4-Nitrophenol	ND	382	103	Q	µg/Kg-dry	1	12/15/22 15:33:53
Fluorene	ND	57.3	9.55		µg/Kg-dry	1	12/15/22 15:33:53
4-Chlorophenyl phenyl ether	ND	57.3	15.5		µg/Kg-dry	1	12/15/22 15:33:53
Diethylphthalate	ND	1,430	459		µg/Kg-dry	1	12/15/22 15:33:53
4,6-Dinitro-2-methylphenol	ND	477	210		µg/Kg-dry	1	12/15/22 15:33:53
4-Bromophenyl phenyl ether	ND	57.3	22.5		µg/Kg-dry	1	12/15/22 15:33:53
Hexachlorobenzene	ND	57.3	11.2		µg/Kg-dry	1	12/15/22 15:33:53
Pentachlorophenol	ND	382	137		µg/Kg-dry	1	12/15/22 15:33:53
Phenanthrene	16.2	57.3	15.1	J	µg/Kg-dry	1	12/15/22 15:33:53
Anthracene	ND	57.3	10.6		µg/Kg-dry	1	12/15/22 15:33:53
Carbazole	ND	57.3	12.3		µg/Kg-dry	1	12/15/22 15:33:53
Di-n-butylphthalate	ND	57.3	20.6		µg/Kg-dry	1	12/15/22 15:33:53
Fluoranthene	40.3	57.3	16.9	J	µg/Kg-dry	1	12/15/22 15:33:53
Pyrene	ND	286	91.4		µg/Kg-dry	1	12/15/22 15:33:53
Butyl Benzylphthalate	ND	95.5	28.1		µg/Kg-dry	1	12/15/22 15:33:53
bis(2-Ethylhexyl)adipate	ND	382	141		µg/Kg-dry	1	12/15/22 15:33:53
Benz(a)anthracene	33.2	57.3	15.5	J	µg/Kg-dry	1	12/15/22 15:33:53
Chrysene	25.5	95.5	22.0	J	µg/Kg-dry	1	12/15/22 15:33:53
bis (2-Ethylhexyl) phthalate	ND	76.4	21.5		µg/Kg-dry	1	12/15/22 15:33:53
Di-n-octyl phthalate	ND	143	35.7		µg/Kg-dry	1	12/15/22 15:33:53
Benzo(b)fluoranthene	ND	191	20.2		µg/Kg-dry	1	12/15/22 15:33:53
Benzo(k)fluoranthene	41.2	57.3	19.1	J	µg/Kg-dry	1	12/15/22 15:33:53
Benzo(a)pyrene	34.8	76.4	27.8	J	µg/Kg-dry	1	12/15/22 15:33:53
Indeno(1,2,3-cd)pyrene	ND	382	132		µg/Kg-dry	1	12/15/22 15:33:53
Dibenz(a,h)anthracene	ND	191	74.3		µg/Kg-dry	1	12/15/22 15:33:53
Benzo(g,h,i)perylene	140	191	55.2	J	µg/Kg-dry	1	12/15/22 15:33:53

Original



# Analytical Report

Work Order: 2212039  
Date Reported: 2/1/2023

**Client:** Libby Environmental

**Collection Date:** 11/30/2022 11:45:00 AM

**Project:** Solid Wood Inc.

**Lab ID:** 2212039-007

**Matrix:** Soil

**Client Sample ID:** WB-SO-SD75-0005

Analyses	Result	RL	MDL	Qual	Units	DF	Date Analyzed
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**Semivolatile Organic Compounds by EPA Method 8270**

Batch ID: 38841

Analyst: SG

Surr: 2,4,6-Tribromophenol	61.8	16.2 - 150	0		%Rec	1	12/15/22 15:33:53
Surr: 2-Fluorobiphenyl	62.0	25.3 - 139	0		%Rec	1	12/15/22 15:33:53
Surr: Nitrobenzene-d5	53.6	12.7 - 143	0		%Rec	1	12/15/22 15:33:53
Surr: Phenol-d6	60.7	21.4 - 139	0		%Rec	1	12/15/22 15:33:53
Surr: p-Terphenyl	59.4	37.1 - 144	0		%Rec	1	12/15/22 15:33:53

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

**Total Metals by EPA Method 6020B**

Batch ID: 38735

Analyst: EH

Arsenic	6.03	0.618	0.180		mg/Kg-dry	1	12/07/22 13:18:47
Cadmium	0.240	0.412	0.0157	J	mg/Kg-dry	1	12/07/22 13:18:47
Chromium	37.4	1.13	0.269		mg/Kg-dry	1	12/07/22 13:18:47
Copper	52.8	2.27	0.385		mg/Kg-dry	1	12/07/22 13:18:47
Lead	9.47	0.618	0.0857		mg/Kg-dry	1	12/07/22 13:18:47
Silver	0.116	0.206	0.0424	J	mg/Kg-dry	1	12/07/22 13:18:47
Zinc	78.5	3.60	1.26		mg/Kg-dry	1	12/07/22 13:18:47

**Sample Moisture (Percent Moisture)**

Batch ID: R80307

Analyst: CO

Percent Moisture	62.1	0.500	0.100		wt%	1	12/07/22 9:46:39
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**Total Organic Carbon by EPA 9060**

Batch ID: 38858

Analyst: AT

Total Organic Carbon	1.94	0.150	0.0412		%-dry	1	12/20/22 14:38:00
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**Work Order:** 2212039  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Organic Carbon by EPA 9060**

Sample ID: <b>MB-38858</b>	SampType: <b>MBLK</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80705</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38858</b>	Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1669395</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	ND	0.150									

Sample ID: <b>LCS-38858</b>	SampType: <b>LCS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80705</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38858</b>	Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1669396</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	0.948	0.150	0.8580	0	110	80	120				

Sample ID: <b>2212039-005ADUP</b>	SampType: <b>DUP</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80705</b>							
Client ID: <b>WB-SO-SD73-0005</b>	Batch ID: <b>38858</b>	Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1669402</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	2.86	0.150						3.898	30.6	20	R

**NOTES:**

R - High RPD due to sample inhomogeneity.

Sample ID: <b>2212039-005AMS</b>	SampType: <b>MS</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80705</b>							
Client ID: <b>WB-SO-SD73-0005</b>	Batch ID: <b>38858</b>	Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1669403</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	3.59	0.150	1.000	3.898	-31.0	75	125				S

**NOTES:**

S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Sample ID: <b>2212039-005AMSD</b>	SampType: <b>MSD</b>	Units: <b>%-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80705</b>							
Client ID: <b>WB-SO-SD73-0005</b>	Batch ID: <b>38858</b>	Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1669404</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Total Organic Carbon	4.35	0.150	1.000	3.898	45.6	75	125	3.588	19.3	20	S

**NOTES:**

S - Spiked amount was low relative to sample concentration. Outlying spike recoveries may be expected.

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>MB-38718</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80303</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38718</b>	Analysis Date: <b>12/6/2022</b>	SeqNo: <b>1658991</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.250									
Cadmium	ND	0.0200									
Chromium	ND	0.250									
Copper	ND	0.750									
Lead	ND	1.00									
Silver	ND	0.0200									
Zinc	ND	3.50									

Sample ID: <b>LCS-38718</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80303</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38718</b>	Analysis Date: <b>12/6/2022</b>	SeqNo: <b>1658992</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	49.9	0.250	50.00	0	99.9	80	120				
Cadmium	2.44	0.0200	2.500	0	97.7	80	120				
Chromium	51.1	0.250	50.00	0	102	80	120				
Copper	53.8	0.750	50.00	0	108	80	120				
Lead	25.3	1.00	25.00	0	101	80	120				
Silver	2.50	0.0200	2.500	0	100	80	120				
Zinc	50.9	3.50	50.00	0	102	80	120				

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80303</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38718</b>	Analysis Date: <b>12/6/2022</b>	SeqNo: <b>1659002</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.6	0.272	54.41	1.309	92.5	75	125				
Cadmium	2.63	0.0218	2.720	0.03261	95.5	75	125				
Chromium	58.5	0.272	54.41	11.80	85.8	75	125				
Copper	63.7	0.816	54.41	15.92	87.9	75	125				
Lead	28.3	1.09	27.20	1.704	97.8	75	125				
Silver	2.62	0.0218	2.720	0.02929	95.2	75	125				
Zinc	70.1	3.81	54.41	20.15	91.7	75	125				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80303</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38718</b>	Analysis Date: <b>12/6/2022</b>	SeqNo: <b>1659002</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Sample ID: <b>2211617-012AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>	Prep Date: <b>12/5/2022</b>	RunNo: <b>80303</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38718</b>	Analysis Date: <b>12/6/2022</b>	SeqNo: <b>1659003</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	51.8	0.268	53.57	1.309	94.2	75	125	51.62	0.331	20	
Cadmium	2.59	0.0214	2.678	0.03261	95.6	75	125	2.630	1.45	20	
Chromium	59.4	0.268	53.57	11.80	88.9	75	125	58.48	1.61	20	
Copper	65.6	0.804	53.57	15.92	92.7	75	125	63.73	2.87	20	
Lead	28.3	1.07	26.78	1.704	99.4	75	125	28.31	0.0246	20	
Silver	2.61	0.0214	2.678	0.02929	96.2	75	125	2.620	0.517	20	
Zinc	70.1	3.75	53.57	20.15	93.3	75	125	70.06	0.0900	20	

Sample ID: <b>MB-38735</b>	SampType: <b>MBLK</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/6/2022</b>	RunNo: <b>80320</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38735</b>	Analysis Date: <b>12/7/2022</b>	SeqNo: <b>1659450</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	ND	0.300									
Cadmium	ND	0.200									
Chromium	ND	0.550									
Copper	ND	1.10									
Lead	ND	0.300									
Silver	ND	0.100									
Zinc	ND	1.75									

Sample ID: <b>LCS-38735</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>	Prep Date: <b>12/6/2022</b>	RunNo: <b>80320</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38735</b>	Analysis Date: <b>12/7/2022</b>	SeqNo: <b>1659451</b>								
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	47.4	0.300	50.00	0	94.9	80	120				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Total Metals by EPA Method 6020B**

Sample ID: <b>LCS-38735</b>	SampType: <b>LCS</b>	Units: <b>mg/Kg</b>				Prep Date: <b>12/6/2022</b>	RunNo: <b>80320</b>				
Client ID: <b>LCSS</b>	Batch ID: <b>38735</b>					Analysis Date: <b>12/7/2022</b>	SeqNo: <b>1659451</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Cadmium	2.45	0.200	2.500	0	98.1	80	120				
Chromium	47.9	0.550	50.00	0	95.7	80	120				
Copper	51.5	1.10	50.00	0	103	80	120				
Lead	27.3	0.300	25.00	0	109	80	120				
Silver	2.63	0.100	2.500	0	105	80	120				
Zinc	48.7	1.75	50.00	0	97.4	80	120				

Sample ID: <b>2212039-004AMS</b>	SampType: <b>MS</b>	Units: <b>mg/Kg-dry</b>				Prep Date: <b>12/6/2022</b>	RunNo: <b>80320</b>				
Client ID: <b>WB-SO-SD72-1005</b>	Batch ID: <b>38735</b>					Analysis Date: <b>12/7/2022</b>	SeqNo: <b>1659454</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	99.7	0.547	91.09	9.373	99.1	75	125				
Cadmium	6.01	0.364	4.554	1.204	105	75	125				
Chromium	125	1.00	91.09	32.50	101	75	125				
Copper	137	2.00	91.09	51.36	93.8	75	125				
Lead	58.2	0.547	45.54	12.75	99.7	75	125				
Silver	4.71	0.182	4.554	0.2390	98.2	75	125				
Zinc	175	3.19	91.09	85.55	97.9	75	125				

Sample ID: <b>2212039-004AMSD</b>	SampType: <b>MSD</b>	Units: <b>mg/Kg-dry</b>				Prep Date: <b>12/6/2022</b>	RunNo: <b>80320</b>				
Client ID: <b>WB-SO-SD72-1005</b>	Batch ID: <b>38735</b>					Analysis Date: <b>12/7/2022</b>	SeqNo: <b>1659455</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic	95.2	0.534	89.02	9.373	96.4	75	125	99.69	4.57	20	
Cadmium	5.68	0.356	4.451	1.204	101	75	125	6.009	5.57	20	
Chromium	118	0.979	89.02	32.50	96.1	75	125	124.9	5.64	20	
Copper	128	1.96	89.02	51.36	85.6	75	125	136.8	7.03	20	
Lead	54.5	0.534	44.51	12.75	93.8	75	125	58.16	6.45	20	
Silver	4.39	0.178	4.451	0.2390	93.2	75	125	4.711	7.08	20	
Zinc	163	3.12	89.02	85.55	87.0	75	125	174.7	6.94	20	

**Work Order:** 2212039  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38841</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38841</b>		Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665606</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	ND	30.0									
Bis(2-chloroethyl) ether	ND	50.0									
2-Chlorophenol	ND	40.0									
1,3-Dichlorobenzene	ND	40.0									
1,4-Dichlorobenzene	ND	30.0									
1,2-Dichlorobenzene	ND	40.0									
Benzyl alcohol	ND	150									Q
2-Methylphenol (o-cresol)	ND	40.0									
Hexachloroethane	ND	40.0									
N-Nitrosodi-n-propylamine	ND	80.0									
3&4-Methylphenol (m, p-cresol)	ND	30.0									
Nitrobenzene	ND	50.0									
Isophorone	ND	40.0									
2-Nitrophenol	ND	30.0									
2,4-Dimethylphenol	ND	30.0									
Bis(2-chloroethoxy)methane	ND	30.0									
2,4-Dichlorophenol	ND	30.0									
1,2,4-Trichlorobenzene	ND	30.0									
Naphthalene	ND	40.0									
4-Chloroaniline	ND	30.0									
Hexachlorobutadiene	ND	30.0									
4-Chloro-3-methylphenol	ND	30.0									
2-Methylnaphthalene	ND	30.0									
1-Methylnaphthalene	ND	30.0									
Hexachlorocyclopentadiene	ND	100									
2,4,6-Trichlorophenol	ND	30.0									
2,4,5-Trichlorophenol	ND	30.0									
2-Chloronaphthalene	ND	30.0									
2-Nitroaniline	ND	50.0									
Acenaphthene	ND	30.0									
Dimethylphthalate	ND	3,500									
2,6-Dinitrotoluene	ND	40.0									

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38841</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38841</b>		Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665606</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Acenaphthylene	ND	30.0									
2,4-Dinitrophenol	ND	300									
Dibenzofuran	ND	30.0									
2,4-Dinitrotoluene	ND	60.0									
4-Nitrophenol	ND	200									Q
Fluorene	ND	30.0									
4-Chlorophenyl phenyl ether	ND	30.0									
Diethylphthalate	ND	750									
4,6-Dinitro-2-methylphenol	ND	250									
4-Bromophenyl phenyl ether	ND	30.0									
Hexachlorobenzene	ND	30.0									
Pentachlorophenol	ND	200									
Phenanthrene	ND	30.0									
Anthracene	ND	30.0									
Carbazole	ND	30.0									
Di-n-butylphthalate	ND	30.0									
Fluoranthene	ND	30.0									
Pyrene	ND	150									
Butyl Benzylphthalate	ND	50.0									
bis(2-Ethylhexyl)adipate	ND	200									
Benz(a)anthracene	ND	30.0									
Chrysene	ND	50.0									
bis (2-Ethylhexyl) phthalate	ND	40.0									
Di-n-octyl phthalate	ND	75.0									
Benzo(b)fluoranthene	ND	100									
Benzo(k)fluoranthene	ND	30.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	200									
Dibenz(a,h)anthracene	ND	100									
Benzo(g,h,i)perylene	ND	100									
Surr: 2,4,6-Tribromophenol	1,900		2,000		95.0	16.2	150				
Surr: 2-Fluorobiphenyl	959		1,000		95.9	25.3	139				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38841</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38841</b>		Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665606</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Surr: Nitrobenzene-d5	855		1,000		85.5	12.7	143				
Surr: Phenol-d6	1,710		2,000		85.3	21.4	139				
Surr: p-Terphenyl	965		1,000		96.5	37.1	144				

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Sample ID: <b>LCS-38841</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38841</b>		Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665607</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,660	30.0	2,000	0	83.1	54	114				
Bis(2-chloroethyl) ether	1,810	50.0	2,000	0	90.7	60.2	120				
2-Chlorophenol	1,950	40.0	2,000	0	97.4	63.8	111				
1,3-Dichlorobenzene	1,910	40.0	2,000	0	95.7	64.5	110				
1,4-Dichlorobenzene	1,910	30.0	2,000	0	95.7	64.3	112				
1,2-Dichlorobenzene	1,930	40.0	2,000	0	96.4	64.2	112				
Benzyl alcohol	127	150	2,000	0	6.37	5	159				
2-Methylphenol (o-cresol)	1,700	40.0	2,000	0	85.1	51.8	116				
Hexachloroethane	1,900	40.0	2,000	0	94.9	62.1	114				
N-Nitrosodi-n-propylamine	1,860	80.0	2,000	0	93.1	59.1	123				
3&4-Methylphenol (m, p-cresol)	1,750	30.0	2,000	0	87.3	55.3	120				
Nitrobenzene	1,870	50.0	2,000	0	93.5	63.1	119				
Isophorone	1,870	40.0	2,000	0	93.3	63.7	120				
2-Nitrophenol	2,050	30.0	2,000	0	102	66.4	116				
2,4-Dimethylphenol	1,920	30.0	2,000	0	96.2	55.5	112				
Bis(2-chloroethoxy)methane	1,880	30.0	2,000	0	94.1	64.6	112				
2,4-Dichlorophenol	1,940	30.0	2,000	0	96.9	57.1	116				
1,2,4-Trichlorobenzene	1,980	30.0	2,000	0	99.0	64.7	110				
Naphthalene	1,930	40.0	2,000	0	96.3	64.7	110				
4-Chloroaniline	1,430	30.0	2,000	0	71.6	64.6	112				
Hexachlorobutadiene	2,020	30.0	2,000	0	101	64.7	116				
4-Chloro-3-methylphenol	1,720	30.0	2,000	0	85.9	50.9	128				



Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: LCS-38841	SampType: LCS	Units: µg/Kg				Prep Date: 12/14/2022	RunNo: 80555				
Client ID: LCSS	Batch ID: 38841					Analysis Date: 12/15/2022	SeqNo: 1665607				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Methylnaphthalene	1,900	30.0	2,000	0	94.9	63.6	119				
1-Methylnaphthalene	1,920	30.0	2,000	0	96.1	64.1	114				
Hexachlorocyclopentadiene	2,280	100	2,000	0	114	34.7	141				
2,4,6-Trichlorophenol	1,980	30.0	2,000	0	99.2	60.9	123				
2,4,5-Trichlorophenol	1,880	30.0	2,000	0	94.2	48.7	128				
2-Chloronaphthalene	1,940	30.0	2,000	0	96.8	65.4	114				
2-Nitroaniline	1,940	50.0	2,000	0	97.1	62.3	127				
Acenaphthene	1,980	30.0	2,000	0	98.9	63.3	118				
Dimethylphthalate	2,010	3,500	2,000	0	101	61.9	123				
2,6-Dinitrotoluene	2,020	40.0	2,000	0	101	64.6	123				
Acenaphthylene	2,020	30.0	2,000	0	101	61.9	112				
2,4-Dinitrophenol	3,110	300	4,000	0	77.8	5	132				
Dibenzofuran	1,940	30.0	2,000	0	96.8	60.2	116				
2,4-Dinitrotoluene	2,010	60.0	2,000	0	100	63.4	124				
4-Nitrophenol	1,510	200	2,000	0	75.6	8.76	130				
Fluorene	1,920	30.0	2,000	0	96.0	62.4	115				
4-Chlorophenyl phenyl ether	2,000	30.0	2,000	0	99.8	58.8	121				
Diethylphthalate	1,860	750	2,000	0	93.2	61.9	111				
4,6-Dinitro-2-methylphenol	2,110	250	2,000	0	105	5	134				
4-Bromophenyl phenyl ether	2,010	30.0	2,000	0	101	59.1	118				
Hexachlorobenzene	2,030	30.0	2,000	0	101	60.4	119				
Pentachlorophenol	1,590	200	2,000	0	79.6	26.5	130				
Phenanthrene	1,950	30.0	2,000	0	97.4	57.9	116				
Anthracene	1,950	30.0	2,000	0	97.6	56.1	118				
Carbazole	2,000	30.0	2,000	0	100	48.9	128				
Di-n-butylphthalate	1,910	30.0	2,000	0	95.3	58.9	123				
Fluoranthene	2,030	30.0	2,000	0	102	54.7	126				
Pyrene	2,000	150	2,000	0	100	53.5	126				
Butyl Benzylphthalate	2,030	50.0	2,000	0	101	54.4	131				
bis(2-Ethylhexyl)adipate	1,950	200	2,000	0	97.5	51	133				
Benz(a)anthracene	2,200	30.0	2,000	0	110	40.1	140				
Chrysene	1,880	50.0	2,000	0	94.1	59.7	116				

**Work Order:** 2212039  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38841</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>				Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>				
Client ID: <b>LCSS</b>	Batch ID: <b>38841</b>					Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665607</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
bis (2-Ethylhexyl) phthalate	1,850	40.0	2,000	0	92.6	51.2	137				
Di-n-octyl phthalate	1,900	75.0	2,000	0	95.2	48.1	152				
Benzo(b)fluoranthene	1,990	100	2,000	0	99.6	57.9	122				
Benzo(k)fluoranthene	2,080	30.0	2,000	0	104	49	124				
Benzo(a)pyrene	2,080	40.0	2,000	0	104	53	108				
Indeno(1,2,3-cd)pyrene	2,200	200	2,000	0	110	56	124				
Dibenz(a,h)anthracene	2,350	100	2,000	0	118	55.8	125				
Benzo(g,h,i)perylene	2,000	100	2,000	0	100	61.3	112				
Surr: 2,4,6-Tribromophenol	2,060		2,000		103	16.2	150				
Surr: 2-Fluorobiphenyl	973		1,000		97.3	25.3	139				
Surr: Nitrobenzene-d5	893		1,000		89.3	12.7	143				
Surr: Phenol-d6	1,740		2,000		87.1	21.4	139				
Surr: p-Terphenyl	1,010		1,000		101	37.1	144				

Sample ID: <b>2212040-010AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>				Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>				
Client ID: <b>BATCH</b>	Batch ID: <b>38841</b>					Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665612</b>				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,350	30.4	2,028	0	66.6	31.6	121				
Bis(2-chloroethyl) ether	1,460	50.7	2,028	0	71.9	26.1	123				
2-Chlorophenol	1,530	40.6	2,028	0	75.2	26.8	122				
1,3-Dichlorobenzene	1,490	40.6	2,028	0	73.5	13	122				
1,4-Dichlorobenzene	1,500	30.4	2,028	0	73.9	14.1	122				
1,2-Dichlorobenzene	1,490	40.6	2,028	0	73.6	18.6	122				
Benzyl alcohol	169	152	2,028	0	8.35	5	142				
2-Methylphenol (o-cresol)	1,410	40.6	2,028	0	69.4	36.5	121				
Hexachloroethane	1,490	40.6	2,028	0	73.2	9.86	123				
N-Nitrosodi-n-propylamine	1,450	81.1	2,028	0	71.4	29.5	128				
3&4-Methylphenol (m, p-cresol)	1,330	30.4	2,028	0	65.7	30.6	127				
Nitrobenzene	1,490	50.7	2,028	0	73.5	30.8	123				
Isophorone	1,490	40.6	2,028	0	73.4	30.8	128				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2212040-010AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/14/2022</b>	RunNo: <b>80555</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38841</b>		Analysis Date: <b>12/15/2022</b>	SeqNo: <b>1665612</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2-Nitrophenol	1,630	30.4	2,028	0	80.3	30.3	126				
2,4-Dimethylphenol	1,480	30.4	2,028	0	73.2	32.2	120				
Bis(2-chloroethoxy)methane	1,510	30.4	2,028	0	74.3	34.3	120				
2,4-Dichlorophenol	1,540	30.4	2,028	0	75.7	33.7	123				
1,2,4-Trichlorobenzene	1,550	30.4	2,028	0	76.3	33.7	116				
Naphthalene	1,580	40.6	2,028	0	77.9	33.3	119				
4-Chloroaniline	1,210	30.4	2,028	0	59.5	10.2	120				
Hexachlorobutadiene	1,620	30.4	2,028	0	79.8	32.2	118				
4-Chloro-3-methylphenol	1,380	30.4	2,028	0	68.1	35.4	133				
2-Methylnaphthalene	1,580	30.4	2,028	0	77.9	39.4	117				
1-Methylnaphthalene	1,590	30.4	2,028	0	78.4	37.1	121				
Hexachlorocyclopentadiene	1,530	101	2,028	0	75.7	5	134				
2,4,6-Trichlorophenol	1,610	30.4	2,028	0	79.2	37.2	129				
2,4,5-Trichlorophenol	1,620	30.4	2,028	0	79.7	37.1	124				
2-Chloronaphthalene	1,610	30.4	2,028	0	79.1	40.8	117				
2-Nitroaniline	1,600	50.7	2,028	0	79.1	40.4	131				
Acenaphthene	1,640	30.4	2,028	0	80.8	34.1	119				
Dimethylphthalate	1,700	3,550	2,028	0	83.8	37	126				
2,6-Dinitrotoluene	1,670	40.6	2,028	0	82.3	43.4	123				
Acenaphthylene	1,640	30.4	2,028	0	80.9	38.5	115				
2,4-Dinitrophenol	2,770	304	4,057	0	68.3	5	127				
Dibenzofuran	1,610	30.4	2,028	0	79.4	39	119				
2,4-Dinitrotoluene	1,700	60.9	2,028	0	83.6	40.1	127				
4-Nitrophenol	1,470	203	2,028	0	72.4	7.49	136				
Fluorene	1,600	30.4	2,028	0	79.1	34.2	124				
4-Chlorophenyl phenyl ether	1,660	30.4	2,028	0	81.7	38.8	124				
Diethylphthalate	1,570	761	2,028	0	77.2	40.1	122				
4,6-Dinitro-2-methylphenol	1,820	254	2,028	0	89.5	5	142				
4-Bromophenyl phenyl ether	1,700	30.4	2,028	0	84.0	38.5	124				
Hexachlorobenzene	1,730	30.4	2,028	0	85.2	40.4	122				
Pentachlorophenol	1,440	203	2,028	0	70.8	16.6	148				
Phenanthrene	1,620	30.4	2,028	0	79.9	29.1	128				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2212040-010AMS	SampType: MS	Units: µg/Kg-dry			Prep Date: 12/14/2022	RunNo: 80555					
Client ID: BATCH	Batch ID: 38841				Analysis Date: 12/15/2022	SeqNo: 1665612					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Anthracene	1,650	30.4	2,028	0	81.4	32.5	124				
Carbazole	1,700	30.4	2,028	0	83.6	33.5	126				
Di-n-butylphthalate	1,630	30.4	2,028	0	80.2	38.3	134				
Fluoranthene	1,720	30.4	2,028	0	84.7	30	132				
Pyrene	1,730	152	2,028	0	85.1	30.9	130				
Butyl Benzylphthalate	1,720	50.7	2,028	0	84.8	35	147				
bis(2-Ethylhexyl)adipate	1,650	203	2,028	0	81.2	34.2	149				
Benz(a)anthracene	1,870	30.4	2,028	0	92.3	25	134				
Chrysene	1,630	50.7	2,028	0	80.6	28.6	125				
bis (2-Ethylhexyl) phthalate	1,540	40.6	2,028	0	76.0	22.9	158				
Di-n-octyl phthalate	1,610	76.1	2,028	0	79.2	36.9	157				
Benzo(b)fluoranthene	1,770	101	2,028	0	87.0	21.4	140				
Benzo(k)fluoranthene	1,740	30.4	2,028	0	85.9	20.2	139				
Benzo(a)pyrene	1,750	40.6	2,028	0	86.2	17.6	149				
Indeno(1,2,3-cd)pyrene	1,660	203	2,028	0	82.0	22.7	139				
Dibenz(a,h)anthracene	1,790	101	2,028	0	88.0	23.7	145				
Benzo(g,h,i)perylene	1,420	101	2,028	0	70.0	18.6	134				
Surr: 2,4,6-Tribromophenol	1,750		2,028		86.2	16.2	150				
Surr: 2-Fluorobiphenyl	801		1,014		79.0	25.3	139				
Surr: Nitrobenzene-d5	712		1,014		70.2	12.7	143				
Surr: Phenol-d6	1,360		2,028		67.2	21.4	139				
Surr: p-Terphenyl	857		1,014		84.5	37.1	144				

Sample ID: 2212040-010AMSD	SampType: MSD	Units: µg/Kg-dry			Prep Date: 12/14/2022	RunNo: 80555					
Client ID: BATCH	Batch ID: 38841				Analysis Date: 12/15/2022	SeqNo: 1665613					
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,570	30.3	2,021	0	77.8	31.6	121	1,351	15.2	50	
Bis(2-chloroethyl) ether	1,670	50.5	2,021	0	82.5	26.1	123	1,458	13.4	50	
2-Chlorophenol	1,770	40.4	2,021	0	87.8	26.8	122	1,525	15.1	50	
1,3-Dichlorobenzene	1,730	40.4	2,021	0	85.5	13	122	1,492	14.7	50	

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: **2212040-010AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **12/14/2022** RunNo: **80555**  
 Client ID: **BATCH** Batch ID: **38841** Analysis Date: **12/15/2022** SeqNo: **1665613**

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
1,4-Dichlorobenzene	1,740	30.3	2,021	0	86.1	14.1	122	1,499	14.9	50	
1,2-Dichlorobenzene	1,750	40.4	2,021	0	86.9	18.6	122	1,493	16.1	50	
Benzyl alcohol	165	152	2,021	0	8.17	5	142	169.3	2.54	50	
2-Methylphenol (o-cresol)	1,660	40.4	2,021	0	82.1	36.5	121	1,407	16.4	50	
Hexachloroethane	1,710	40.4	2,021	0	84.7	9.86	123	1,485	14.2	50	
N-Nitrosodi-n-propylamine	1,700	80.8	2,021	0	84.0	29.5	128	1,448	15.9	50	
3&4-Methylphenol (m, p-cresol)	1,670	30.3	2,021	0	82.4	30.6	127	1,332	22.3	50	
Nitrobenzene	1,730	50.5	2,021	0	85.8	30.8	123	1,490	15.1	50	
Isophorone	1,730	40.4	2,021	0	85.4	30.8	128	1,488	14.8	50	
2-Nitrophenol	1,860	30.3	2,021	0	91.9	30.3	126	1,630	13.0	50	
2,4-Dimethylphenol	1,700	30.3	2,021	0	84.1	32.2	120	1,485	13.5	50	
Bis(2-chloroethoxy)methane	1,740	30.3	2,021	0	86.2	34.3	120	1,506	14.5	50	
2,4-Dichlorophenol	1,770	30.3	2,021	0	87.4	33.7	123	1,535	14.0	50	
1,2,4-Trichlorobenzene	1,800	30.3	2,021	0	89.2	33.7	116	1,548	15.2	50	
Naphthalene	1,770	40.4	2,021	0	87.6	33.3	119	1,580	11.3	50	
4-Chloroaniline	1,290	30.3	2,021	0	63.9	10.2	120	1,207	6.76	50	
Hexachlorobutadiene	1,830	30.3	2,021	0	90.6	32.2	118	1,618	12.3	50	
4-Chloro-3-methylphenol	1,480	30.3	2,021	0	73.4	35.4	133	1,381	7.15	50	
2-Methylnaphthalene	1,770	30.3	2,021	0	87.5	39.4	117	1,580	11.2	50	
1-Methylnaphthalene	1,770	30.3	2,021	0	87.6	37.1	121	1,590	10.7	50	
Hexachlorocyclopentadiene	1,840	101	2,021	0	90.8	5	134	1,535	17.9	50	
2,4,6-Trichlorophenol	1,830	30.3	2,021	0	90.5	37.2	129	1,606	13.0	50	
2,4,5-Trichlorophenol	1,780	30.3	2,021	0	88.0	37.1	124	1,617	9.48	50	
2-Chloronaphthalene	1,770	30.3	2,021	0	87.5	40.8	117	1,605	9.68	50	
2-Nitroaniline	1,740	50.5	2,021	0	86.0	40.4	131	1,604	8.02	50	
Acenaphthene	1,810	30.3	2,021	0	89.8	34.1	119	1,640	10.1	50	
Dimethylphthalate	1,800	3,540	2,021	0	89.2	37	126	1,699	5.86	50	
2,6-Dinitrotoluene	1,830	40.4	2,021	0	90.8	43.4	123	1,669	9.39	50	
Acenaphthylene	1,790	30.3	2,021	0	88.8	38.5	115	1,641	8.87	50	
2,4-Dinitrophenol	3,100	303	4,041	0	76.7	5	127	2,771	11.2	50	
Dibenzofuran	1,760	30.3	2,021	0	87.1	39	119	1,610	8.92	50	
2,4-Dinitrotoluene	1,800	60.6	2,021	0	89.1	40.1	127	1,696	6.03	50	

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: 2212040-010AMSD	SampType: MSD	Units: µg/Kg-dry				Prep Date: 12/14/2022	RunNo: 80555				
Client ID: BATCH	Batch ID: 38841					Analysis Date: 12/15/2022	SeqNo: 1665613				
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
4-Nitrophenol	1,460	202	2,021	0	72.1	7.49	136	1,468	0.673	50	
Fluorene	1,750	30.3	2,021	0	86.4	34.2	124	1,604	8.52	50	
4-Chlorophenyl phenyl ether	1,800	30.3	2,021	0	89.1	38.8	124	1,656	8.32	50	
Diethylphthalate	1,670	758	2,021	0	82.9	40.1	122	1,567	6.66	50	
4,6-Dinitro-2-methylphenol	1,900	253	2,021	0	94.2	5	142	1,815	4.73	50	
4-Bromophenyl phenyl ether	1,840	30.3	2,021	0	90.9	38.5	124	1,704	7.44	50	
Hexachlorobenzene	1,840	30.3	2,021	0	91.3	40.4	122	1,728	6.47	50	
Pentachlorophenol	1,570	202	2,021	0	77.7	16.6	148	1,435	8.92	50	
Phenanthrene	1,750	30.3	2,021	0	86.6	29.1	128	1,621	7.60	50	
Anthracene	1,750	30.3	2,021	0	86.5	32.5	124	1,652	5.63	50	
Carbazole	1,790	30.3	2,021	0	88.4	33.5	126	1,695	5.20	50	
Di-n-butylphthalate	1,730	30.3	2,021	0	85.4	38.3	134	1,626	5.98	50	
Fluoranthene	1,820	30.3	2,021	0	89.9	30	132	1,718	5.57	50	
Pyrene	1,810	152	2,021	0	89.8	30.9	130	1,725	5.00	50	
Butyl Benzylphthalate	1,810	50.5	2,021	0	89.8	35	147	1,721	5.31	50	
bis(2-Ethylhexyl)adipate	1,770	202	2,021	0	87.6	34.2	149	1,646	7.29	50	
Benz(a)anthracene	2,000	30.3	2,021	0	98.8	25	134	1,873	6.33	50	
Chrysene	1,720	50.5	2,021	0	85.1	28.6	125	1,634	5.07	50	
bis (2-Ethylhexyl) phthalate	1,650	40.4	2,021	0	81.5	22.9	158	1,542	6.58	50	
Di-n-octyl phthalate	1,700	75.8	2,021	0	84.1	36.9	157	1,607	5.57	50	
Benzo(b)fluoranthene	1,810	101	2,021	0	89.5	21.4	140	1,766	2.39	50	
Benzo(k)fluoranthene	1,870	30.3	2,021	0	92.3	20.2	139	1,742	6.84	50	
Benzo(a)pyrene	1,880	40.4	2,021	0	92.9	17.6	149	1,749	7.06	50	
Indeno(1,2,3-cd)pyrene	1,760	202	2,021	0	87.3	22.7	139	1,663	5.89	50	
Dibenz(a,h)anthracene	1,900	101	2,021	0	94.0	23.7	145	1,785	6.16	50	
Benzo(g,h,i)perylene	1,560	101	2,021	0	77.4	18.6	134	1,420	9.64	50	
Surr: 2,4,6-Tribromophenol	1,810		2,021		89.4	16.2	150		0		
Surr: 2-Fluorobiphenyl	885		1,010		87.6	25.3	139		0		
Surr: Nitrobenzene-d5	825		1,010		81.6	12.7	143		0		
Surr: Phenol-d6	1,570		2,021		77.8	21.4	139		0		
Surr: p-Terphenyl	895		1,010		88.6	37.1	144		0		

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38771</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80581</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/16/2022</b>	SeqNo: <b>1666149</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexachlorocyclopentadiene	ND	100									
bis(2-Ethylhexyl)adipate	ND	200									
bis (2-Ethylhexyl) phthalate	ND	40.0									
Di-n-octyl phthalate	ND	75.0									
Surr: 2,4,6-Tribromophenol	1,710		2,000		85.5	16.2	150				
Surr: 2-Fluorobiphenyl	1,010		1,000		101	25.3	139				
Surr: Nitrobenzene-d5	911		1,000		91.1	12.7	143				
Surr: Phenol-d6	1,740		2,000		87.0	21.4	139				
Surr: p-Terphenyl	1,010		1,000		101	37.1	144				

Sample ID: <b>LCS-38771</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80581</b>							
Client ID: <b>LCSS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/16/2022</b>	SeqNo: <b>1666150</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexachlorocyclopentadiene	1,530	100	2,000	0	76.7	34.7	141				
bis(2-Ethylhexyl)adipate	1,610	200	2,000	0	80.5	51	133				
bis (2-Ethylhexyl) phthalate	1,520	40.0	2,000	0	75.9	51.2	137				
Di-n-octyl phthalate	1,400	75.0	2,000	0	69.8	48.1	152				
Surr: 2,4,6-Tribromophenol	1,810		2,000		90.6	16.2	150				
Surr: 2-Fluorobiphenyl	899		1,000		89.9	25.3	139				
Surr: Nitrobenzene-d5	843		1,000		84.3	12.7	143				
Surr: Phenol-d6	1,560		2,000		77.8	21.4	139				
Surr: p-Terphenyl	995		1,000		99.5	37.1	144				

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80581</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/16/2022</b>	SeqNo: <b>1666156</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexachlorocyclopentadiene	1,790	128	2,553	0	70.2	5	134				
bis(2-Ethylhexyl)adipate	1,830	255	2,553	0	71.5	34.2	149				
bis (2-Ethylhexyl) phthalate	1,730	51.1	2,553	0	67.8	22.9	158				



Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80581</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/16/2022</b>	SeqNo: <b>1666156</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Di-n-octyl phthalate	1,660	95.7	2,553	0	65.0	36.9	157				
Surr: 2,4,6-Tribromophenol	2,100		2,553		82.1	16.2	150				
Surr: 2-Fluorobiphenyl	1,050		1,277		82.4	25.3	139				
Surr: Nitrobenzene-d5	984		1,277		77.1	12.7	143				
Surr: Phenol-d6	1,770		2,553		69.4	21.4	139				
Surr: p-Terphenyl	1,130		1,277		88.6	37.1	144				

Sample ID: <b>2211617-012AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80581</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/16/2022</b>	SeqNo: <b>1666157</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Hexachlorocyclopentadiene	1,530	128	2,560	0	59.8	5	134	1,793	15.8	50	
bis(2-Ethylhexyl)adipate	1,550	256	2,560	0	60.7	34.2	149	1,826	16.2	50	
bis (2-Ethylhexyl) phthalate	1,490	51.2	2,560	0	58.4	22.9	158	1,730	14.6	50	
Di-n-octyl phthalate	1,390	96.0	2,560	0	54.2	36.9	157	1,660	17.9	50	
Surr: 2,4,6-Tribromophenol	1,930		2,560		75.2	16.2	150		0		
Surr: 2-Fluorobiphenyl	942		1,280		73.6	25.3	139		0		
Surr: Nitrobenzene-d5	846		1,280		66.1	12.7	143		0		
Surr: Phenol-d6	1,620		2,560		63.2	21.4	139		0		
Surr: p-Terphenyl	1,000		1,280		78.1	37.1	144		0		

Sample ID: <b>MB-38771</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667212</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	ND	30.0									
Bis(2-chloroethyl) ether	ND	50.0									
2-Chlorophenol	ND	40.0									
1,3-Dichlorobenzene	ND	40.0									
1,4-Dichlorobenzene	ND	30.0									
1,2-Dichlorobenzene	ND	40.0									

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38771</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>
Client ID: <b>MBLKS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667212</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzyl alcohol	ND	150									Q
2-Methylphenol (o-cresol)	ND	40.0									
Hexachloroethane	ND	40.0									Q
N-Nitrosodi-n-propylamine	ND	80.0									
3&4-Methylphenol (m, p-cresol)	ND	30.0									
Nitrobenzene	ND	50.0									
Isophorone	ND	40.0									
2-Nitrophenol	ND	30.0									
2,4-Dimethylphenol	ND	30.0									
Bis(2-chloroethoxy)methane	ND	30.0									
2,4-Dichlorophenol	ND	30.0									
1,2,4-Trichlorobenzene	ND	30.0									
Naphthalene	ND	40.0									
4-Chloroaniline	ND	30.0									
Hexachlorobutadiene	ND	30.0									
4-Chloro-3-methylphenol	ND	30.0									
2-Methylnaphthalene	ND	30.0									
1-Methylnaphthalene	ND	30.0									
2,4,6-Trichlorophenol	ND	30.0									
2,4,5-Trichlorophenol	ND	30.0									
2-Chloronaphthalene	ND	30.0									
2-Nitroaniline	ND	50.0									
Acenaphthene	ND	30.0									
Dimethylphthalate	ND	3,500									
2,6-Dinitrotoluene	ND	40.0									
Acenaphthylene	ND	30.0									
2,4-Dinitrophenol	ND	300									
Dibenzofuran	ND	30.0									
2,4-Dinitrotoluene	ND	60.0									
4-Nitrophenol	ND	200									
Fluorene	ND	30.0									
4-Chlorophenyl phenyl ether	ND	30.0									

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>MB-38771</b>	SampType: <b>MBLK</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>							
Client ID: <b>MBLKS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667212</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Diethylphthalate	ND	750									
4,6-Dinitro-2-methylphenol	ND	250									
4-Bromophenyl phenyl ether	ND	30.0									
Hexachlorobenzene	ND	30.0									
Pentachlorophenol	ND	200									Q
Phenanthrene	ND	30.0									
Anthracene	ND	30.0									
Carbazole	ND	30.0									
Di-n-butylphthalate	ND	30.0									
Fluoranthene	ND	30.0									
Pyrene	ND	150									
Butyl Benzylphthalate	ND	50.0									
Benz(a)anthracene	ND	30.0									
Chrysene	ND	50.0									
Benzo(b)fluoranthene	ND	100									
Benzo(k)fluoranthene	ND	30.0									
Benzo(a)pyrene	ND	40.0									
Indeno(1,2,3-cd)pyrene	ND	200									
Dibenz(a,h)anthracene	ND	100									
Benzo(g,h,i)perylene	ND	100									
Surr: 2,4,6-Tribromophenol	1,960		2,000		98.2	16.2	150				
Surr: 2-Fluorobiphenyl	1,040		1,000		104	25.3	139				
Surr: Nitrobenzene-d5	882		1,000		88.2	12.7	143				
Surr: Phenol-d6	1,780		2,000		88.9	21.4	139				
Surr: p-Terphenyl	1,090		1,000		109	37.1	144				

**NOTES:**

Q - Associated calibration verification is below acceptance criteria. Result may be low-biased.

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38771</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>
Client ID: <b>LCSS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667213</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,790	30.0	2,000	0	89.4	54	114				
Bis(2-chloroethyl) ether	1,560	50.0	2,000	0	78.0	60.2	120				
2-Chlorophenol	1,670	40.0	2,000	0	83.7	63.8	111				
1,3-Dichlorobenzene	1,650	40.0	2,000	0	82.5	64.5	110				
1,4-Dichlorobenzene	1,630	30.0	2,000	0	81.6	64.3	112				
1,2-Dichlorobenzene	1,680	40.0	2,000	0	84.0	64.2	112				
Benzyl alcohol	303	150	2,000	0	15.2	5	159				
2-Methylphenol (o-cresol)	1,480	40.0	2,000	0	73.9	51.8	116				
Hexachloroethane	1,400	40.0	2,000	0	70.1	62.1	114				
N-Nitrosodi-n-propylamine	1,550	80.0	2,000	0	77.7	59.1	123				
3&4-Methylphenol (m, p-cresol)	1,540	30.0	2,000	0	76.8	55.3	120				
Nitrobenzene	1,620	50.0	2,000	0	81.1	63.1	119				
Isophorone	1,560	40.0	2,000	0	78.1	63.7	120				
2-Nitrophenol	1,780	30.0	2,000	0	88.9	66.4	116				
2,4-Dimethylphenol	1,550	30.0	2,000	0	77.5	55.5	112				
Bis(2-chloroethoxy)methane	1,610	30.0	2,000	0	80.7	64.6	112				
2,4-Dichlorophenol	1,650	30.0	2,000	0	82.3	57.1	116				
1,2,4-Trichlorobenzene	1,730	30.0	2,000	0	86.5	64.7	110				
Naphthalene	1,690	40.0	2,000	0	84.6	64.7	110				
4-Chloroaniline	1,490	30.0	2,000	0	74.7	64.6	112				
Hexachlorobutadiene	1,760	30.0	2,000	0	88.1	64.7	116				
4-Chloro-3-methylphenol	1,490	30.0	2,000	0	74.4	50.9	128				
2-Methylnaphthalene	1,700	30.0	2,000	0	85.2	63.6	119				
1-Methylnaphthalene	1,700	30.0	2,000	0	84.9	64.1	114				
2,4,6-Trichlorophenol	1,830	30.0	2,000	0	91.5	60.9	123				
2,4,5-Trichlorophenol	1,700	30.0	2,000	0	85.1	48.7	128				
2-Chloronaphthalene	1,690	30.0	2,000	0	84.7	65.4	114				
2-Nitroaniline	1,670	50.0	2,000	0	83.3	62.3	127				
Acenaphthene	1,740	30.0	2,000	0	87.1	63.3	118				
Dimethylphthalate	1,740	3,500	2,000	0	86.8	61.9	123				
2,6-Dinitrotoluene	1,740	40.0	2,000	0	87.2	64.6	123				
Acenaphthylene	1,720	30.0	2,000	0	86.2	61.9	112				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>LCS-38771</b>	SampType: <b>LCS</b>	Units: <b>µg/Kg</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>
Client ID: <b>LCSS</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667213</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrophenol	2,760	300	4,000	0	69.0	5	132				
Dibenzofuran	1,710	30.0	2,000	0	85.6	60.2	116				
2,4-Dinitrotoluene	1,740	60.0	2,000	0	86.8	63.4	124				
4-Nitrophenol	1,510	200	2,000	0	75.5	8.76	130				
Fluorene	1,690	30.0	2,000	0	84.5	62.4	115				
4-Chlorophenyl phenyl ether	1,750	30.0	2,000	0	87.5	58.8	121				
Diethylphthalate	1,580	750	2,000	0	79.2	61.9	111				
4,6-Dinitro-2-methylphenol	1,720	250	2,000	0	86.1	5	134				
4-Bromophenyl phenyl ether	1,830	30.0	2,000	0	91.3	59.1	118				
Hexachlorobenzene	1,780	30.0	2,000	0	88.8	60.4	119				
Pentachlorophenol	1,260	200	2,000	0	63.2	26.5	130				
Phenanthrene	1,680	30.0	2,000	0	83.9	57.9	116				
Anthracene	1,660	30.0	2,000	0	83.2	56.1	118				
Carbazole	1,730	30.0	2,000	0	86.3	48.9	128				
Di-n-butylphthalate	1,620	30.0	2,000	0	81.1	58.9	123				
Fluoranthene	1,690	30.0	2,000	0	84.7	54.7	126				
Pyrene	1,670	150	2,000	0	83.5	53.5	126				
Butyl Benzylphthalate	1,590	50.0	2,000	0	79.3	54.4	131				
Benz(a)anthracene	1,820	30.0	2,000	0	91.0	40.1	140				
Chrysene	1,660	50.0	2,000	0	83.0	59.7	116				
Benzo(b)fluoranthene	1,860	100	2,000	0	93.2	57.9	122				
Benzo(k)fluoranthene	1,820	30.0	2,000	0	90.9	49	124				
Benzo(a)pyrene	1,920	40.0	2,000	0	95.8	53	108				
Indeno(1,2,3-cd)pyrene	2,120	200	2,000	0	106	56	124				
Dibenz(a,h)anthracene	2,350	100	2,000	0	117	55.8	125				
Benzo(g,h,i)perylene	1,800	100	2,000	0	90.2	61.3	112				
Surr: 2,4,6-Tribromophenol	1,990		2,000		99.4	16.2	150				
Surr: 2-Fluorobiphenyl	903		1,000		90.3	25.3	139				
Surr: Nitrobenzene-d5	829		1,000		82.9	12.7	143				
Surr: Phenol-d6	1,610		2,000		80.7	21.4	139				
Surr: p-Terphenyl	966		1,000		96.6	37.1	144				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667218</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

Phenol	1,880	38.3	2,553	0	73.5	31.6	121				
Bis(2-chloroethyl) ether	1,730	63.8	2,553	0	67.9	26.1	123				
2-Chlorophenol	1,850	51.1	2,553	0	72.7	26.8	122				
1,3-Dichlorobenzene	1,700	51.1	2,553	0	66.8	13	122				
1,4-Dichlorobenzene	1,720	38.3	2,553	0	67.5	14.1	122				
1,2-Dichlorobenzene	1,740	51.1	2,553	0	68.2	18.6	122				
Benzyl alcohol	110	191	2,553	0	4.31	5	142				S
2-Methylphenol (o-cresol)	1,550	51.1	2,553	0	60.6	36.5	121				
Hexachloroethane	1,510	51.1	2,553	0	59.0	9.86	123				
N-Nitrosodi-n-propylamine	1,770	102	2,553	0	69.2	29.5	128				
3&4-Methylphenol (m, p-cresol)	1,650	38.3	2,553	0	64.4	30.6	127				
Nitrobenzene	1,820	63.8	2,553	0	71.5	30.8	123				
Isophorone	1,790	51.1	2,553	0	70.2	30.8	128				
2-Nitrophenol	2,000	38.3	2,553	0	78.2	30.3	126				
2,4-Dimethylphenol	1,380	38.3	2,553	0	53.9	32.2	120				
Bis(2-chloroethoxy)methane	1,840	38.3	2,553	0	72.1	34.3	120				
2,4-Dichlorophenol	1,870	38.3	2,553	0	73.4	33.7	123				
1,2,4-Trichlorobenzene	1,920	38.3	2,553	0	75.4	33.7	116				
Naphthalene	1,950	51.1	2,553	0	76.3	33.3	119				
4-Chloroaniline	1,430	38.3	2,553	0	56.1	10.2	120				
Hexachlorobutadiene	1,960	38.3	2,553	0	76.8	32.2	118				
4-Chloro-3-methylphenol	1,710	38.3	2,553	0	66.8	35.4	133				
2-Methylnaphthalene	1,960	38.3	2,553	0	76.8	39.4	117				
1-Methylnaphthalene	1,950	38.3	2,553	0	76.4	37.1	121				
2,4,6-Trichlorophenol	2,020	38.3	2,553	0	79.3	37.2	129				
2,4,5-Trichlorophenol	1,980	38.3	2,553	0	77.5	37.1	124				
2-Chloronaphthalene	1,970	38.3	2,553	0	77.2	40.8	117				
2-Nitroaniline	1,920	63.8	2,553	0	75.1	40.4	131				
Acenaphthene	1,990	38.3	2,553	0	78.1	34.1	119				
Dimethylphthalate	2,000	4,470	2,553	0	78.2	37	126				
2,6-Dinitrotoluene	2,020	51.1	2,553	0	79.0	43.4	123				
Acenaphthylene	1,970	38.3	2,553	0	77.2	38.5	115				

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667218</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4-Dinitrophenol	2,980	383	5,106	0	58.5	5	127				
Dibenzofuran	1,980	38.3	2,553	0	77.7	39	119				
2,4-Dinitrotoluene	1,950	76.6	2,553	0	76.4	40.1	127				
4-Nitrophenol	1,780	255	2,553	0	69.8	7.49	136				
Fluorene	1,950	38.3	2,553	0	76.5	34.2	124				
4-Chlorophenyl phenyl ether	2,050	38.3	2,553	0	80.3	38.8	124				
Diethylphthalate	1,820	957	2,553	0	71.2	40.1	122				
4,6-Dinitro-2-methylphenol	1,960	319	2,553	0	76.8	5	142				
4-Bromophenyl phenyl ether	2,090	38.3	2,553	0	81.7	38.5	124				
Hexachlorobenzene	2,140	38.3	2,553	0	83.6	40.4	122				
Pentachlorophenol	1,690	255	2,553	0	66.1	16.6	148				
Phenanthrene	1,950	38.3	2,553	0	76.5	29.1	128				
Anthracene	1,910	38.3	2,553	0	74.8	32.5	124				
Carbazole	1,970	38.3	2,553	0	77.2	33.5	126				
Di-n-butylphthalate	1,840	38.3	2,553	0	72.2	38.3	134				
Fluoranthene	1,950	38.3	2,553	0	76.3	30	132				
Pyrene	1,920	191	2,553	0	75.2	30.9	130				
Butyl Benzylphthalate	1,800	63.8	2,553	0	70.6	35	147				
Benz(a)anthracene	2,090	38.3	2,553	0	82.0	25	134				
Chrysene	1,880	63.8	2,553	0	73.8	28.6	125				
Benzo(b)fluoranthene	2,010	128	2,553	0	78.6	21.4	140				
Benzo(k)fluoranthene	2,080	38.3	2,553	0	81.6	20.2	139				
Benzo(a)pyrene	2,090	51.1	2,553	0	81.9	17.6	149				
Indeno(1,2,3-cd)pyrene	2,480	255	2,553	0	97.0	22.7	139				
Dibenz(a,h)anthracene	2,820	128	2,553	0	110	23.7	145				
Benzo(g,h,i)perylene	2,130	128	2,553	0	83.4	18.6	134				
Surr: 2,4,6-Tribromophenol	2,320		2,553		91.0	16.2	150				
Surr: 2-Fluorobiphenyl	1,070		1,277		84.2	25.3	139				
Surr: Nitrobenzene-d5	973		1,277		76.2	12.7	143				
Surr: Phenol-d6	1,830		2,553		71.6	21.4	139				
Surr: p-Terphenyl	1,090		1,277		85.4	37.1	144				



Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-012AMS</b>	SampType: <b>MS</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667218</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

**NOTES:**  
 S - Outlying spike recovery(ies) observed.

Sample ID: <b>2211617-012AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>							
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667219</b>							
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Phenol	1,350	38.4	2,560	0	52.8	31.6	121	1,876	32.4	50	
Bis(2-chloroethyl) ether	1,490	64.0	2,560	0	58.1	26.1	123	1,733	15.3	50	
2-Chlorophenol	1,600	51.2	2,560	0	62.5	26.8	122	1,855	14.7	50	
1,3-Dichlorobenzene	1,310	51.2	2,560	0	51.3	13	122	1,705	25.9	50	
1,4-Dichlorobenzene	1,410	38.4	2,560	0	54.9	14.1	122	1,724	20.3	50	
1,2-Dichlorobenzene	1,360	51.2	2,560	0	53.3	18.6	122	1,740	24.2	50	
Benzyl alcohol	78.8	192	2,560	0	3.08	5	142	110.1	33.1	50	S
2-Methylphenol (o-cresol)	1,390	51.2	2,560	0	54.4	36.5	121	1,548	10.6	50	
Hexachloroethane	1,220	51.2	2,560	0	47.6	9.86	123	1,505	21.1	50	
N-Nitrosodi-n-propylamine	1,520	102	2,560	0	59.3	29.5	128	1,767	15.2	50	
3&4-Methylphenol (m, p-cresol)	1,520	38.4	2,560	0	59.4	30.6	127	1,645	7.86	50	
Nitrobenzene	1,570	64.0	2,560	0	61.3	30.8	123	1,825	15.1	50	
Isophorone	1,520	51.2	2,560	0	59.5	30.8	128	1,791	16.2	50	
2-Nitrophenol	1,760	38.4	2,560	0	68.7	30.3	126	1,997	12.7	50	
2,4-Dimethylphenol	1,230	38.4	2,560	0	48.0	32.2	120	1,376	11.3	50	
Bis(2-chloroethoxy)methane	1,620	38.4	2,560	0	63.1	34.3	120	1,841	13.0	50	
2,4-Dichlorophenol	1,670	38.4	2,560	0	65.2	33.7	123	1,874	11.6	50	
1,2,4-Trichlorobenzene	1,650	38.4	2,560	0	64.6	33.7	116	1,925	15.2	50	
Naphthalene	1,680	51.2	2,560	0	65.5	33.3	119	1,947	14.9	50	
4-Chloroaniline	1,310	38.4	2,560	0	51.2	10.2	120	1,433	8.99	50	
Hexachlorobutadiene	1,720	38.4	2,560	0	67.1	32.2	118	1,961	13.2	50	
4-Chloro-3-methylphenol	1,480	38.4	2,560	0	57.8	35.4	133	1,706	14.2	50	
2-Methylnaphthalene	1,670	38.4	2,560	0	65.4	39.4	117	1,960	15.8	50	
1-Methylnaphthalene	1,710	38.4	2,560	0	66.7	37.1	121	1,951	13.3	50	
2,4,6-Trichlorophenol	1,760	38.4	2,560	0	68.9	37.2	129	2,024	13.8	50	

Work Order: 2212039  
 CLIENT: Libby Environmental  
 Project: Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-012AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667219</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
2,4,5-Trichlorophenol	1,760	38.4	2,560	0	68.9	37.1	124	1,978	11.4	50	
2-Chloronaphthalene	1,720	38.4	2,560	0	67.1	40.8	117	1,970	13.6	50	
2-Nitroaniline	1,660	64.0	2,560	0	64.9	40.4	131	1,918	14.4	50	
Acenaphthene	1,740	38.4	2,560	0	67.9	34.1	119	1,994	13.7	50	
Dimethylphthalate	1,760	4,480	2,560	0	68.6	37	126	1,996	12.8	50	
2,6-Dinitrotoluene	1,810	51.2	2,560	0	70.5	43.4	123	2,018	11.1	50	
Acenaphthylene	1,730	38.4	2,560	0	67.7	38.5	115	1,971	12.8	50	
2,4-Dinitrophenol	2,630	384	5,120	0	51.4	5	127	2,985	12.6	50	
Dibenzofuran	1,740	38.4	2,560	0	68.1	39	119	1,983	12.8	50	
2,4-Dinitrotoluene	1,760	76.8	2,560	0	68.6	40.1	127	1,951	10.5	50	
4-Nitrophenol	1,570	256	2,560	0	61.4	7.49	136	1,782	12.5	50	
Fluorene	1,700	38.4	2,560	0	66.5	34.2	124	1,954	13.7	50	
4-Chlorophenyl phenyl ether	1,790	38.4	2,560	0	69.8	38.8	124	2,050	13.6	50	
Diethylphthalate	1,580	960	2,560	0	61.7	40.1	122	1,817	14.0	50	
4,6-Dinitro-2-methylphenol	1,790	320	2,560	0	70.0	5	142	1,960	9.02	50	
4-Bromophenyl phenyl ether	1,830	38.4	2,560	0	71.5	38.5	124	2,086	13.1	50	
Hexachlorobenzene	1,780	38.4	2,560	0	69.6	40.4	122	2,136	18.0	50	
Pentachlorophenol	1,390	256	2,560	0	54.2	16.6	148	1,688	19.5	50	
Phenanthrene	1,720	38.4	2,560	0	67.1	29.1	128	1,952	12.8	50	
Anthracene	1,690	38.4	2,560	0	65.8	32.5	124	1,911	12.5	50	
Carbazole	1,760	38.4	2,560	0	68.7	33.5	126	1,970	11.3	50	
Di-n-butylphthalate	1,590	38.4	2,560	0	62.1	38.3	134	1,843	14.8	50	
Fluoranthene	1,670	38.4	2,560	0	65.2	30	132	1,947	15.3	50	
Pyrene	1,690	192	2,560	0	66.0	30.9	130	1,921	12.8	50	
Butyl Benzylphthalate	1,570	64.0	2,560	0	61.2	35	147	1,803	14.0	50	
Benz(a)anthracene	1,850	38.4	2,560	0	72.4	25	134	2,095	12.2	50	
Chrysene	1,670	64.0	2,560	0	65.4	28.6	125	1,883	11.7	50	
Benzo(b)fluoranthene	1,820	128	2,560	0	70.9	21.4	140	2,007	10.0	50	
Benzo(k)fluoranthene	1,800	38.4	2,560	0	70.3	20.2	139	2,083	14.6	50	
Benzo(a)pyrene	1,800	51.2	2,560	0	70.3	17.6	149	2,090	15.0	50	
Indeno(1,2,3-cd)pyrene	2,120	256	2,560	0	82.9	22.7	139	2,476	15.4	50	
Dibenz(a,h)anthracene	2,410	128	2,560	0	94.2	23.7	145	2,819	15.5	50	

**Work Order:** 2212039  
**CLIENT:** Libby Environmental  
**Project:** Solid Wood Inc.

**QC SUMMARY REPORT**  
**Semivolatile Organic Compounds by EPA Method 8270**

Sample ID: <b>2211617-012AMSD</b>	SampType: <b>MSD</b>	Units: <b>µg/Kg-dry</b>	Prep Date: <b>12/9/2022</b>	RunNo: <b>80626</b>
Client ID: <b>BATCH</b>	Batch ID: <b>38771</b>		Analysis Date: <b>12/20/2022</b>	SeqNo: <b>1667219</b>

Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benzo(g,h,i)perylene	1,800	128	2,560	0	70.4	18.6	134	2,131	16.7	50	
Surr: 2,4,6-Tribromophenol	2,070		2,560		80.8	16.2	150		0		
Surr: 2-Fluorobiphenyl	963		1,280		75.2	25.3	139		0		
Surr: Nitrobenzene-d5	828		1,280		64.7	12.7	143		0		
Surr: Phenol-d6	1,590		2,560		61.9	21.4	139		0		
Surr: p-Terphenyl	965		1,280		75.4	37.1	144		0		

**NOTES:**

S - Outlying spike recovery(ies) observed.

Client Name: LIBBY	Work Order Number: 2212039
Logged by: Elisabeth Samoray	Date Received: 12/1/2022 2:21:00 PM

**Chain of Custody**

1. Is Chain of Custody complete?      Yes       No       Not Present
2. How was the sample delivered?      Client

**Log In**

3. Coolers are present?      Yes       No       NA
4. Shipping container/cooler in good condition?      Yes       No
5. Custody Seals present on shipping container/cooler?  
(Refer to comments for Custody Seals not intact)      Yes       No       Not Present
6. Was an attempt made to cool the samples?      Yes       No       NA
7. Were all items received at a temperature of >2°C to 6°C \*      Yes       No       NA
8. Sample(s) in proper container(s)?      Yes       No
9. Sufficient sample volume for indicated test(s)?      Yes       No
10. Are samples properly preserved?      Yes       No
11. Was preservative added to bottles?      Yes       No       NA
12. Is there headspace in the VOA vials?      Yes       No       NA
13. Did all samples containers arrive in good condition(unbroken)?      Yes       No
14. Does paperwork match bottle labels?      Yes       No
15. Are matrices correctly identified on Chain of Custody?      Yes       No
16. Is it clear what analyses were requested?      Yes       No
17. Were all holding times able to be met?      Yes       No

**Special Handling (if applicable)**

18. Was client notified of all discrepancies with this order?      Yes       No       NA

Person Notified:	<input type="text"/>	Date:	<input type="text"/>
By Whom:	<input type="text"/>	Via:	<input type="checkbox"/> eMail <input type="checkbox"/> Phone <input type="checkbox"/> Fax <input type="checkbox"/> In Person
Regarding:	<input type="text"/>		
Client Instructions:	<input type="text"/>		

19. Additional remarks:

**Item Information**

Item #	Temp °C
Sample 1	2.3

\* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K124**

**Sending Laboratory:**

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154  
  
Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

**Subcontracted Laboratory:**

2212039

Fremont Analytical, Inc.  
3600 Fremont Ave N  
Seattle, WA 98103  
Phone: (206) 352-3790  
Fax:  
  
Requested Turnaround (TAT) Standard

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

**Client Sample ID: WB-SO-SD70-0005**    *Soil Sampled: 11/30/2022 08:30*    Lab ID: L22K124-01

8270 SVOC	Report to MDL
TOC	
Metals SUB Ag	6000 method please
Metals SUB As	6000 method please
Metals SUB Cd	6000 method please
Metals SUB Cr	6000 method please
Metals SUB Cu	6000 method please
Metals SUB Pb	6000 method please
Metals SUB Zn	6000 method please
Grain Size	

*Containers Supplied:*

**Client Sample ID: WB-SO-SD71-0005**    *Soil Sampled: 11/30/2022 09:05*    Lab ID: L22K124-02

8270 SVOC	Report to MDL
TOC	
Metals SUB Cu	6000 method please
Metals SUB Pb	6000 method please
Metals SUB Cr	6000 method please
Metals SUB As	6000 method please
Metals SUB Ag	6000 method please
Metals SUB Cd	6000 method please
Metals SUB Zn	6000 method please
Grain Size	

*Containers Supplied:*

**Client Sample ID: WB-SO-SD72-0005**    *Soil Sampled: 11/30/2022 10:25*    Lab ID: L22K124-03

8270 SVOC	Report to MDL
TOC	
Metals SUB As	6000 method please
Metals SUB Zn	6000 method please

Adrian Anderson    12-1-22  
Released By    Date

[Signature]    12/1/22 1421  
Received By    Date





# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K124  
(Continued)**

**Project:** Solid Wood Inc.

2212039

Analysis	Comments
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**Client Sample ID: WB-SO-SD72-0005**    *Soil Sampled: 11/30/2022 10:25*    Lab ID: L22K124-03

Metals SUB Pb	6000 method please
Metals SUB Cu	6000 method please
Metals SUB Cd	6000 method please
Metals SUB Ag	6000 method please
Metals SUB Cr	6000 method please
Grain Size	

*Containers Supplied:*

**Client Sample ID: WB-SO-SD72-1005**    *Soil Sampled: 11/30/2022 10:25*    Lab ID: L22K124-04

8270 SVOC	Report to MDL
TOC	
Metals SUB Cd	6000 method please
Metals SUB Ag	6000 method please
Metals SUB Cr	6000 method please
Metals SUB Cu	6000 method please
Metals SUB Pb	6000 method please
Metals SUB Zn	6000 method please
Metals SUB As	6000 method please
Grain Size	

*Containers Supplied:*

**Client Sample ID: WB-SO-SD73-0005**    *Soil Sampled: 11/30/2022 09:35*    Lab ID: L22K124-05

8270 SVOC	Report to MDL
TOC	
Metals SUB Cr	6000 method please
Metals SUB Zn	6000 method please
Metals SUB Cu	6000 method please
Metals SUB Cd	6000 method please
Metals SUB As	6000 method please
Metals SUB Ag	6000 method please
Metals SUB Pb	6000 method please
Grain Size	

*Containers Supplied:*

**Client Sample ID: WB-SO-SD74-0005**    *Soil Sampled: 11/30/2022 11:15*    Lab ID: L22K124-06

8270 SVOC	Report to MDL
TOC	
Metals SUB Cd	6000 method please
Metals SUB Zn	6000 method please

*Adrie Childress*  
Released By

12-1-22  
Date

*[Signature]*  
Received By

12/1/22 1421  
Date



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K124  
(Continued)**

**Project:** Solid Wood Inc.

2212039

Analysis	Comments
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**Client Sample ID: WB-SO-SD74-0005** Soil Sampled: 11/30/2022 11:15

Lab ID: L22K124-06

Metals SUB Pb	6000 method please
Metals SUB Cu	6000 method please
Metals SUB Cr	6000 method please
Metals SUB Ag	6000 method please
Metals SUB As	6000 method please
Grain Size	6000 method please

Containers Supplied:

**Client Sample ID: WB-SO-SD75-0005** Soil Sampled: 11/30/2022 11:45

Lab ID: L22K124-07

8270 SVOC	Report to MDL
TOC	
Metals SUB As	6000 method please
Metals SUB Cd	6000 method please
Metals SUB Cr	6000 method please
Metals SUB Ag	6000 method please
Metals SUB Cu	6000 method please
Metals SUB Pb	6000 method please
Metals SUB Zn	6000 method please
Grain Size	6000 method please

Containers Supplied:



Released By

12-1-22

Date



Received By

12/1/22  
1461

Date





**Client:** Fremont Analytical, Inc.  
**Address:** 3600 Fremont Avenue N  
Seattle, WA 98103  
**Attn:** Brianna Barnes & Matt Langston  
**Revised on:** \_\_\_\_\_

**Date:** January 3, 2023  
**Project:** Q.C. - Fremont Analytical  
**Project #:** 21S095-01  
**Sample #:** B22-1450 - 1470  
**Date sampled:** November 28 - 30, 2022

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	See Attached Reports	Sulfate Soundness	
	Proctor		Bulk Density & Voids	
	Sand Equivalent		WSDOT Degradation	
	Fracture Count		LA Abrasion	
	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,  
 Alex Eifrig  
 WABO Supervising Laboratory Technician

# Sieve Report

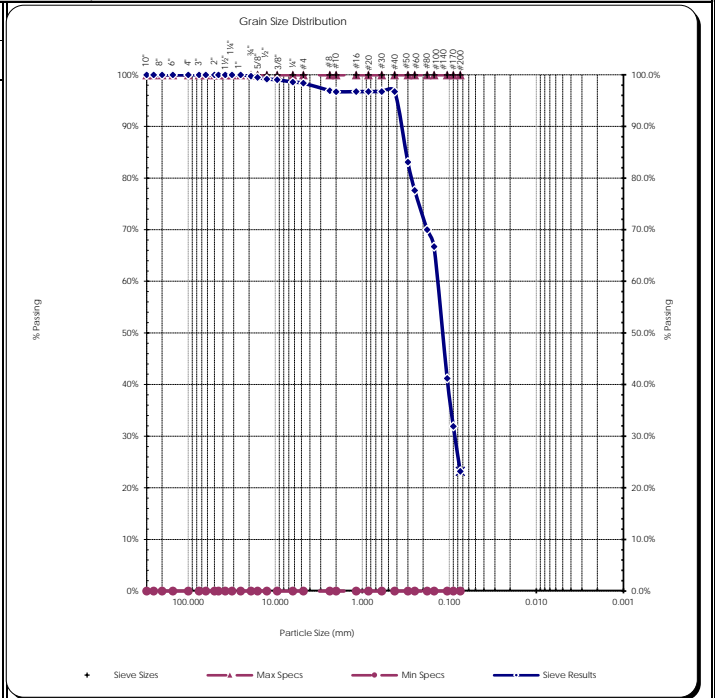
<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-001B, WB-SO-SD70-0005 <b>Sample#:</b> B22-1464	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray
---	--	---



ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>	D <sub>(5)</sub> = 0.016 mm D <sub>(10)</sub> = 0.032 mm D <sub>(15)</sub> = 0.048 mm D <sub>(30)</sub> = 0.087 mm D <sub>(50)</sub> = 0.121 mm D <sub>(60)</sub> = 0.138 mm D <sub>(90)</sub> = 0.363 mm Dust Ratio = 6/25	% Gravel = 1.6% % Sand = 75.2% % Silt & Clay = 23.2% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.68 Coeff. of Uniformity, C <sub>u</sub> = 4.28 Fineness Modulus = 0.63 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
No Specs	Sample Meets Specs ? <b>N/A</b>		

**ASTM C136, ASTM D6913, ASTM C117, ASTM D1140**

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		99%	100.0%	0.0%
1/2"	12.50	99%	99%	100.0%	0.0%
3/8"	9.50	99%	99%	100.0%	0.0%
1/4"	6.30		99%	100.0%	0.0%
#4	4.75	98%	98%	100.0%	0.0%
#8	2.36		97%	100.0%	0.0%
#10	2.00	97%	97%	100.0%	0.0%
#16	1.18		97%	100.0%	0.0%
#20	0.850		97%	100.0%	0.0%
#30	0.600		97%	100.0%	0.0%
#40	0.425	97%	97%	100.0%	0.0%
#50	0.300		83%	100.0%	0.0%
#60	0.250		78%	100.0%	0.0%
#80	0.180		70%	100.0%	0.0%
#100	0.150	67%	67%	100.0%	0.0%
#140	0.106		41%	100.0%	0.0%
#170	0.090		32%	100.0%	0.0%
#200	0.075	23.2%	23.2%	100.0%	0.0%



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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-002B, WB-SO-SD71-0005 <b>Sample#:</b> B22-1465	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray	 ACCREDITED Certificate # 1356.D1
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<b>ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281</b>			
<b>Specifications</b> No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.016 mm D <sub>(10)</sub> = 0.032 mm D <sub>(15)</sub> = 0.048 mm D <sub>(30)</sub> = 0.087 mm D <sub>(50)</sub> = 0.126 mm D <sub>(60)</sub> = 0.146 mm D <sub>(90)</sub> = 1.884 mm Dust Ratio = 2/7	% Gravel = 4.6% % Sand = 71.8% % Silt & Clay = 23.7% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.65 Coeff. of Uniformity, C <sub>u</sub> = 4.59 Fineness Modulus = 1.10 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

<b>ASTM C136, ASTM D6913, ASTM C117, ASTM D1140</b>					
<b>Sieve Size</b>		<b>Actual Cumulative Percent Passing</b>	<b>Interpolated Cumulative Percent Passing</b>	<b>Specs Max</b>	<b>Specs Min</b>
<b>US</b>	<b>Metric</b>				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		99%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		96%	100.0%	0.0%
#4	4.75	95%	95%	100.0%	0.0%
#8	2.36		91%	100.0%	0.0%
#10	2.00	91%	91%	100.0%	0.0%
#16	1.18		86%	100.0%	0.0%
#20	0.850		85%	100.0%	0.0%
#30	0.600		83%	100.0%	0.0%
#40	0.425	82%	82%	100.0%	0.0%
#50	0.300		73%	100.0%	0.0%
#60	0.250		70%	100.0%	0.0%
#80	0.180		65%	100.0%	0.0%
#100	0.150	62%	62%	100.0%	0.0%
#140	0.106		40%	100.0%	0.0%
#170	0.090		31%	100.0%	0.0%
#200	0.075	23.7%	23.7%	100.0%	0.0%

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

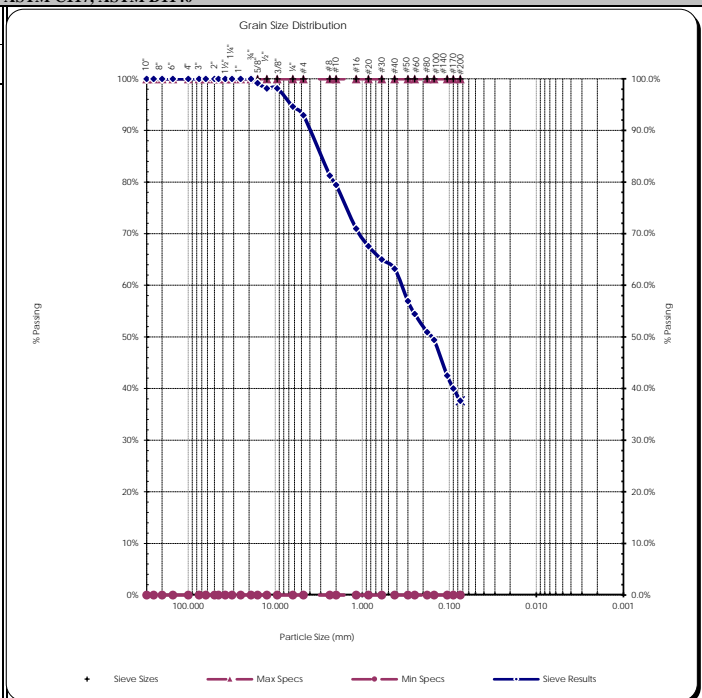
# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-003B, WB-SO-SD72-0005 <b>Sample#:</b> B22-1466	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SC-SM, Silty, Clayey Sand <b>Sample Color:</b> Gray
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<b>ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281</b>			
<b>Specifications</b>	No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.010 mm      % Gravel = 7.1% D <sub>(10)</sub> = 0.020 mm      % Sand = 55.3% D <sub>(15)</sub> = 0.030 mm      % Silt & Clay = 37.7% D <sub>(30)</sub> = 0.060 mm      Liquid Limit = n/a D <sub>(50)</sub> = 0.161 mm      Plasticity Index = n/a D <sub>(60)</sub> = 0.361 mm      Sand Equivalent = n/a D <sub>(90)</sub> = 4.152 mm      Fracture % , 1 Face = n/a Dust Ratio = 59/99      Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 0.50 Coeff. of Uniformity, C <sub>u</sub> = 18.13 Fineness Modulus = 1.85 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

<b>ASTM C136, ASTM D6913, ASTM C117, ASTM D1140</b>					
<b>Sieve Size</b>		<b>Actual Cumulative Percent Passing</b>	<b>Interpolated Cumulative Percent Passing</b>	<b>Specs Max</b>	<b>Specs Min</b>
<b>US</b>	<b>Metric</b>				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		99%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	98%	98%	100.0%	0.0%
1/4"	6.30		95%	100.0%	0.0%
#4	4.75	93%	93%	100.0%	0.0%
#8	2.36		81%	100.0%	0.0%
#10	2.00	79%	79%	100.0%	0.0%
#16	1.18		71%	100.0%	0.0%
#20	0.850		68%	100.0%	0.0%
#30	0.600		65%	100.0%	0.0%
#40	0.425	63%	63%	100.0%	0.0%
#50	0.300		57%	100.0%	0.0%
#60	0.250		54%	100.0%	0.0%
#80	0.180		51%	100.0%	0.0%
#100	0.150	49%	49%	100.0%	0.0%
#140	0.106		43%	100.0%	0.0%
#170	0.090		40%	100.0%	0.0%
#200	0.075	37.7%	37.7%	100.0%	0.0%



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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig

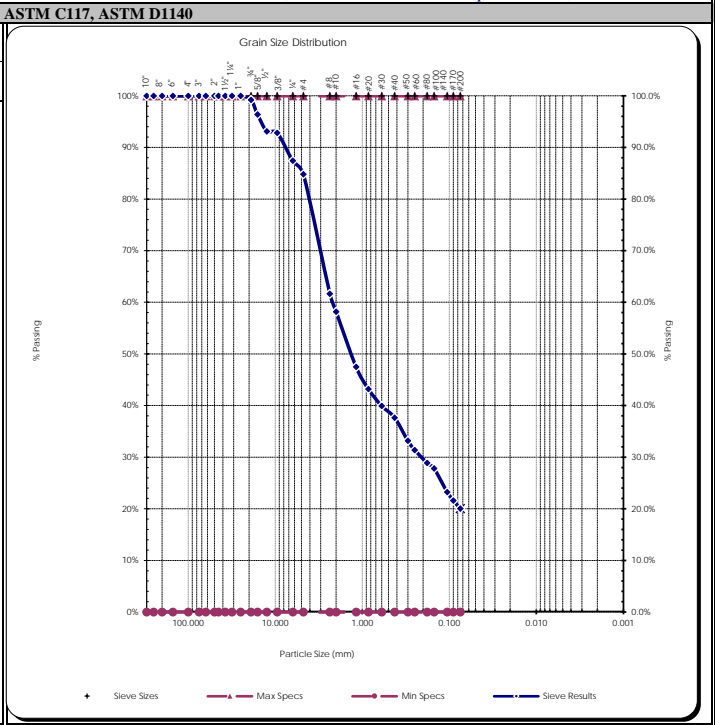
# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-004B, WB-SO-SD72-1005 <b>Sample#:</b> B22-1467	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand with Gravel <b>Sample Color:</b> Gray
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>		D <sub>(5)</sub> = 0.019 mm      % Gravel = 15.2% D <sub>(10)</sub> = 0.037 mm      % Sand = 64.7% D <sub>(15)</sub> = 0.056 mm      % Silt & Clay = 20.1% D <sub>(30)</sub> = 0.211 mm      Liquid Limit = n/a D <sub>(50)</sub> = 1.373 mm      Plasticity Index = n/a D <sub>(60)</sub> = 2.188 mm      Sand Equivalent = n/a D <sub>(90)</sub> = 7.833 mm      Fracture % , 1 Face = n/a Dust Ratio = 8/15      Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 0.55 Coeff. of Uniformity, C <sub>u</sub> = 58.52 Fineness Modulus = 3.13 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
ASTM C136, ASTM D6913, ASTM C117, ASTM D1140			

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	99%	99%	100.0%	0.0%
5/8"	16.00		96%	100.0%	0.0%
1/2"	12.50	93%	93%	100.0%	0.0%
3/8"	9.50	93%	93%	100.0%	0.0%
1/4"	6.30		87%	100.0%	0.0%
#4	4.75	85%	85%	100.0%	0.0%
#8	2.36		62%	100.0%	0.0%
#10	2.00	58%	58%	100.0%	0.0%
#16	1.18		47%	100.0%	0.0%
#20	0.850		43%	100.0%	0.0%
#30	0.600		40%	100.0%	0.0%
#40	0.425	38%	38%	100.0%	0.0%
#50	0.300		33%	100.0%	0.0%
#60	0.250		31%	100.0%	0.0%
#80	0.180		29%	100.0%	0.0%
#100	0.150	28%	28%	100.0%	0.0%
#140	0.106		23%	100.0%	0.0%
#170	0.090		22%	100.0%	0.0%
#200	0.075	20.1%	20.1%	100.0%	0.0%



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

Reviewed by: Alex Eifrig  
 Alex Eifrig

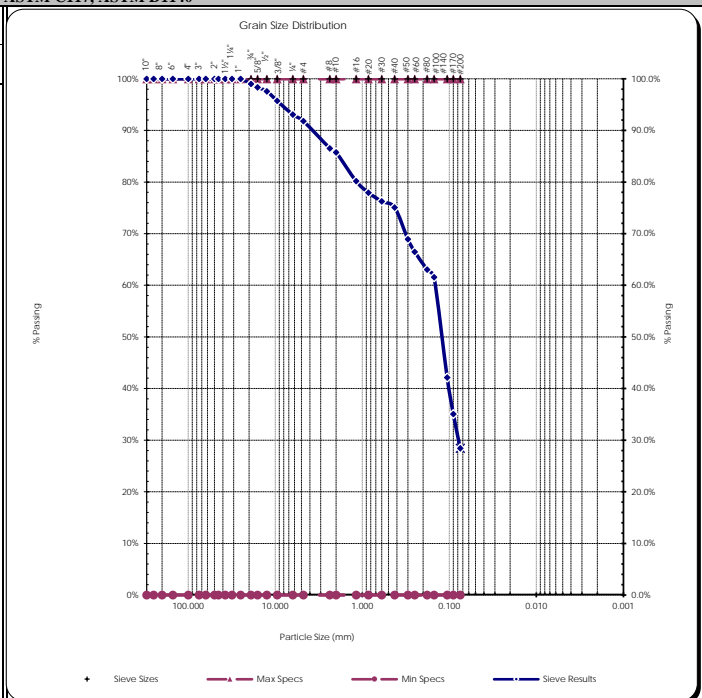
# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-005B, WB-SO-SD73-0005 <b>Sample#:</b> B22-1468	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D-2487</b> SM, Silty Sand <b>Sample Color:</b> Gray
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<b>ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281</b>			
<b>Specifications</b> No Specs  <b>Sample Meets Specs ?</b> N/A	D <sub>(5)</sub> = 0.013 mm D <sub>(10)</sub> = 0.026 mm D <sub>(15)</sub> = 0.040 mm D <sub>(30)</sub> = 0.079 mm D <sub>(50)</sub> = 0.124 mm D <sub>(60)</sub> = 0.146 mm D <sub>(90)</sub> = 3.936 mm Dust Ratio = 25/66	% Gravel = 8.2% % Sand = 63.4% % Silt & Clay = 28.4% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.60 Coeff. of Uniformity, C <sub>u</sub> = 5.55 Fineness Modulus = 1.40 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

<b>ASTM C136, ASTM D6913, ASTM C117, ASTM D1140</b>					
<b>Sieve Size</b>		<b>Actual Cumulative Percent Passing</b>	<b>Interpolated Cumulative Percent Passing</b>	<b>Specs Max</b>	<b>Specs Min</b>
<b>US</b>	<b>Metric</b>				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	99%	99%	100.0%	0.0%
5/8"	16.00		98%	100.0%	0.0%
1/2"	12.50	98%	98%	100.0%	0.0%
3/8"	9.50	96%	96%	100.0%	0.0%
1/4"	6.30		93%	100.0%	0.0%
#4	4.75	92%	92%	100.0%	0.0%
#8	2.36		87%	100.0%	0.0%
#10	2.00	86%	86%	100.0%	0.0%
#16	1.18		80%	100.0%	0.0%
#20	0.850		78%	100.0%	0.0%
#30	0.600		76%	100.0%	0.0%
#40	0.425	75%	75%	100.0%	0.0%
#50	0.300		69%	100.0%	0.0%
#60	0.250		66%	100.0%	0.0%
#80	0.180		63%	100.0%	0.0%
#100	0.150	62%	62%	100.0%	0.0%
#140	0.106		42%	100.0%	0.0%
#170	0.090		35%	100.0%	0.0%
#200	0.075	28.4%	28.4%	100.0%	0.0%



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

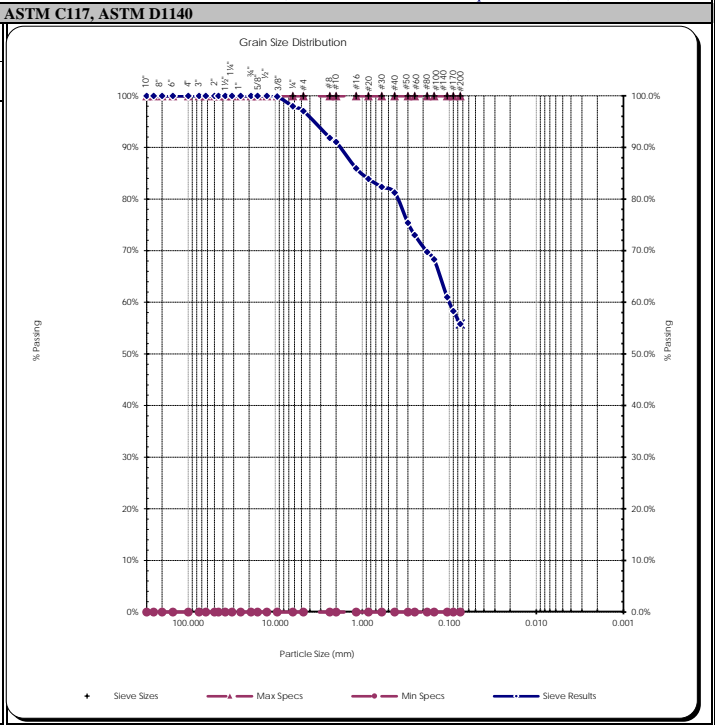
Reviewed by: Alex Eifrig  
 Alex Eifrig

# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-006B, WB-SO-SD74-0005 <b>Sample#:</b> B22-1469	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Visual Soils Classification</b> Silty Sand with Clay <b>Sample Color:</b> Gray	
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b>		D <sub>(5)</sub> = 0.007 mm      % Gravel = 2.9% D <sub>(10)</sub> = 0.013 mm     % Sand = 41.2% D <sub>(15)</sub> = 0.020 mm     % Silt & Clay = 55.8% D <sub>(30)</sub> = 0.040 mm     Liquid Limit = n/a D <sub>(50)</sub> = 0.067 mm     Plasticity Index = n/a D <sub>(60)</sub> = 0.100 mm     Sand Equivalent = n/a D <sub>(90)</sub> = 1.828 mm     Fracture % , 1 Face = n/a Dust Ratio = 68/99     Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.21 Coeff. of Uniformity, C <sub>u</sub> = 7.45 Fineness Modulus = 0.99 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =
ASTM C136, ASTM D6913, ASTM C117, ASTM D1140			

Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		98%	100.0%	0.0%
#4	4.75	97%	97%	100.0%	0.0%
#8	2.36		92%	100.0%	0.0%
#10	2.00	91%	91%	100.0%	0.0%
#16	1.18		86%	100.0%	0.0%
#20	0.850		84%	100.0%	0.0%
#30	0.600		82%	100.0%	0.0%
#40	0.425	81%	81%	100.0%	0.0%
#50	0.300		75%	100.0%	0.0%
#60	0.250		73%	100.0%	0.0%
#80	0.180		70%	100.0%	0.0%
#100	0.150	68%	68%	100.0%	0.0%
#140	0.106		61%	100.0%	0.0%
#170	0.090		58%	100.0%	0.0%
#200	0.075	55.8%	55.8%	100.0%	0.0%



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

Reviewed by: Alex Eifrig  
 Alex Eifrig



# Sieve Report

<b>Project:</b> Q.C. - Fremont Analytical <b>Project #:</b> 21S095-01 <b>Client:</b> Fremont Analytical, Inc. <b>Source:</b> 2212039-007B, WB-SO-SD75-0005 <b>Sample#:</b> B22-1470	<b>Date Received:</b> 23-Dec-22 <b>Sampled By:</b> Client <b>Date Tested:</b> 27-Dec-22 <b>Tested By:</b> K. Mendez	<b>Unified Soils Classification System, ASTM D2487</b> SC-SM, Silty, Clayey Sand <b>Sample Color:</b> Gray	 Certificate # 1356-01
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ASTM D2216, ASTM D2419, ASTM D4318, ASTM D5281			
<b>Specifications</b> No Specs  Sample Meets Specs ? <b>N/A</b>	D <sub>(5)</sub> = 0.008 mm D <sub>(10)</sub> = 0.015 mm D <sub>(15)</sub> = 0.023 mm D <sub>(30)</sub> = 0.046 mm D <sub>(50)</sub> = 0.078 mm D <sub>(60)</sub> = 0.114 mm D <sub>(90)</sub> = 1.329 mm Dust Ratio = 16/27	% Gravel = 0.0% % Sand = 50.8% % Silt & Clay = 49.2% Liquid Limit = n/a Plasticity Index = n/a Sand Equivalent = n/a Fracture % , 1 Face = n/a Fracture % , 2+ Faces = n/a	Coeff. of Curvature, C <sub>c</sub> = 1.21 Coeff. of Uniformity, C <sub>u</sub> = 7.47 Fineness Modulus = 0.84 Plastic Limit = n/a Moisture % , as sampled = n/a Req'd Sand Equivalent = Req'd Fracture % , 1 Face = Req'd Fracture % , 2+ Faces =

ASTM C136, ASTM D6913, ASTM C117, ASTM D1140					
Sieve Size		Actual Cumulative Percent Passing	Interpolated Cumulative Percent Passing	Specs Max	Specs Min
US	Metric				
12.00"	300.00		100%	100.0%	0.0%
10.00"	250.00		100%	100.0%	0.0%
8.00"	200.00		100%	100.0%	0.0%
6.00"	150.00		100%	100.0%	0.0%
4.00"	100.00		100%	100.0%	0.0%
3.00"	75.00		100%	100.0%	0.0%
2.50"	63.00		100%	100.0%	0.0%
2.00"	50.00	100%	100%	100.0%	0.0%
1.75"	45.00		100%	100.0%	0.0%
1.50"	37.50		100%	100.0%	0.0%
1.25"	31.50		100%	100.0%	0.0%
1.00"	25.00	100%	100%	100.0%	0.0%
3/4"	19.00	100%	100%	100.0%	0.0%
5/8"	16.00		100%	100.0%	0.0%
1/2"	12.50	100%	100%	100.0%	0.0%
3/8"	9.50	100%	100%	100.0%	0.0%
1/4"	6.30		100%	100.0%	0.0%
#4	4.75	100%	100%	100.0%	0.0%
#8	2.36		96%	100.0%	0.0%
#10	2.00	95%	95%	100.0%	0.0%
#16	1.18		89%	100.0%	0.0%
#20	0.850		86%	100.0%	0.0%
#30	0.600		84%	100.0%	0.0%
#40	0.425	83%	83%	100.0%	0.0%
#50	0.300		77%	100.0%	0.0%
#60	0.250		75%	100.0%	0.0%
#80	0.180		71%	100.0%	0.0%
#100	0.150	70%	70%	100.0%	0.0%
#140	0.106		58%	100.0%	0.0%
#170	0.090		53%	100.0%	0.0%
#200	0.075	49.2%	49.2%	100.0%	0.0%

Grain Size Distribution

+ Sieve Sizes    — Max Specs    — Min Specs    — Sieve Results

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 All results apply only to actual locations and materials tested. As a mutual protection to clients, the public and ourselves, all reports are submitted as the confidential property of clients, and authorization for publication of statements, conclusions or extracts from or regarding our reports is reserved pending our written approval.

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

Reviewed by: *Alex Eifrig*  
 Alex Eifrig



CHAIN OF CUSTODY RECORD

Omega COCID 1559

PAGE: 1

OF: 1

ADDRESS

10000 1st Avenue, S.  
 Burien, WA 98148  
 TEL: 206-835-8774  
 FAX: 206-835-7175  
 Email: info@fremontanalytical.com

Page 4

SUBMITTER: <b>MTC</b>	CLIENT: <b>Materials Testing and Consulti</b>	STANDARD TEST METHOD(S): Standard TAT. Please email results to Brianna Barnes at <a href="mailto:bbarnes@fremontanalytical.com">bbarnes@fremontanalytical.com</a> and Matt Langston at <a href="mailto:m_langston@fremontanalytical.com">m_langston@fremontanalytical.com</a> .
ADDRESS: <b>777 Chrysler Drive,</b>		
CITY/STATE/ZIP: <b>Burlington, WA 98233</b>		
PHONE: <b>(206) 241-1974</b>		
ACCOUNT#:		

QTY	SAMPLE ID	LOT/LABOR #	CONTAINER	MATRIX	DATE/TIME COLLECTED	COMMENTS (VOL/WT)	TESTS (Method, Pass/Fail, Weight, etc.)
1	2212039-001B PHY-GRAIN	WB-SO-SD70-0005	CLEAR JARS 32	Soil	11/30/2022 8:30:00 AM	1	Grainsize Analysis <b>B22-1464</b>
2	2212039-002B PHY-GRAIN	WB-SO-SD71-0005	CLEAR JARS 32	Soil	11/30/2022 9:05:00 AM	1	Grainsize Analysis <b>B22-1465</b>
3	2212039-003B PHY-GRAIN	WB-SO-SD72-0005	CLEAR JARS 32	Soil	11/30/2022 10:25:00 AM	1	Grainsize Analysis <b>B22-1466</b>
4	2212039-004B PHY-GRAIN	WB-SO-SD72-1005	CLEAR JARS 32	Soil	11/30/2022 10:25:00 AM	1	Grainsize Analysis <b>B22-1467</b>
5	2212039-005B PHY-GRAIN	WB-SO-SD73-0005	CLEAR JARS 32	Soil	11/30/2022 9:35:00 AM	1	Grainsize Analysis <b>B22-1468</b>
6	2212039-006B PHY-GRAIN	WB-SO-SD74-0005	CLEAR JARS 32	Soil	11/30/2022 11:15:00 AM	1	Grainsize Analysis <b>B22-1469</b>
7	2212039-007B PHY-GRAIN	WB-SO-SD75-0005	CLEAR JARS 32	Soil	11/30/2022 11:45:00 AM	1	Grainsize Analysis <b>B22-1470</b>

Released By: <i>Kath A.</i>	Date: 12/22	Time: 9:29	Received By: <i>Alan Eifling</i>	Date: 12/23	Time: 11:20
Released By:	Date:	Time:	Received By:	Date:	Time:
Released By:	Date:	Time:	Received By:	Date:	Time:

TAT: \_\_\_\_\_

RI SH \_\_\_\_\_

Note: RI SH requests will incur surcharge.

REPORT TRANSFER CHARGE

FOR ANALYSIS ONLY

Sample # \_\_\_\_\_

Comments \_\_\_\_\_

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**Analytical Resources, LLC**  
Analytical Chemists and Consultants

21 December 2022

Emily Bushlen  
Libby Environmental  
3322 South Bay Road NE  
Olympia, WA 98506

RE: Dioxin/Furans 2022-2023 (L22K124-Solid Wood Inc)

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

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

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

Associated Work Order(s)  
22L0024

Associated SDG ID(s)  
N/A

**Shelly Fishel** Digitally signed by Shelly Fishel  
Date: 2022.12.21 16:02:03 -08'00'

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

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

Analytical Resources, LLC

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

Shelly Fishel, Project Manager







# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K124**

AR: 22L0024

### Sending Laboratory:

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

### Subcontracted Laboratory:

Analytical Resources, Inc.  
4611 South 134th Place  
Seattle, WA 98109  
Phone: (206) 695-6210  
Fax:

Requested Turnaround (TAT) Standard

**Project:** Solid Wood Inc.

Analysis	Comments
<b>Client Sample ID: WB-SO-SD70-0005</b> <i>Soil Sampled: 11/30/2022 08:30</i> Lab ID: L22K124-01 Dioxins / Furans    Report all isomers and conjurers <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SD71-0005</b> <i>Soil Sampled: 11/30/2022 09:05</i> Lab ID: L22K124-02 Dioxins / Furans    Report all isomers and conjurers <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SD72-0005</b> <i>Soil Sampled: 11/30/2022 10:25</i> Lab ID: L22K124-03 Dioxins / Furans    Report all isomers and conjurers <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SD72-1005</b> <i>Soil Sampled: 11/30/2022 10:25</i> Lab ID: L22K124-04 Dioxins / Furans    Report all isomers and conjurers <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SD73-0005</b> <i>Soil Sampled: 11/30/2022 09:35</i> Lab ID: L22K124-05 Dioxins / Furans    Report all isomers and conjurers <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SD74-0005</b> <i>Soil Sampled: 11/30/2022 11:15</i> Lab ID: L22K124-06 Dioxins / Furans    Report all isomers and conjurers <i>Containers Supplied:</i>	

Sherry Chilcutt  
Released By

12-1-22  
Date

[Signature]  
Received By

12/01/22  
Date



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K124  
(Continued)**

**Project:** Solid Wood Inc.

AR: 22L0024

Analysis	Comments
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<b>Client Sample ID: WB-SO-SD75-0005</b>	<b>Soil Sampled: 11/30/2022 11:45</b>	Lab ID: L22K124-07
--	---------------------------------------	--------------------

Dioxins / Furans

Report all isomers and congener

Containers Supplied:

*Jodie Andrews*  
Released By

12-1-22  
Date

*[Signature]*  
Received By

12/01/22  
Date



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WB-SO-SD70-0005	22L0024-01	Solid	30-Nov-2022 08:30	01-Dec-2022 15:11
WB-SO-SD71-0005	22L0024-02	Solid	30-Nov-2022 09:05	01-Dec-2022 15:11
WB-SO-SD72-0005	22L0024-03	Solid	30-Nov-2022 10:25	01-Dec-2022 15:11
WB-SO-SD72-1005	22L0024-04	Solid	30-Nov-2022 10:25	01-Dec-2022 15:11
WB-SO-SD73-0005	22L0024-05	Solid	30-Nov-2022 09:35	01-Dec-2022 15:11
WB-SO-SD74-0005	22L0024-06	Solid	30-Nov-2022 11:15	01-Dec-2022 15:11
WB-SO-SD75-0005	22L0024-07	Solid	30-Nov-2022 11:45	01-Dec-2022 15:11





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

## Work Order Case Narrative

**Client:** Libby Environmental  
**Project:** Dioxin/Furans 2022-2023  
**Project Number:** L22K124-Solid Wood Inc  
**Work Order:** 22L0024

### Sample receipt

Sample(s) as listed on the preceding page were received 01-Dec-2022 15: 11 under ARI work order 22L0024. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### Dioxin/Furans - EPA Method 8290

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column recently developed by Restek. The RTX-Dioxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

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

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.



# Cooler Receipt Form

ARI Client: Lindy Pavilion

Project Name: L22K124

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

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

Assigned ARI Job No: 22L0024

Tracking No: \_\_\_\_\_ NA

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

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

Time 15.11 17

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID# 2009708

Cooler Accepted by: [Signature] Date: 12/1/22 Time: 15.11

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: \_\_\_\_\_

Was sufficient ice used (if appropriate)? NA YES NO

How were bottles sealed in plastic bags? Individually Grouped Not

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA

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

Samples Logged by: PIB Date: 12/1/22 Time: 16.11 Labels checked by: \_\_\_\_\_

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

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

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD70-0005**  
**22L0024-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 08:30  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 08:17

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 16.26 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-01 A 01 Dry Weight: 10.00 g % Solids: 61.52
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-01 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-01 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-01 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.912	0.655-0.886	0.07	1.00	<b>0.46</b>	ng/kg	EMPC, X, J
2,3,7,8-TCDD		0.457	0.655-0.886	0.06	1.00	<b>0.26</b>	ng/kg	EMPC, J
1,2,3,7,8-PeCDF		1.583	1.318-1.783	0.09	1.00	<b>0.29</b>	ng/kg	J
2,3,4,7,8-PeCDF			1.318-1.783	0.09	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD		1.888	1.318-1.783	0.11	1.00	<b>0.86</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDF		1.143	1.054-1.426	0.05	1.00	<b>1.06</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.080	1.054-1.426	0.05	1.00	<b>0.65</b>	ng/kg	J
2,3,4,6,7,8-HxCDF		1.013	1.054-1.426	0.06	1.00	<b>0.92</b>	ng/kg	EMPC, J
1,2,3,7,8,9-HxCDF		1.215	1.054-1.426	0.07	1.00	<b>0.40</b>	ng/kg	J
1,2,3,4,7,8-HxCDD		1.933	1.054-1.426	0.14	1.00	<b>0.70</b>	ng/kg	EMPC, J
1,2,3,6,7,8-HxCDD		1.374	1.054-1.426	0.14	1.00	<b>3.77</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.237	1.054-1.426	0.15	1.00	<b>2.25</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		1.020	0.893-1.208	0.08	1.00	<b>15.4</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.077	0.893-1.208	0.12	1.00	<b>0.80</b>	ng/kg	J
1,2,3,4,6,7,8-HpCDD		1.089	0.893-1.208	0.19	2.50	<b>53.0</b>	ng/kg	
OCDF		0.954	0.757-1.024	0.12	2.50	<b>19.1</b>	ng/kg	
OCDD		0.840	0.757-1.024	0.21	10.0	<b>360</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>4.08</b>	ng/kg	
Total TCDD					1.00	<b>2.51</b>	ng/kg	
Total PeCDF					1.00	<b>8.67</b>	ng/kg	
Total PeCDD					1.00	<b>3.07</b>	ng/kg	
Total HxCDF					1.00	<b>20.3</b>	ng/kg	
Total HxCDD					1.00	<b>34.2</b>	ng/kg	
Total HpCDF					1.00	<b>36.8</b>	ng/kg	
Total HpCDD					1.00	<b>125</b>	ng/kg	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD70-0005**  
**22L0024-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 08:30

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 08:17

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		2.97		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		2.96		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		2.30		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		1.63		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD70-0005**  
**22L0024-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 08:30

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 08:17

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.735	0.655-0.886	24-169 %	75.6	%	
<i>13C12-2,3,7,8-TCDD</i>		0.760	0.655-0.886	25-164 %	95.2	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.498	1.318-1.783	24-185 %	74.6	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.550	1.318-1.783	21-178 %	74.0	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.581	1.318-1.783	25-181 %	80.7	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.497	0.434-0.587	26-152 %	89.7	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.505	0.434-0.587	26-123 %	89.2	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.509	0.434-0.587	28-136 %	90.7	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.512	0.434-0.587	29-147 %	97.1	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.266	1.054-1.426	32-141 %	91.4	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.257	1.054-1.426	28-130 %	86.6	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.450	0.374-0.506	28-143 %	76.6	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.453	0.374-0.506	26-138 %	78.2	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.072	0.893-1.208	23-140 %	97.1	%	
<i>13C12-OCDD</i>		0.890	0.757-1.024	17-157 %	99.5	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	100	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
--	--	---------------------------------------

**WB-SO-SD70-0005**  
**22L0024-01 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 08:30  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-01  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	61.52	%	





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD71-0005**  
**22L0024-02 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 09:05  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 09:07

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 17.43 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-02 A 01 Dry Weight: 10.02 g % Solids: 57.46
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-02 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-02 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-02 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF			0.655-0.886	0.41	1.00	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.32	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF			1.318-1.783	0.27	1.00	ND	ng/kg	U
2,3,4,7,8-PeCDF			1.318-1.783	0.25	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD		2.095	1.318-1.783	0.37	1.00	1.21	ng/kg	EMPC
1,2,3,4,7,8-HxCDF		1.243	1.054-1.426	0.16	1.00	1.31	ng/kg	
1,2,3,6,7,8-HxCDF		1.052	1.054-1.426	0.16	1.00	1.32	ng/kg	EMPC
2,3,4,6,7,8-HxCDF		1.259	1.054-1.426	0.15	1.00	1.35	ng/kg	
1,2,3,7,8,9-HxCDF			1.054-1.426	0.18	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD		1.007	1.054-1.426	0.33	1.00	0.78	ng/kg	EMPC, J
1,2,3,6,7,8-HxCDD		1.197	1.054-1.426	0.32	1.00	4.68	ng/kg	
1,2,3,7,8,9-HxCDD		1.271	1.054-1.426	0.35	1.00	2.26	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.988	0.893-1.208	0.57	1.00	22.5	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.86	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.004	0.893-1.208	0.67	2.50	58.3	ng/kg	
OCDF		0.874	0.757-1.024	0.16	2.50	22.9	ng/kg	
OCDD		0.865	0.757-1.024	0.32	9.98	392	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	2.84	ng/kg	
Total TCDD					1.00	2.98	ng/kg	
Total PeCDF					1.00	15.9	ng/kg	
Total PeCDD					1.00	1.96	ng/kg	
Total HxCDF					1.00	28.4	ng/kg	
Total HxCDD					1.00	43.1	ng/kg	
Total HpCDF					1.00	45.3	ng/kg	
Total HpCDD					1.00	136	ng/kg	





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD71-0005**  
**22L0024-02 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 09:05

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 09:07

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		3.55		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		3.31		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		2.84		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		1.89		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD71-0005**  
**22L0024-02 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 09:05

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 09:07

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.732	0.655-0.886	24-169 %	43.2	%	
<i>13C12-2,3,7,8-TCDD</i>		0.765	0.655-0.886	25-164 %	60.9	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.555	1.318-1.783	24-185 %	67.9	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.546	1.318-1.783	21-178 %	69.4	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.678	1.318-1.783	25-181 %	77.6	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.499	0.434-0.587	26-152 %	82.8	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.492	0.434-0.587	26-123 %	81.8	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.483	0.434-0.587	28-136 %	88.4	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.502	0.434-0.587	29-147 %	96.5	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.252	1.054-1.426	32-141 %	87.4	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.278	1.054-1.426	28-130 %	79.8	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.439	0.374-0.506	28-143 %	69.6	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.486	0.374-0.506	26-138 %	77.6	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.065	0.893-1.208	23-140 %	92.1	%	
<i>13C12-OCDD</i>		0.899	0.757-1.024	17-157 %	92.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	63.9	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD71-0005**  
**22L0024-02 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 09:05  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-02  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	57.46	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD72-0005**  
**22L0024-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 10:25  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 09:56

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 25.48 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-03 A 01 Dry Weight: 10.01 g % Solids: 39.28
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-03 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-03 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-03 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.708	0.655-0.886	0.06	1.00	<b>0.97</b>	ng/kg	X, J
2,3,7,8-TCDD		0.479	0.655-0.886	0.08	1.00	<b>0.36</b>	ng/kg	EMPC, J
1,2,3,7,8-PeCDF		1.599	1.318-1.783	0.10	1.00	<b>0.66</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.437	1.318-1.783	0.09	1.00	<b>0.65</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.382	1.318-1.783	0.08	1.00	<b>1.67</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.274	1.054-1.426	0.07	1.00	<b>2.67</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.064	1.054-1.426	0.07	1.00	<b>1.66</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.231	1.054-1.426	0.07	1.00	<b>2.48</b>	ng/kg	
1,2,3,7,8,9-HxCDF		0.966	1.054-1.426	0.08	1.00	<b>0.75</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.244	1.054-1.426	0.14	1.00	<b>1.59</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.204	1.054-1.426	0.14	1.00	<b>10.3</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.128	1.054-1.426	0.15	1.00	<b>5.75</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.965	0.893-1.208	0.16	1.00	<b>53.9</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.056	0.893-1.208	0.22	1.00	<b>1.64</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.016	0.893-1.208	0.26	2.50	<b>147</b>	ng/kg	
OCDF		0.893	0.757-1.024	0.11	2.50	<b>54.6</b>	ng/kg	
OCDD		0.922	0.757-1.024	0.28	9.99	<b>1020</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>2.50</b>	ng/kg	
Total TCDD					1.00	<b>5.29</b>	ng/kg	
Total PeCDF					1.00	<b>17.3</b>	ng/kg	
Total PeCDD					1.00	<b>11.0</b>	ng/kg	
Total HxCDF					1.00	<b>61.8</b>	ng/kg	
Total HxCDD					1.00	<b>94.2</b>	ng/kg	
Total HpCDF					1.00	<b>125</b>	ng/kg	
Total HpCDD					1.00	<b>333</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD72-0005**  
**22L0024-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 10:25

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 09:56

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		7.21		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		7.21		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		6.99		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		6.77		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD72-0005**  
**22L0024-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 10:25

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 09:56

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.745	0.655-0.886	24-169 %	47.1	%	
<i>13C12-2,3,7,8-TCDD</i>		0.751	0.655-0.886	25-164 %	67.6	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.568	1.318-1.783	24-185 %	66.5	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.524	1.318-1.783	21-178 %	68.3	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.610	1.318-1.783	25-181 %	76.0	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.502	0.434-0.587	26-152 %	73.7	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.493	0.434-0.587	26-123 %	73.4	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.532	0.434-0.587	28-136 %	77.6	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.509	0.434-0.587	29-147 %	85.3	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.253	1.054-1.426	32-141 %	77.4	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.231	1.054-1.426	28-130 %	72.7	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.443	0.374-0.506	28-143 %	63.8	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.452	0.374-0.506	26-138 %	68.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.057	0.893-1.208	23-140 %	84.0	%	
<i>13C12-OCDD</i>		0.921	0.757-1.024	17-157 %	90.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	78.9	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD72-0005**  
**22L0024-03 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 10:25  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-03  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	39.28	%	





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD72-1005**  
**22L0024-04 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 10:25  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 10:46

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 25.23 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-04 A 01 Dry Weight: 10.01 g % Solids: 39.68
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-04 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-04 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-04 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.730	0.655-0.886	0.11	1.00	<b>0.88</b>	ng/kg	J
2,3,7,8-TCDD		0.534	0.655-0.886	0.07	1.00	<b>0.45</b>	ng/kg	EMPC, J
1,2,3,7,8-PeCDF		1.581	1.318-1.783	0.09	1.00	<b>0.88</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.441	1.318-1.783	0.08	1.00	<b>0.74</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.469	1.318-1.783	0.14	1.00	<b>2.50</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.170	1.054-1.426	0.07	1.00	<b>3.44</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.317	1.054-1.426	0.07	1.00	<b>2.14</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.304	1.054-1.426	0.07	1.00	<b>3.10</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.498	1.054-1.426	0.09	1.00	<b>0.77</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.031	1.054-1.426	0.13	1.00	<b>2.06</b>	ng/kg	EMPC
1,2,3,6,7,8-HxCDD		1.176	1.054-1.426	0.13	1.00	<b>13.0</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.196	1.054-1.426	0.14	1.00	<b>7.13</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.968	0.893-1.208	0.09	1.00	<b>65.8</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		0.947	0.893-1.208	0.13	1.00	<b>2.08</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.038	0.893-1.208	0.24	2.50	<b>188</b>	ng/kg	
OCDF		0.873	0.757-1.024	0.17	2.50	<b>73.4</b>	ng/kg	
OCDD		0.856	0.757-1.024	0.37	9.99	<b>1320</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>7.18</b>	ng/kg	
Total TCDD					1.00	<b>7.85</b>	ng/kg	
Total PeCDF					1.00	<b>24.0</b>	ng/kg	
Total PeCDD					1.00	<b>13.5</b>	ng/kg	
Total HxCDF					1.00	<b>78.8</b>	ng/kg	
Total HxCDD					1.00	<b>117</b>	ng/kg	
Total HpCDF					1.00	<b>154</b>	ng/kg	
Total HpCDD					1.00	<b>428</b>	ng/kg	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD72-1005**  
**22L0024-04 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 10:25

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 10:46

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		9.43		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		9.43		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		9.06		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		8.69		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD72-1005**  
**22L0024-04 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 10:25

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 10:46

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.761	0.655-0.886	24-169 %	41.0	%	
<i>13C12-2,3,7,8-TCDD</i>		0.778	0.655-0.886	25-164 %	63.4	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.545	1.318-1.783	24-185 %	71.4	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.574	1.318-1.783	21-178 %	73.9	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.619	1.318-1.783	25-181 %	81.0	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.498	0.434-0.587	26-152 %	80.6	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.511	0.434-0.587	26-123 %	79.0	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.510	0.434-0.587	28-136 %	84.0	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.509	0.434-0.587	29-147 %	91.6	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.252	1.054-1.426	32-141 %	87.3	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.251	1.054-1.426	28-130 %	78.8	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.439	0.374-0.506	28-143 %	68.4	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.451	0.374-0.506	26-138 %	71.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.061	0.893-1.208	23-140 %	91.6	%	
<i>13C12-OCDD</i>		0.909	0.757-1.024	17-157 %	89.4	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	66.7	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD72-1005**  
**22L0024-04 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 10:25  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-04  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	39.68	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD73-0005**  
**22L0024-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 09:35  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 11:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 20.93 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-05 A 01 Dry Weight: 10.00 g % Solids: 47.77
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-05 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-05 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-05 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.821	0.655-0.886	0.06	1.00	<b>1.20</b>	ng/kg	X
2,3,7,8-TCDD		0.683	0.655-0.886	0.05	1.00	<b>0.42</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.604	1.318-1.783	0.10	1.00	<b>0.91</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.479	1.318-1.783	0.09	1.00	<b>0.84</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.925	1.318-1.783	0.14	1.00	<b>1.64</b>	ng/kg	EMPC
1,2,3,4,7,8-HxCDF		1.221	1.054-1.426	0.07	1.00	<b>2.22</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.363	1.054-1.426	0.07	1.00	<b>1.43</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.370	1.054-1.426	0.06	1.00	<b>2.00</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.050	1.054-1.426	0.08	1.00	<b>0.63</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.206	1.054-1.426	0.10	1.00	<b>1.43</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.211	1.054-1.426	0.10	1.00	<b>7.28</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.242	1.054-1.426	0.11	1.00	<b>4.24</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.955	0.893-1.208	0.08	1.00	<b>39.0</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.109	0.893-1.208	0.11	1.00	<b>1.37</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.004	0.893-1.208	0.18	2.50	<b>121</b>	ng/kg	
OCDF		0.872	0.757-1.024	0.13	2.50	<b>43.0</b>	ng/kg	
OCDD		0.856	0.757-1.024	0.36	10.0	<b>819</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>11.9</b>	ng/kg	
Total TCDD					1.00	<b>17.2</b>	ng/kg	
Total PeCDF					1.00	<b>24.4</b>	ng/kg	
Total PeCDD					1.00	<b>11.1</b>	ng/kg	
Total HxCDF					1.00	<b>50.2</b>	ng/kg	
Total HxCDD					1.00	<b>70.0</b>	ng/kg	
Total HpCDF					1.00	<b>87.9</b>	ng/kg	
Total HpCDD					1.00	<b>279</b>	ng/kg	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD73-0005**  
**22L0024-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 09:35

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 11:35

Analysis by: Analytical Resources, LLC

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		6.25		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		6.25		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		5.40		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		4.55		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD73-0005**  
**22L0024-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 09:35

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 11:35

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.751	0.655-0.886	24-169 %	65.7	%	
<i>13C12-2,3,7,8-TCDD</i>		0.763	0.655-0.886	25-164 %	87.8	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.518	1.318-1.783	24-185 %	76.2	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.533	1.318-1.783	21-178 %	76.4	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.580	1.318-1.783	25-181 %	85.1	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.501	0.434-0.587	26-152 %	83.7	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.512	0.434-0.587	26-123 %	80.3	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.503	0.434-0.587	28-136 %	86.4	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.503	0.434-0.587	29-147 %	92.5	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.246	1.054-1.426	32-141 %	88.7	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.256	1.054-1.426	28-130 %	80.1	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.436	0.374-0.506	28-143 %	72.3	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.445	0.374-0.506	26-138 %	77.5	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.034	0.893-1.208	23-140 %	94.8	%	
<i>13C12-OCDD</i>		0.902	0.757-1.024	17-157 %	96.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	90.4	%	





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD73-0005**  
**22L0024-05 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 09:35  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-05  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	47.77	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD74-0005**  
**22L0024-06 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 11:15  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 12:25

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 24.85 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-06 A 01 Dry Weight: 10.00 g % Solids: 40.25
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-06 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-06 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-06 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.669	0.655-0.886	0.10	1.00	<b>0.73</b>	ng/kg	X, J
2,3,7,8-TCDD		0.717	0.655-0.886	0.06	1.00	<b>0.27</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.719	1.318-1.783	0.07	1.00	<b>0.59</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.644	1.318-1.783	0.07	1.00	<b>0.50</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.373	1.318-1.783	0.08	1.00	<b>1.78</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.366	1.054-1.426	0.06	1.00	<b>2.44</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.175	1.054-1.426	0.06	1.00	<b>1.61</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.238	1.054-1.426	0.06	1.00	<b>2.14</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.308	1.054-1.426	0.07	1.00	<b>0.81</b>	ng/kg	J
1,2,3,4,7,8-HxCDD		1.264	1.054-1.426	0.13	1.00	<b>1.72</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.297	1.054-1.426	0.12	1.00	<b>9.50</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.190	1.054-1.426	0.13	1.00	<b>5.32</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		1.010	0.893-1.208	0.07	1.00	<b>49.1</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		0.971	0.893-1.208	0.10	1.00	<b>1.59</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.051	0.893-1.208	0.22	2.50	<b>140</b>	ng/kg	
OCDF		0.874	0.757-1.024	0.11	2.50	<b>67.1</b>	ng/kg	
OCDD		0.847	0.757-1.024	0.23	10.0	<b>959</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>5.24</b>	ng/kg	
Total TCDD					1.00	<b>5.06</b>	ng/kg	
Total PeCDF					1.00	<b>15.5</b>	ng/kg	
Total PeCDD					1.00	<b>10.1</b>	ng/kg	
Total HxCDF					1.00	<b>59.0</b>	ng/kg	
Total HxCDD					1.00	<b>82.9</b>	ng/kg	
Total HpCDF					1.00	<b>119</b>	ng/kg	
Total HpCDD					1.00	<b>301</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD74-0005**  
**22L0024-06 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 11:15

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 12:25

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		6.86		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		6.86		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		6.86		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		6.86		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD74-0005**  
**22L0024-06 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 11:15

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 12:25

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.746	0.655-0.886	24-169 %	65.4	%	
<i>13C12-2,3,7,8-TCDD</i>		0.771	0.655-0.886	25-164 %	85.0	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.543	1.318-1.783	24-185 %	78.7	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.544	1.318-1.783	21-178 %	79.7	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.620	1.318-1.783	25-181 %	88.2	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.504	0.434-0.587	26-152 %	86.1	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.498	0.434-0.587	26-123 %	84.2	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.494	0.434-0.587	28-136 %	90.2	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.499	0.434-0.587	29-147 %	98.1	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.269	1.054-1.426	32-141 %	89.4	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.243	1.054-1.426	28-130 %	85.7	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.456	0.374-0.506	28-143 %	75.9	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.447	0.374-0.506	26-138 %	83.6	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.076	0.893-1.208	23-140 %	99.7	%	
<i>13C12-OCDD</i>		0.899	0.757-1.024	17-157 %	106	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	88.7	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD74-0005**  
**22L0024-06 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 11:15  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-06  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	40.25	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD75-0005**  
**22L0024-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/30/2022 11:45  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 13:14

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 24.29 g (wet) Final Volume: 20 uL	Extract ID: 22L0024-07 A 01 Dry Weight: 10.00 g % Solids: 41.18
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-07 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-07 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22L0024-07 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.867	0.655-0.886	0.04	1.00	<b>0.73</b>	ng/kg	X, J
2,3,7,8-TCDD		0.501	0.655-0.886	0.04	1.00	<b>0.35</b>	ng/kg	EMPC, J
1,2,3,7,8-PeCDF		1.470	1.318-1.783	0.10	1.00	<b>0.62</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.402	1.318-1.783	0.09	1.00	<b>0.64</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.651	1.318-1.783	0.10	1.00	<b>1.68</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.209	1.054-1.426	0.06	1.00	<b>2.20</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.291	1.054-1.426	0.06	1.00	<b>1.46</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.272	1.054-1.426	0.06	1.00	<b>1.96</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.643	1.054-1.426	0.07	1.00	<b>0.44</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.414	1.054-1.426	0.14	1.00	<b>1.33</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.206	1.054-1.426	0.14	1.00	<b>7.28</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.240	1.054-1.426	0.15	1.00	<b>4.08</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.998	0.893-1.208	0.08	1.00	<b>37.6</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.119	0.893-1.208	0.11	1.00	<b>1.49</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.001	0.893-1.208	0.17	2.50	<b>109</b>	ng/kg	
OCDF		0.893	0.757-1.024	0.10	2.50	<b>46.9</b>	ng/kg	
OCDD		0.847	0.757-1.024	0.20	10.0	<b>771</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>6.73</b>	ng/kg	
Total TCDD					1.00	<b>4.38</b>	ng/kg	
Total PeCDF					1.00	<b>16.2</b>	ng/kg	
Total PeCDD					1.00	<b>5.61</b>	ng/kg	
Total HxCDF					1.00	<b>47.6</b>	ng/kg	
Total HxCDD					1.00	<b>63.3</b>	ng/kg	
Total HpCDF					1.00	<b>88.9</b>	ng/kg	
Total HpCDD					1.00	<b>245</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD75-0005**  
**22L0024-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 11:45

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 13:14

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		5.91		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		5.91		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		5.72		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		5.52		





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**WB-SO-SD75-0005**  
**22L0024-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/30/2022 11:45

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 13:14

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.739	0.655-0.886	24-169 %	71.6	%	
<i>13C12-2,3,7,8-TCDD</i>		0.778	0.655-0.886	25-164 %	93.0	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.572	1.318-1.783	24-185 %	78.2	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.549	1.318-1.783	21-178 %	78.8	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.656	1.318-1.783	25-181 %	87.4	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.503	0.434-0.587	26-152 %	78.2	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.500	0.434-0.587	26-123 %	75.0	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.507	0.434-0.587	28-136 %	81.3	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.498	0.434-0.587	29-147 %	88.1	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.267	1.054-1.426	32-141 %	81.4	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.256	1.054-1.426	28-130 %	78.4	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.450	0.374-0.506	28-143 %	69.9	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.452	0.374-0.506	26-138 %	75.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.076	0.893-1.208	23-140 %	93.7	%	
<i>13C12-OCDD</i>		0.895	0.757-1.024	17-157 %	95.8	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	102	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
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**WB-SO-SD75-0005**  
**22L0024-07 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/30/2022 11:45  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22L0024-07  
Preparation Batch: BKL0061 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	41.18	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	Reported: 21-Dec-2022 15:57
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKL0146-BLK1)</b>					Prepared: 13-Dec-2022		Analyzed: 19-Dec-2022 20:38				
2,3,7,8-TCDF		0.655-0.886	0.08	1.00	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.10	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.18	1.00	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.17	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.18	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.14	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.15	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF	1.331	0.893-1.208		1.00	0.29	ng/kg					EMPC, J
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.11	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD	1.502	0.893-1.208		2.50	0.58	ng/kg					EMPC, J
OCDF	1.023	0.757-1.024		2.50	1.80	ng/kg					J
OCDD	0.774	0.757-1.024		10.0	4.61	ng/kg					J
<b>Homologue group</b>											
Total TCDF				1.00	ND	ng/kg					U
Total TCDD				1.00	ND	ng/kg					U
Total PeCDF				1.00	ND	ng/kg					U
Total PeCDD				1.00	ND	ng/kg					U
Total HxCDF				1.00	0.16	ng/kg					J
Total HxCDD				1.00	ND	ng/kg					U
Total HpCDF				1.00	ND	ng/kg					U
Total HpCDD				1.00	ND	ng/kg					U

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.23  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.01  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC=ND): 0.22  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0 EDL, EMPC=ND): 0.00



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Blank (BKL0146-BLK1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 20:38

Labeled compounds

13C12-2,3,7,8-TCDF	0.737	0.655-0.886			68.2					24-169 %	
13C12-2,3,7,8-TCDD	0.746	0.655-0.886			86.3					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.525	1.318-1.783			77.9					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.526	1.318-1.783			74.9					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			83.6					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.508	0.434-0.587			103					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.560	0.434-0.587			110					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.488	0.434-0.587			102					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.508	0.434-0.587			106					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.252	1.054-1.426			103					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.246	1.054-1.426			104					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.453	0.374-0.506			85.2					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.449	0.374-0.506			86.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	0.983	0.893-1.208			111					23-140 %	
13C12-OCDD	0.877	0.757-1.024			101					17-157 %	
37Cl4-2,3,7,8-TCDD					91.8					35-197 %	

**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

2,3,7,8-TCDF	0.754	0.655-0.886		1.00	19.1	ng/kg	95.5	75-158 %			
2,3,7,8-TCDD	0.831	0.655-0.886		1.00	21.7	ng/kg	109	67-158 %			
1,2,3,7,8-PeCDF	1.544	1.318-1.783		1.00	104	ng/kg	104	80-134 %			
2,3,4,7,8-PeCDF	1.556	1.318-1.783		1.00	101	ng/kg	101	68-160 %			
1,2,3,7,8-PeCDD	1.483	1.318-1.783		1.00	115	ng/kg	115	70-142 %			
1,2,3,4,7,8-HxCDF	1.245	1.054-1.426		1.00	111	ng/kg	111	72-134 %			
1,2,3,6,7,8-HxCDF	1.247	1.054-1.426		1.00	120	ng/kg	120	84-130 %			
2,3,4,6,7,8-HxCDF	1.281	1.054-1.426		1.00	110	ng/kg	110	70-156 %			
1,2,3,7,8,9-HxCDF	1.214	1.054-1.426		1.00	105	ng/kg	105	78-130 %			
1,2,3,4,7,8-HxCDD	1.230	1.054-1.426		1.00	118	ng/kg	118	70-164 %			
1,2,3,6,7,8-HxCDD	1.117	1.054-1.426		1.00	114	ng/kg	114	76-134 %			
1,2,3,7,8,9-HxCDD	1.239	1.054-1.426		1.00	112	ng/kg	112	64-162 %			
1,2,3,4,6,7,8-HpCDF	0.971	0.893-1.208		1.00	108	ng/kg	108	82-122 %			
1,2,3,4,7,8,9-HpCDF	0.981	0.893-1.208		1.00	105	ng/kg	105	78-138 %			
1,2,3,4,6,7,8-HpCDD	1.041	0.893-1.208		2.50	114	ng/kg	114	70-140 %			
OCDF	0.906	0.757-1.024		2.50	175	ng/kg	87.6	63-170 %			
OCDD	0.835	0.757-1.024		10.0	222	ng/kg	111	78-144 %			



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

Labeled compounds

13C12-2,3,7,8-TCDF	0.745	0.655-0.886			35.2				24-169 %		
13C12-2,3,7,8-TCDD	0.751	0.655-0.886			62.0				25-164 %		
13C12-1,2,3,7,8-PeCDF	1.532	1.318-1.783			73.8				24-185 %		
13C12-2,3,4,7,8-PeCDF	1.530	1.318-1.783			70.9				21-178 %		
13C12-1,2,3,7,8-PeCDD	1.603	1.318-1.783			80.6				25-181 %		
13C12-1,2,3,4,7,8-HxCDF	0.497	0.434-0.587			94.0				26-152 %		
13C12-1,2,3,6,7,8-HxCDF	0.510	0.434-0.587			97.1				26-123 %		
13C12-2,3,4,6,7,8-HxCDF	0.500	0.434-0.587			95.4				28-136 %		
13C12-1,2,3,7,8,9-HxCDF	0.497	0.434-0.587			104				29-147 %		
13C12-1,2,3,4,7,8-HxCDD	1.248	1.054-1.426			95.6				32-141 %		
13C12-1,2,3,6,7,8-HxCDD	1.225	1.054-1.426			96.9				28-130 %		
13C12-1,2,3,4,6,7,8-HpCDF	0.435	0.374-0.506			80.0				28-143 %		
13C12-1,2,3,4,7,8,9-HpCDF	0.446	0.374-0.506			84.4				26-138 %		
13C12-1,2,3,4,6,7,8-HpCDD	1.061	0.893-1.208			100				23-140 %		
13C12-OCDD	0.895	0.757-1.024			97.4				17-157 %		
37Cl4-2,3,7,8-TCDD					65.7				35-197 %		

**LCS Dup (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

2,3,7,8-TCDF	0.699	0.655-0.886		1.00	18.6	ng/kg	93.0	75-158 %	2.64	25	
2,3,7,8-TCDD	0.791	0.655-0.886		1.00	20.8	ng/kg	104	67-158 %	4.29	25	
1,2,3,7,8-PeCDF	1.479	1.318-1.783		1.00	101	ng/kg	101	80-134 %	3.04	25	
2,3,4,7,8-PeCDF	1.536	1.318-1.783		1.00	102	ng/kg	102	68-160 %	0.13	25	
1,2,3,7,8-PeCDD	1.493	1.318-1.783		1.00	113	ng/kg	113	70-142 %	1.47	25	
1,2,3,4,7,8-HxCDF	1.214	1.054-1.426		1.00	110	ng/kg	110	72-134 %	0.87	25	
1,2,3,6,7,8-HxCDF	1.226	1.054-1.426		1.00	113	ng/kg	113	84-130 %	5.92	25	
2,3,4,6,7,8-HxCDF	1.215	1.054-1.426		1.00	105	ng/kg	105	70-156 %	4.88	25	
1,2,3,7,8,9-HxCDF	1.200	1.054-1.426		1.00	107	ng/kg	107	78-130 %	1.90	25	
1,2,3,4,7,8-HxCDD	1.205	1.054-1.426		1.00	117	ng/kg	117	70-164 %	0.52	25	
1,2,3,6,7,8-HxCDD	1.212	1.054-1.426		1.00	109	ng/kg	109	76-134 %	5.04	25	
1,2,3,7,8,9-HxCDD	1.194	1.054-1.426		1.00	112	ng/kg	112	64-162 %	0.06	25	
1,2,3,4,6,7,8-HpCDF	0.979	0.893-1.208		1.00	109	ng/kg	109	82-122 %	1.26	25	
1,2,3,4,7,8,9-HpCDF	0.974	0.893-1.208		1.00	109	ng/kg	109	78-138 %	3.62	25	
1,2,3,4,6,7,8-HpCDD	1.032	0.893-1.208		2.50	103	ng/kg	103	70-140 %	10.00	25	
OCDF	0.897	0.757-1.024		2.50	182	ng/kg	91.1	63-170 %	3.86	25	
OCDD	0.906	0.757-1.024		10.0	217	ng/kg	108	78-144 %	2.50	25	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS Dup (BKL0146-BSD1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

Labeled compounds

13C12-2,3,7,8-TCDF	0.744	0.655-0.886			60.8					24-169 %	
13C12-2,3,7,8-TCDD	0.762	0.655-0.886			81.8					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.552	1.318-1.783			77.3					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.560	1.318-1.783			73.3					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			84.4					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.500	0.434-0.587			91.3					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.500	0.434-0.587			94.4					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.495	0.434-0.587			92.9					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.513	0.434-0.587			97.9					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.255	1.054-1.426			93.1					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.260	1.054-1.426			93.9					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.449	0.374-0.506			78.0					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.443	0.374-0.506			81.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1.031	0.893-1.208			102					23-140 %	
13C12-OCDD	0.938	0.757-1.024			98.7					17-157 %	
37Cl4-2,3,7,8-TCDD					82.5					35-197 %	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8290A in Solid</b>	
2,3,7,8-TCDF	DoD-ELAP,NELAP,WADOE
2,3,7,8-TCDD	NELAP,WADOE
1,2,3,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
2,3,4,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP,WADOE
OCDF	DoD-ELAP,NELAP,WADOE
OCDD	DoD-ELAP,NELAP,WADOE
Total TCDF	DoD-ELAP,NELAP,WADOE
Total TCDD	DoD-ELAP,NELAP,WADOE
Total PeCDF	DoD-ELAP,NELAP,WADOE
Total PeCDD	DoD-ELAP,NELAP,WADOE
Total HxCDF	DoD-ELAP,NELAP,WADOE
Total HxCDD	DoD-ELAP,NELAP,WADOE
Total HpCDF	DoD-ELAP,NELAP,WADOE
Total HpCDD	DoD-ELAP,NELAP,WADOE
13C12-2,3,7,8-TCDF	DoD-ELAP,NELAP
13C12-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDF	DoD-ELAP,NELAP
13C12-2,3,4,7,8-PeCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K124-Solid Wood Inc Project Manager: Emily Bushlen	<b>Reported:</b> 21-Dec-2022 15:57
--	--	---------------------------------------

13C12-1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP
13C12-OCDD	DoD-ELAP,NELAP
37Cl4-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,4-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K124-Solid Wood Inc  
Project Manager: Emily Bushlen

**Reported:**  
21-Dec-2022 15:57

### Notes and Definitions

- \* Flagged value is not within established control limits.
- EMPC Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- X Indicates possible CDPE interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - Fax (208) 8829246 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

**Client:** Libby Environmental, Inc.  
**Address:** 3322 South Bay Rd. NE  
Olympia, WA 98506  
**Attn:** Sherry Chilcutt

**Work Order:** WCL0086  
**Project:** Solid Wood Inc  
**Reported:** 1/4/2023 14:18

## Analytical Results Report

**Sample Location:** WB-SO-SD70-0005  
**Lab/Sample Number:** WCL0086-01      **Collect Date:** 11/30/22 08:30  
**Date Received:** 12/02/22 13:39      **Collected By:**  
**Matrix:** Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	5.69	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	

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## Analytical Results Report

(Continued)

Sample Location: WB-SO-SD71-0005  
Lab/Sample Number: WCL0086-02      Collect Date: 11/30/22 09:05  
Date Received: 12/02/22 13:39      Collected By:  
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	10.5	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	

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## Analytical Results Report

(Continued)

Sample Location: WB-SO-SD72-0005  
Lab/Sample Number: WCL0086-03      Collect Date: 11/30/22 10:25  
Date Received: 12/02/22 13:39      Collected By:  
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	10.7	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	

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## Analytical Results Report

(Continued)

Sample Location: WB-SO-SD72-1005  
Lab/Sample Number: WCL0086-04      Collect Date: 11/30/22 10:25  
Date Received: 12/02/22 13:39      Collected By:  
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	11.5	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - Fax (208) 8829246 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

## Analytical Results Report

(Continued)

Sample Location: WB-SO-SD73-0005  
Lab/Sample Number: WCL0086-05      Collect Date: 11/30/22 09:35  
Date Received: 12/02/22 13:39      Collected By:  
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	8.29	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	



# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - Fax (208) 8829246 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

## Analytical Results Report

(Continued)

Sample Location: WB-SO-SD74-0005  
Lab/Sample Number: WCL0086-06      Collect Date: 11/30/22 11:15  
Date Received: 12/02/22 13:39      Collected By:  
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	10.8	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	

# Anatek Labs, Inc.

1282 Alturas Drive - Moscow, ID 83843 - (208) 883-2839 - Fax (208) 8829246 - email moscow@anateklabs.com  
504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

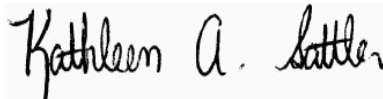
## Analytical Results Report

(Continued)

Sample Location: WB-SO-SD75-0005  
Lab/Sample Number: WCL0086-07 Collect Date: 11/30/22 11:45  
Date Received: 12/02/22 13:39 Collected By:  
Matrix: Solid

Analyte	Result	Units	PQL	Analyzed	Analyst	Method	Qualifier
<b>Inorganics</b>							
TVS	10.4	%	0.0100	12/12/22 9:39	EMG	SM 2540 G	

Authorized Signature,



Kathleen Sattler, Laboratory Manager

PQL Practical Quantitation Limit  
ND Not Detected  
MCL EPA's Maximum Contaminant Level  
Dry Sample results reported on a dry weight basis  
\* Not a state-certified analyte

This report shall not be reproduced except in full, without the written approval of the laboratory  
The results reported related only to the samples indicated.

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504 E Sprague Ste. D - Spokane, WA 99202 - (509) 838-3999 - fax (509) 838-4433 - email spokane@anateklabs.com

## Quality Control Data

### Inorganics

Analyte	Result	Qual	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
<b>Batch: BCL0174 - W Solids</b>										
<b>Duplicate (BCL0174-DUP1)</b>										
TVS	5.61		0.0100	%		5.69			1.55	200



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

WCL0086



Due 12/16/22

### Sending Laboratory:

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

### Subcontracted Laboratory:

Anatek Labs, Inc.  
504 E Sprague Ave # D  
Spokane, WA 99202  
Phone: (509) 838-3999  
Fax:

Requested Turnaround (TAT) Std

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

**Client Sample ID: WB-SO-SD70-0005** Soil Sampled: 11/30/2022 08:30 Lab ID: L22K124-01

TVS

Containers Supplied:

**Client Sample ID: WB-SO-SD71-0005** Soil Sampled: 11/30/2022 09:05 Lab ID: L22K124-02

TVS

Containers Supplied:

**Client Sample ID: WB-SO-SD72-0005** Soil Sampled: 11/30/2022 10:25 Lab ID: L22K124-03

TVS

Containers Supplied:

**Client Sample ID: WB-SO-SD72-1005** Soil Sampled: 11/30/2022 10:25 Lab ID: L22K124-04

TVS

Containers Supplied:

**Client Sample ID: WB-SO-SD73-0005** Soil Sampled: 11/30/2022 09:35 Lab ID: L22K124-05

TVS

Containers Supplied:

**Client Sample ID: WB-SO-SD74-0005** Soil Sampled: 11/30/2022 11:15 Lab ID: L22K124-06

TVS

Containers Supplied:

Released By [Signature] Date 11/30/22  
[Signature] 11.30.22

Received By [Signature] Date 12/2/22  
13.34



# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

WCL0086



Due: 12/16/22

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

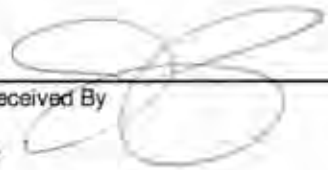
**Client Sample ID:** WB-SO-SD75-0005 *Soil Sampled: 11/30/2022 11:45*

Lab ID: L22K124-07

TVS

*Containers Supplied:*

  
 Released By \_\_\_\_\_ Date 11/30/22

  
 Received By \_\_\_\_\_ Date 12/2/22  
 13:49



**Analytical Resources, LLC**  
Analytical Chemists and Consultants

20 December 2022

Sherry Chilcutt  
Libby Environmental  
3322 South Bay Road NE  
Olympia, WA 98506

RE: Dioxin/Furans 2022-2023 (L22K119- Solid Wood Inc.)

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

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

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

Associated Work Order(s)  
22K0553

Associated SDG ID(s)  
N/A

**Shelly Fishel** Digitally signed by Shelly Fishel  
Date: 2022.12.20 19:13:44 -08'00'

-----

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

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

Analytical Resources, LLC

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

Shelly Fishel, Project Manager





721K-553  
**Libby Environmental, Inc.**

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K119**

**Sending Laboratory:**

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154  
  
Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

**Subcontracted Laboratory:**

Analytical Resources, Inc.  
4611 South 134th Place  
Seattle, WA 98109  
Phone: (206) 695-6210  
Fax:  
  
**Requested Turnaround (TAT)** 5td

**Project:** Solid Wood Inc.

Analysis	Comments
----------	----------

<b>Client Sample ID: WB-SO-SD60-0005</b>	<b>Soil Sampled: 11/28/2022 11:45</b>	Lab ID: L22K119-06
Dioxins / Furans		
Report all isomers and congeners		
<i>Containers Supplied:</i>		

<b>Client Sample ID: WB-SO-SD60-0020</b>	<b>Soil Sampled: 11/28/2022 12:10</b>	Lab ID: L22K119-07
Dioxins / Furans		
HOLD		
<i>Containers Supplied:</i>		

<b>Client Sample ID: WB-SO-SD61-0005</b>	<b>Soil Sampled: 11/28/2022 12:42</b>	Lab ID: L22K119-08
Dioxins / Furans		
Report all isomers and congeners		
<i>Containers Supplied:</i>		

<b>Client Sample ID: WB-SO-SD61-0020</b>	<b>Soil Sampled: 11/28/2022 13:10</b>	Lab ID: L22K119-09
Dioxins / Furans		
HOLD		
<i>Containers Supplied:</i>		

<b>Client Sample ID: WB-SO-SD62-0005</b>	<b>Soil Sampled: 11/28/2022 13:40</b>	Lab ID: L22K119-10
Dioxins / Furans		
Report all isomers and congeners		
<i>Containers Supplied:</i>		

<b>Client Sample ID: WB-SO-SD62-0020</b>	<b>Soil Sampled: 11/28/2022 14:05</b>	Lab ID: L22K119-11
Dioxins / Furans		
HOLD		
<i>Containers Supplied:</i>		

Released By: Bobie Christensen Date: 11/30/22
 Received By: Phillip RA AR Date: 11/30/22  
Janeth Anderson 11.29.22







Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WB-SO-SD60-0005	22K0553-01	Solid	28-Nov-2022 11:45	30-Nov-2022 13:05
WB-SO-SD61-0005	22K0553-03	Solid	28-Nov-2022 12:42	30-Nov-2022 13:05
WB-SO-SD62-0005	22K0553-05	Solid	28-Nov-2022 13:40	30-Nov-2022 13:05
WB-SO-SD63-0005	22K0553-07	Solid	28-Nov-2022 14:30	30-Nov-2022 13:05



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

## Work Order Case Narrative

**Client:** Libby Environmental  
**Project:** Dioxin/Furans 2022-2023  
**Project Number:** L22K119- Solid Wood Inc.  
**Work Order:** 22K0553

### Sample receipt

Sample(s) as listed on the preceding page were received 30-Nov-2022 13:05 under ARI work order 22K0553. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### Dioxin/Furans - EPA Method 8290

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column recently developed by Restek. The RTX-Dioxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

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

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.



# Cooler Receipt Form

ARI Client: Libby

Project Name: L22K119

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

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

Assigned ARI Job No: 22-ROSE3

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

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES (NO)

Were custody papers included with the cooler? YES (NO)

Were custody papers properly filled out (ink, signed, etc.)? YES (NO)

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

Time 13:05 4:8

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 7009708

Cooler Accepted by: PIB Date: 11/30/22 Time: 13:05

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES (NO)

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: Cap 1 box

Was sufficient ice used (if appropriate)? NA YES (NO)

How were bottles sealed in plastic bags? Individually Grouped (No)

Did all bottles arrive in good condition (unbroken)? YES (NO)

Were all bottle labels complete and legible? YES (NO)

Did the number of containers listed on COC match with the number of containers received? YES (NO)

Did all bottle labels and tags agree with custody papers? YES (NO)

Were all bottles used correct for the requested analyses? YES (NO)

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ... (NA) YES (NO)

Were all VOC vials free of air bubbles? (NA) YES (NO)

Was sufficient amount of sample sent in each bottle? YES (NO)

Date VOC Trip Blank was made at ARI: (NA)

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

Samples Logged by: [Signature] Date: 11/30/22 Time: \_\_\_\_\_ Labels checked by: PIB

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

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

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
--	--	---------------------------------------

**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 11:45  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 00:46

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 16.13 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-01 A 01 Dry Weight: 10.01 g % Solids: 62.05
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-01 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleaned: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-01 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-01 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.726	0.655-0.886	0.11	1.00	<b>1.22</b>	ng/kg	
2,3,7,8-TCDD		0.718	0.655-0.886	0.12	1.00	<b>0.55</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.263	1.318-1.783	0.10	1.00	<b>0.88</b>	ng/kg	EMPC, J
2,3,4,7,8-PeCDF		1.780	1.318-1.783	0.10	1.00	<b>0.61</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.533	1.318-1.783	0.09	1.00	<b>1.19</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.216	1.054-1.426	0.05	1.00	<b>1.68</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.120	1.054-1.426	0.05	1.00	<b>1.17</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.241	1.054-1.426	0.05	1.00	<b>1.60</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.594	1.054-1.426	0.06	1.00	<b>0.71</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.216	1.054-1.426	0.15	1.00	<b>1.30</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.166	1.054-1.426	0.14	1.00	<b>6.60</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.268	1.054-1.426	0.15	1.00	<b>4.27</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.978	0.893-1.208	0.07	1.00	<b>29.0</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		0.696	0.893-1.208	0.10	1.00	<b>1.21</b>	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.004	0.893-1.208	0.24	2.50	<b>104</b>	ng/kg	
OCDF		0.890	0.757-1.024	0.12	2.50	<b>33.2</b>	ng/kg	
OCDD		0.859	0.757-1.024	0.25	9.99	<b>670</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>10.8</b>	ng/kg	
Total TCDD					1.00	<b>7.57</b>	ng/kg	
Total PeCDF					1.00	<b>14.1</b>	ng/kg	
Total PeCDD					1.00	<b>5.13</b>	ng/kg	
Total HxCDF					1.00	<b>36.5</b>	ng/kg	
Total HxCDD					1.00	<b>61.1</b>	ng/kg	
Total HpCDF					1.00	<b>66.8</b>	ng/kg	
Total HpCDD					1.00	<b>218</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 11:45

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 00:46

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		5.36		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		5.36		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		5.30		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		5.25		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 11:45

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 00:46

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.758	0.655-0.886	24-169 %	60.2	%	
<i>13C12-2,3,7,8-TCDD</i>		0.754	0.655-0.886	25-164 %	80.0	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.556	1.318-1.783	24-185 %	76.7	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.543	1.318-1.783	21-178 %	77.5	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.561	1.318-1.783	25-181 %	87.8	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.496	0.434-0.587	26-152 %	86.3	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.510	0.434-0.587	26-123 %	85.1	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.508	0.434-0.587	28-136 %	88.4	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.487	0.434-0.587	29-147 %	103	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.253	1.054-1.426	32-141 %	87.9	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.210	1.054-1.426	28-130 %	85.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.449	0.374-0.506	28-143 %	75.9	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.442	0.374-0.506	26-138 %	82.2	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.061	0.893-1.208	23-140 %	97.9	%	
<i>13C12-OCDD</i>		0.909	0.757-1.024	17-157 %	102	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	81.6	%	





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD60-0005**  
**22K0553-01 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 11:45  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-01  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	62.05	%	



Libby Environmental  
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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 12:42  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 01:35

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 17.41 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-03 A 01 Dry Weight: 10.01 g % Solids: 57.50
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-03 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-03 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-03 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.652	0.655-0.886	0.09	1.00	<b>1.62</b>	ng/kg	EMPC, X
2,3,7,8-TCDD		0.752	0.655-0.886	0.08	1.00	<b>0.28</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.997	1.318-1.783	0.10	1.00	<b>0.70</b>	ng/kg	EMPC, J
2,3,4,7,8-PeCDF		1.616	1.318-1.783	0.10	1.00	<b>0.83</b>	ng/kg	J
1,2,3,7,8-PeCDD		1.547	1.318-1.783	0.13	1.00	<b>1.69</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.341	1.054-1.426	0.06	1.00	<b>2.36</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.450	1.054-1.426	0.06	1.00	<b>1.28</b>	ng/kg	EMPC
2,3,4,6,7,8-HxCDF		1.222	1.054-1.426	0.06	1.00	<b>1.90</b>	ng/kg	
1,2,3,7,8,9-HxCDF			1.054-1.426	0.07	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD		1.265	1.054-1.426	0.11	1.00	<b>1.50</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.324	1.054-1.426	0.11	1.00	<b>6.36</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.294	1.054-1.426	0.12	1.00	<b>3.52</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.986	0.893-1.208	0.07	1.00	<b>32.9</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.272	0.893-1.208	0.10	1.00	<b>1.42</b>	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.048	0.893-1.208	0.16	2.50	<b>104</b>	ng/kg	
OCDF		0.882	0.757-1.024	0.10	2.50	<b>33.8</b>	ng/kg	
OCDD		0.863	0.757-1.024	0.32	9.99	<b>682</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>16.4</b>	ng/kg	
Total TCDD					1.00	<b>6.25</b>	ng/kg	
Total PeCDF					1.00	<b>20.6</b>	ng/kg	
Total PeCDD					1.00	<b>9.53</b>	ng/kg	
Total HxCDF					1.00	<b>42.6</b>	ng/kg	
Total HxCDD					1.00	<b>55.1</b>	ng/kg	
Total HpCDF					1.00	<b>72.8</b>	ng/kg	
Total HpCDD					1.00	<b>225</b>	ng/kg	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 12:42

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 01:35

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		5.70		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		5.69		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		5.53		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		5.37		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 12:42

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 01:35

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.758	0.655-0.886	24-169 %	66.2	%	
<i>13C12-2,3,7,8-TCDD</i>		0.763	0.655-0.886	25-164 %	87.8	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.557	1.318-1.783	24-185 %	77.7	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.577	1.318-1.783	21-178 %	79.5	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.600	1.318-1.783	25-181 %	86.6	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.490	0.434-0.587	26-152 %	86.1	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.497	0.434-0.587	26-123 %	85.2	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.500	0.434-0.587	28-136 %	88.5	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.505	0.434-0.587	29-147 %	95.4	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.266	1.054-1.426	32-141 %	90.6	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.249	1.054-1.426	28-130 %	82.8	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.432	0.374-0.506	28-143 %	73.7	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.444	0.374-0.506	26-138 %	77.9	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.069	0.893-1.208	23-140 %	95.6	%	
<i>13C12-OCDD</i>		0.895	0.757-1.024	17-157 %	96.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	87.9	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD61-0005**  
**22K0553-03 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 12:42  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-03  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	57.50	%	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 13:40  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 02:24

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 20.38 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-05 A 01 Dry Weight: 10.01 g % Solids: 49.12
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-05 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleared: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-05 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleared: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-05 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		0.697	0.655-0.886	0.06	1.00	<b>2.04</b>	ng/kg	X
2,3,7,8-TCDD		0.688	0.655-0.886	0.05	1.00	<b>0.58</b>	ng/kg	J
1,2,3,7,8-PeCDF		1.299	1.318-1.783	0.10	1.00	<b>1.43</b>	ng/kg	EMPC
2,3,4,7,8-PeCDF		1.739	1.318-1.783	0.09	1.00	<b>1.63</b>	ng/kg	
1,2,3,7,8-PeCDD		1.808	1.318-1.783	0.08	1.00	<b>2.55</b>	ng/kg	EMPC
1,2,3,4,7,8-HxCDF		1.090	1.054-1.426	0.08	1.00	<b>3.78</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.156	1.054-1.426	0.08	1.00	<b>2.54</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.230	1.054-1.426	0.08	1.00	<b>3.51</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.392	1.054-1.426	0.09	1.00	<b>0.85</b>	ng/kg	J
1,2,3,4,7,8-HxCDD		1.432	1.054-1.426	0.15	1.00	<b>2.18</b>	ng/kg	EMPC
1,2,3,6,7,8-HxCDD		1.317	1.054-1.426	0.15	1.00	<b>10.6</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.191	1.054-1.426	0.16	1.00	<b>5.43</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.989	0.893-1.208	0.07	1.00	<b>48.4</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		0.811	0.893-1.208	0.11	1.00	<b>1.63</b>	ng/kg	EMPC
1,2,3,4,6,7,8-HpCDD		1.058	0.893-1.208	0.27	2.50	<b>183</b>	ng/kg	
OCDF		0.926	0.757-1.024	0.14	2.50	<b>41.8</b>	ng/kg	
OCDD		0.852	0.757-1.024	0.30	9.99	<b>1480</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>41.8</b>	ng/kg	
Total TCDD					1.00	<b>10.9</b>	ng/kg	
Total PeCDF					1.00	<b>47.0</b>	ng/kg	
Total PeCDD					1.00	<b>16.8</b>	ng/kg	
Total HxCDF					1.00	<b>74.7</b>	ng/kg	
Total HxCDD					1.00	<b>88.7</b>	ng/kg	
Total HpCDF					1.00	<b>102</b>	ng/kg	
Total HpCDD					1.00	<b>404</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 13:40

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 02:24

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		9.54		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		9.54		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		8.13		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		6.71		





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Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 13:40

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 02:24

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.751	0.655-0.886	24-169 %	52.1	%	
<i>13C12-2,3,7,8-TCDD</i>		0.774	0.655-0.886	25-164 %	77.1	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.534	1.318-1.783	24-185 %	74.2	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.548	1.318-1.783	21-178 %	74.5	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.578	1.318-1.783	25-181 %	84.9	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.503	0.434-0.587	26-152 %	86.3	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.498	0.434-0.587	26-123 %	83.6	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.508	0.434-0.587	28-136 %	87.8	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.497	0.434-0.587	29-147 %	91.1	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.256	1.054-1.426	32-141 %	90.8	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.220	1.054-1.426	28-130 %	85.0	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.431	0.374-0.506	28-143 %	73.8	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.450	0.374-0.506	26-138 %	79.7	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.093	0.893-1.208	23-140 %	95.8	%	
<i>13C12-OCDD</i>		0.905	0.757-1.024	17-157 %	98.8	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	78.8	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD62-0005**  
**22K0553-05 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 13:40  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-05  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	49.12	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/28/2022 14:30  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/20/2022 03:14

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 25.9 g (wet) Final Volume: 20 uL	Extract ID: 22K0553-07 A 01 Dry Weight: 10.00 g % Solids: 38.61
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-07 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleaned: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-07 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0553-07 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF		1.068	0.655-0.886	0.14	1.00	<b>1.29</b>	ng/kg	EMPC, X
2,3,7,8-TCDD			0.655-0.886	0.11	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF		1.668	1.318-1.783	0.10	1.00	<b>0.77</b>	ng/kg	J
2,3,4,7,8-PeCDF		1.311	1.318-1.783	0.10	1.00	<b>0.82</b>	ng/kg	EMPC, J
1,2,3,7,8-PeCDD		1.610	1.318-1.783	0.13	1.00	<b>1.95</b>	ng/kg	
1,2,3,4,7,8-HxCDF		1.250	1.054-1.426	0.09	1.00	<b>2.75</b>	ng/kg	
1,2,3,6,7,8-HxCDF		1.319	1.054-1.426	0.09	1.00	<b>1.77</b>	ng/kg	
2,3,4,6,7,8-HxCDF		1.303	1.054-1.426	0.09	1.00	<b>2.52</b>	ng/kg	
1,2,3,7,8,9-HxCDF		1.049	1.054-1.426	0.10	1.00	<b>0.70</b>	ng/kg	EMPC, J
1,2,3,4,7,8-HxCDD		1.125	1.054-1.426	0.15	1.00	<b>1.76</b>	ng/kg	
1,2,3,6,7,8-HxCDD		1.233	1.054-1.426	0.14	1.00	<b>10.1</b>	ng/kg	
1,2,3,7,8,9-HxCDD		1.273	1.054-1.426	0.16	1.00	<b>5.26</b>	ng/kg	
1,2,3,4,6,7,8-HpCDF		0.990	0.893-1.208	0.10	1.00	<b>45.3</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF		1.057	0.893-1.208	0.15	1.00	<b>1.58</b>	ng/kg	
1,2,3,4,6,7,8-HpCDD		1.027	0.893-1.208	0.27	2.50	<b>161</b>	ng/kg	
OCDF		0.896	0.757-1.024	0.13	2.50	<b>48.9</b>	ng/kg	
OCDD		0.844	0.757-1.024	0.35	10.0	<b>1190</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>8.84</b>	ng/kg	
Total TCDD					1.00	<b>9.50</b>	ng/kg	
Total PeCDF					1.00	<b>22.4</b>	ng/kg	
Total PeCDD					1.00	<b>15.4</b>	ng/kg	
Total HxCDF					1.00	<b>62.2</b>	ng/kg	
Total HxCDD					1.00	<b>90.2</b>	ng/kg	
Total HpCDF					1.00	<b>107</b>	ng/kg	
Total HpCDD					1.00	<b>381</b>	ng/kg	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 14:30

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 03:14

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):					7.34		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):					7.28		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):					7.12		
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):					6.84		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/28/2022 14:30

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/20/2022 03:14

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.749	0.655-0.886	24-169 %	47.5	%	
<i>13C12-2,3,7,8-TCDD</i>		0.758	0.655-0.886	25-164 %	67.7	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.535	1.318-1.783	24-185 %	68.8	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.570	1.318-1.783	21-178 %	70.4	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.615	1.318-1.783	25-181 %	78.6	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.496	0.434-0.587	26-152 %	78.4	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.491	0.434-0.587	26-123 %	74.5	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.507	0.434-0.587	28-136 %	78.9	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.503	0.434-0.587	29-147 %	85.9	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.235	1.054-1.426	32-141 %	82.9	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.209	1.054-1.426	28-130 %	74.6	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.449	0.374-0.506	28-143 %	67.0	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.485	0.374-0.506	26-138 %	73.3	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.089	0.893-1.208	23-140 %	86.7	%	
<i>13C12-OCDD</i>		0.888	0.757-1.024	17-157 %	92.8	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	71.2	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**WB-SO-SD63-0005**  
**22K0553-07 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/28/2022 14:30  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0553-07  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	38.61	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKL0146-BLK1)</b>											
				Prepared: 13-Dec-2022		Analyzed: 19-Dec-2022 20:38					
2,3,7,8-TCDF		0.655-0.886	0.08	1.00	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.10	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.18	1.00	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.17	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.18	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.14	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.15	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF	1.331	0.893-1.208		1.00	0.29	ng/kg					EMPC, J
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.11	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD	1.502	0.893-1.208		2.50	0.58	ng/kg					EMPC, J
OCDF	1.023	0.757-1.024		2.50	1.80	ng/kg					J
OCDD	0.774	0.757-1.024		10.0	4.61	ng/kg					J
<b>Homologue group</b>											
Total TCDF				1.00	ND	ng/kg					U
Total TCDD				1.00	ND	ng/kg					U
Total PeCDF				1.00	ND	ng/kg					U
Total PeCDD				1.00	ND	ng/kg					U
Total HxCDF				1.00	0.16	ng/kg					J
Total HxCDD				1.00	ND	ng/kg					U
Total HpCDF				1.00	ND	ng/kg					U
Total HpCDD				1.00	ND	ng/kg					U

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.23  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.01  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC=ND): 0.22  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0 EDL, EMPC=ND): 0.00





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Blank (BKL0146-BLK1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 20:38

Labeled compounds

13C12-2,3,7,8-TCDF	0.737	0.655-0.886			68.2					24-169 %	
13C12-2,3,7,8-TCDD	0.746	0.655-0.886			86.3					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.525	1.318-1.783			77.9					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.526	1.318-1.783			74.9					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			83.6					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.508	0.434-0.587			103					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.560	0.434-0.587			110					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.488	0.434-0.587			102					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.508	0.434-0.587			106					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.252	1.054-1.426			103					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.246	1.054-1.426			104					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.453	0.374-0.506			85.2					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.449	0.374-0.506			86.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	0.983	0.893-1.208			111					23-140 %	
13C12-OCDD	0.877	0.757-1.024			101					17-157 %	
37Cl4-2,3,7,8-TCDD					91.8					35-197 %	

**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

2,3,7,8-TCDF	0.754	0.655-0.886		1.00	19.1	ng/kg	95.5	75-158 %			
2,3,7,8-TCDD	0.831	0.655-0.886		1.00	21.7	ng/kg	109	67-158 %			
1,2,3,7,8-PeCDF	1.544	1.318-1.783		1.00	104	ng/kg	104	80-134 %			
2,3,4,7,8-PeCDF	1.556	1.318-1.783		1.00	101	ng/kg	101	68-160 %			
1,2,3,7,8-PeCDD	1.483	1.318-1.783		1.00	115	ng/kg	115	70-142 %			
1,2,3,4,7,8-HxCDF	1.245	1.054-1.426		1.00	111	ng/kg	111	72-134 %			
1,2,3,6,7,8-HxCDF	1.247	1.054-1.426		1.00	120	ng/kg	120	84-130 %			
2,3,4,6,7,8-HxCDF	1.281	1.054-1.426		1.00	110	ng/kg	110	70-156 %			
1,2,3,7,8,9-HxCDF	1.214	1.054-1.426		1.00	105	ng/kg	105	78-130 %			
1,2,3,4,7,8-HxCDD	1.230	1.054-1.426		1.00	118	ng/kg	118	70-164 %			
1,2,3,6,7,8-HxCDD	1.117	1.054-1.426		1.00	114	ng/kg	114	76-134 %			
1,2,3,7,8,9-HxCDD	1.239	1.054-1.426		1.00	112	ng/kg	112	64-162 %			
1,2,3,4,6,7,8-HpCDF	0.971	0.893-1.208		1.00	108	ng/kg	108	82-122 %			
1,2,3,4,7,8,9-HpCDF	0.981	0.893-1.208		1.00	105	ng/kg	105	78-138 %			
1,2,3,4,6,7,8-HpCDD	1.041	0.893-1.208		2.50	114	ng/kg	114	70-140 %			
OCDF	0.906	0.757-1.024		2.50	175	ng/kg	87.6	63-170 %			
OCDD	0.835	0.757-1.024		10.0	222	ng/kg	111	78-144 %			



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

Labeled compounds

13C12-2,3,7,8-TCDF	0.745	0.655-0.886			35.2				24-169 %		
13C12-2,3,7,8-TCDD	0.751	0.655-0.886			62.0				25-164 %		
13C12-1,2,3,7,8-PeCDF	1.532	1.318-1.783			73.8				24-185 %		
13C12-2,3,4,7,8-PeCDF	1.530	1.318-1.783			70.9				21-178 %		
13C12-1,2,3,7,8-PeCDD	1.603	1.318-1.783			80.6				25-181 %		
13C12-1,2,3,4,7,8-HxCDF	0.497	0.434-0.587			94.0				26-152 %		
13C12-1,2,3,6,7,8-HxCDF	0.510	0.434-0.587			97.1				26-123 %		
13C12-2,3,4,6,7,8-HxCDF	0.500	0.434-0.587			95.4				28-136 %		
13C12-1,2,3,7,8,9-HxCDF	0.497	0.434-0.587			104				29-147 %		
13C12-1,2,3,4,7,8-HxCDD	1.248	1.054-1.426			95.6				32-141 %		
13C12-1,2,3,6,7,8-HxCDD	1.225	1.054-1.426			96.9				28-130 %		
13C12-1,2,3,4,6,7,8-HpCDF	0.435	0.374-0.506			80.0				28-143 %		
13C12-1,2,3,4,7,8,9-HpCDF	0.446	0.374-0.506			84.4				26-138 %		
13C12-1,2,3,4,6,7,8-HpCDD	1.061	0.893-1.208			100				23-140 %		
13C12-OCDD	0.895	0.757-1.024			97.4				17-157 %		
37Cl4-2,3,7,8-TCDD					65.7				35-197 %		

**LCS Dup (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

2,3,7,8-TCDF	0.699	0.655-0.886		1.00	18.6	ng/kg	93.0	75-158 %	2.64	25	
2,3,7,8-TCDD	0.791	0.655-0.886		1.00	20.8	ng/kg	104	67-158 %	4.29	25	
1,2,3,7,8-PeCDF	1.479	1.318-1.783		1.00	101	ng/kg	101	80-134 %	3.04	25	
2,3,4,7,8-PeCDF	1.536	1.318-1.783		1.00	102	ng/kg	102	68-160 %	0.13	25	
1,2,3,7,8-PeCDD	1.493	1.318-1.783		1.00	113	ng/kg	113	70-142 %	1.47	25	
1,2,3,4,7,8-HxCDF	1.214	1.054-1.426		1.00	110	ng/kg	110	72-134 %	0.87	25	
1,2,3,6,7,8-HxCDF	1.226	1.054-1.426		1.00	113	ng/kg	113	84-130 %	5.92	25	
2,3,4,6,7,8-HxCDF	1.215	1.054-1.426		1.00	105	ng/kg	105	70-156 %	4.88	25	
1,2,3,7,8,9-HxCDF	1.200	1.054-1.426		1.00	107	ng/kg	107	78-130 %	1.90	25	
1,2,3,4,7,8-HxCDD	1.205	1.054-1.426		1.00	117	ng/kg	117	70-164 %	0.52	25	
1,2,3,6,7,8-HxCDD	1.212	1.054-1.426		1.00	109	ng/kg	109	76-134 %	5.04	25	
1,2,3,7,8,9-HxCDD	1.194	1.054-1.426		1.00	112	ng/kg	112	64-162 %	0.06	25	
1,2,3,4,6,7,8-HpCDF	0.979	0.893-1.208		1.00	109	ng/kg	109	82-122 %	1.26	25	
1,2,3,4,7,8,9-HpCDF	0.974	0.893-1.208		1.00	109	ng/kg	109	78-138 %	3.62	25	
1,2,3,4,6,7,8-HpCDD	1.032	0.893-1.208		2.50	103	ng/kg	103	70-140 %	10.00	25	
OCDF	0.897	0.757-1.024		2.50	182	ng/kg	91.1	63-170 %	3.86	25	
OCDD	0.906	0.757-1.024		10.0	217	ng/kg	108	78-144 %	2.50	25	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K119- Solid Wood Inc. Project Manager: Sherry Chilcutt	<b>Reported:</b> 20-Dec-2022 19:08
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS Dup (BKL0146-BSD1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

Labeled compounds											
13C12-2,3,7,8-TCDF	0.744	0.655-0.886			60.8					24-169 %	
13C12-2,3,7,8-TCDD	0.762	0.655-0.886			81.8					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.552	1.318-1.783			77.3					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.560	1.318-1.783			73.3					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			84.4					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.500	0.434-0.587			91.3					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.500	0.434-0.587			94.4					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.495	0.434-0.587			92.9					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.513	0.434-0.587			97.9					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.255	1.054-1.426			93.1					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.260	1.054-1.426			93.9					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.449	0.374-0.506			78.0					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.443	0.374-0.506			81.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1.031	0.893-1.208			102					23-140 %	
13C12-OCDD	0.938	0.757-1.024			98.7					17-157 %	
37Cl4-2,3,7,8-TCDD					82.5					35-197 %	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8290A in Solid</b>	
2,3,7,8-TCDF	DoD-ELAP,NELAP,WADOE
2,3,7,8-TCDD	NELAP,WADOE
1,2,3,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
2,3,4,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP,WADOE
OCDF	DoD-ELAP,NELAP,WADOE
OCDD	DoD-ELAP,NELAP,WADOE
Total TCDF	DoD-ELAP,NELAP,WADOE
Total TCDD	DoD-ELAP,NELAP,WADOE
Total PeCDF	DoD-ELAP,NELAP,WADOE
Total PeCDD	DoD-ELAP,NELAP,WADOE
Total HxCDF	DoD-ELAP,NELAP,WADOE
Total HxCDD	DoD-ELAP,NELAP,WADOE
Total HpCDF	DoD-ELAP,NELAP,WADOE
Total HpCDD	DoD-ELAP,NELAP,WADOE
13C12-2,3,7,8-TCDF	DoD-ELAP,NELAP
13C12-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDF	DoD-ELAP,NELAP
13C12-2,3,4,7,8-PeCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP



Libby Environmental  
3322 South Bay Road NE  
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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

13C12-1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP
13C12-OCDD	DoD-ELAP,NELAP
37Cl4-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,4-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023



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Project: Dioxin/Furans 2022-2023  
Project Number: L22K119- Solid Wood Inc.  
Project Manager: Sherry Chilcutt

**Reported:**  
20-Dec-2022 19:08

### Notes and Definitions

- \* Flagged value is not within established control limits.
- EMPC Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- X Indicates possible CDPE interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.



**Analytical Resources, LLC**  
Analytical Chemists and Consultants

21 December 2022

Sherry Chilcutt  
Libby Environmental  
3322 South Bay Road NE  
Olympia, WA 98506

RE: Dioxin/Furans 2022-2023 (L22K122 - Solid Wood Inc)

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

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

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

Associated Work Order(s)  
22K0552

Associated SDG ID(s)  
N/A

**Shelly Fishel** Digitally signed by Shelly Fishel  
Date: 2022.12.21 14:52:13 -08'00'

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

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

Analytical Resources, LLC

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

Shelly Fishel, Project Manager







22K0552

# Libby Environmental, Inc.

3322 South Bay Road NE • Olympia, WA 98506-2957

**SUBCONTRACT  
ORDER  
L22K122**

**Sending Laboratory:**

Libby Environmental, Inc.  
3322 South Bay Road NE  
Olympia, WA 98506  
Phone: 360-352-2110  
Fax: 360-352-4154

Project Manager: Sherry Chilcutt  
LibbyEnv@gmail.com

**Subcontracted Laboratory:**

Analytical Resources, Inc.  
4611 South 134th Place  
Seattle, WA 98109  
Phone: (206) 695-6210  
Fax:

**Requested Turnaround (TAT)** Std

**Project:** Solid Wood Inc.

Analysis	Comments
<b>Client Sample ID: WB-SO-SD64-0005</b> <i>Soil Sampled: 11/29/2022 08:29</i> Lab ID: L22K122-01 Dioxins / Furans    Report all isomers and congeners <i>Containers Supplied:</i>	
<b>Client Sample ID: WB-SO-SD64-0020</b> <i>Soil Sampled: 11/29/2022 08:55</i> Lab ID: L22K122-02 Dioxins / Furans    HOLD <i>Containers Supplied:</i>	

Released By: Sherry Chilcutt    Date: 11/30/22    Received By: AR    Date: 11/30/22  
Sherry Chilcutt    11/29/22    Page 1 of 1    Page 2 of 16 22K0552 ARISample FINAL 21 Dec 2022 1450



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
WB-SO-SD64-0005	22K0552-01	Solid	29-Nov-2022 08:29	30-Nov-2022 13:05



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

## **Work Order Case Narrative**

**Client:** Libby Environmental  
**Project:** Dioxin/Furans 2022-2023  
**Project Number:** L22K122 - Solid Wood Inc  
**Work Order:** 22K0552

### **Revised Report - December 21, 2022**

This report was revised to remove data that was not requested from sample 22K0552-02 due to data entry error.

### **Sample receipt**

Sample(s) as listed on the preceding page were received 30-Nov-2022 13:05 under ARI work order 22K0552. For details regarding sample receipt, please refer to the Cooler Receipt Form.

### **Dioxin/Furans - EPA Method 8290**

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column recently developed by Restek. The RTX-Dioxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

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

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.





# Cooler Receipt Form

ARI Client: Libby  
 COC No(s): \_\_\_\_\_ (NA)  
 Assigned ARI Job No: 22K0552

Project Name: L22K122  
 Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_  
 Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the cooler? YES  NO

Were custody papers included with the cooler? YES  NO

Were custody papers properly filled out (ink, signed, etc.)? YES  NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.8

Time 13:05

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: 5009708

Cooler Accepted by: PIB Date: 11/30/22 Time: 13:05

**Complete custody forms and attach all shipping documents**

**Log-In Phase:**

Was a temperature blank included in the cooler? YES  NO

What kind of packing material was used? Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: Ice & Baggies

Was sufficient ice used (if appropriate)? NA  YES  NO

How were bottles sealed in plastic bags? Individually  Grouped  Not

Did all bottles arrive in good condition (unbroken)? YES  NO

Were all bottle labels complete and legible? YES  NO

Did the number of containers listed on COC match with the number of containers received? YES  NO

Did all bottle labels and tags agree with custody papers? YES  NO

Were all bottles used correct for the requested analyses? YES  NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) NA  YES  NO

Were all VOC vials free of air bubbles? NA  YES  NO

Was sufficient amount of sample sent in each bottle? YES  NO

Date VOC Trip Blank was made at ARI: \_\_\_\_\_

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

Samples Logged by: PIB Date: 11/30/22 Time: 1458 Labels checked by: \_\_\_\_\_

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

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

**Additional Notes, Discrepancies, & Resolutions:**

By: \_\_\_\_\_ Date: \_\_\_\_\_



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	<b>Reported:</b> 21-Dec-2022 14:50
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**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A Sampled: 11/29/2022 08:29  
Instrument: AUTOSPEC01 Analyst: pk Analyzed: 12/19/2022 23:06

**Analysis by: Analytical Resources, LLC**

Sample Preparation:	Preparation Method: EPA 8290 Preparation Batch: BKL0146 Prepared: 12/13/2022	Sample Size: 13.82 g (wet) Final Volume: 20 uL	Extract ID: 22K0552-01 A 01 Dry Weight: 10.02 g % Solids: 72.48
Sample Cleanup:	Cleanup Method: Silica Gel Cleanup Batch: CKL0188 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0552-01 A 01
Sample Cleanup:	Cleanup Method: Sulfuric Acid Cleanup Batch: CKL0187 Cleaned: 14-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0552-01 A 01
Sample Cleanup:	Cleanup Method: Florisil Cleanup Batch: CKL0189 Cleaned: 15-Dec-2022	Initial Volume: 20 uL Final Volume: 20 uL	Extract ID: 22K0552-01 A 01

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting		Result	Units	Notes
				EDL	Limit			
2,3,7,8-TCDF			0.655-0.886	0.47	1.00	ND	ng/kg	U
2,3,7,8-TCDD			0.655-0.886	0.39	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDF		0.823	1.318-1.783	0.31	1.00	<b>0.64</b>	ng/kg	EMPC, J
2,3,4,7,8-PeCDF			1.318-1.783	0.29	1.00	ND	ng/kg	U
1,2,3,7,8-PeCDD			1.318-1.783	0.39	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDF			1.054-1.426	0.30	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDF			1.054-1.426	0.29	1.00	ND	ng/kg	U
2,3,4,6,7,8-HxCDF			1.054-1.426	0.29	1.00	ND	ng/kg	U
1,2,3,7,8,9-HxCDF			1.054-1.426	0.34	1.00	ND	ng/kg	U
1,2,3,4,7,8-HxCDD			1.054-1.426	0.33	1.00	ND	ng/kg	U
1,2,3,6,7,8-HxCDD		0.958	1.054-1.426	0.32	1.00	<b>1.87</b>	ng/kg	EMPC
1,2,3,7,8,9-HxCDD			1.054-1.426	0.35	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDF		1.061	0.893-1.208	0.32	1.00	<b>9.93</b>	ng/kg	
1,2,3,4,7,8,9-HpCDF			0.893-1.208	0.46	1.00	ND	ng/kg	U
1,2,3,4,6,7,8-HpCDD		1.053	0.893-1.208	0.42	2.50	<b>32.1</b>	ng/kg	
OCDF		0.937	0.757-1.024	0.66	2.50	<b>12.2</b>	ng/kg	
OCDD		0.863	0.757-1.024	0.82	9.98	<b>228</b>	ng/kg	
<b>Homologue groups</b>								
Total TCDF					1.00	<b>1.44</b>	ng/kg	
Total TCDD					1.00	ND	ng/kg	U
Total PeCDF					1.00	<b>4.38</b>	ng/kg	
Total PeCDD					1.00	ND	ng/kg	U
Total HxCDF					1.00	<b>10.3</b>	ng/kg	
Total HxCDD					1.00	<b>7.61</b>	ng/kg	
Total HpCDF					1.00	<b>21.9</b>	ng/kg	
Total HpCDD					1.00	<b>79.8</b>	ng/kg	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/29/2022 08:29

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/19/2022 23:06

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC):		1.25		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC):		0.70		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC = ND):		1.15		
			Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, EMPC = ND):		0.49		



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Dioxins/Furans**

Method: EPA 8290A

Sampled: 11/29/2022 08:29

Instrument: AUTOSPEC01 Analyst: pk

Analyzed: 12/19/2022 23:06

**Analysis by: Analytical Resources, LLC**

Analyte	DF/Split	Ion Ratio	Ratio Limits	Reporting Limit	Result	Units	Notes
<b>Labeled compounds</b>							
<i>13C12-2,3,7,8-TCDF</i>		0.734	0.655-0.886	24-169 %	42.5	%	
<i>13C12-2,3,7,8-TCDD</i>		0.779	0.655-0.886	25-164 %	59.6	%	
<i>13C12-1,2,3,7,8-PeCDF</i>		1.556	1.318-1.783	24-185 %	68.2	%	
<i>13C12-2,3,4,7,8-PeCDF</i>		1.560	1.318-1.783	21-178 %	69.9	%	
<i>13C12-1,2,3,7,8-PeCDD</i>		1.619	1.318-1.783	25-181 %	77.2	%	
<i>13C12-1,2,3,4,7,8-HxCDF</i>		0.498	0.434-0.587	26-152 %	85.2	%	
<i>13C12-1,2,3,6,7,8-HxCDF</i>		0.484	0.434-0.587	26-123 %	84.1	%	
<i>13C12-2,3,4,6,7,8-HxCDF</i>		0.482	0.434-0.587	28-136 %	87.9	%	
<i>13C12-1,2,3,7,8,9-HxCDF</i>		0.521	0.434-0.587	29-147 %	101	%	
<i>13C12-1,2,3,4,7,8-HxCDD</i>		1.266	1.054-1.426	32-141 %	87.7	%	
<i>13C12-1,2,3,6,7,8-HxCDD</i>		1.217	1.054-1.426	28-130 %	83.1	%	
<i>13C12-1,2,3,4,6,7,8-HpCDF</i>		0.454	0.374-0.506	28-143 %	75.5	%	
<i>13C12-1,2,3,4,7,8,9-HpCDF</i>		0.453	0.374-0.506	26-138 %	80.8	%	
<i>13C12-1,2,3,4,6,7,8-HpCDD</i>		1.084	0.893-1.208	23-140 %	95.5	%	
<i>13C12-OCDD</i>		0.904	0.757-1.024	17-157 %	97.7	%	
<i>37Cl4-2,3,7,8-TCDD</i>				35-197 %	62.0	%	





Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	<b>Reported:</b> 21-Dec-2022 14:50
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**WB-SO-SD64-0005**  
**22K0552-01 (Solid)**

**Extractions**

Method: ASTM D2216 Sampled: 11/29/2022 08:29  
Instrument: N/A Analyst: TW Analyzed: 12/07/2022 06:30

**Analysis by: Analytical Resources, LLC**

Sample Preparation: Preparation Method: No Prep-Organics Extract ID: 22K0552-01  
Preparation Batch: BKL0002 Sample Size: 1 g (wet)  
Prepared: 12/06/2022 Final Volume: 1 g

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Total Solids		1	0.01	72.48	%	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	Reported: 21-Dec-2022 14:50
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BKL0146-BLK1)</b>					Prepared: 13-Dec-2022		Analyzed: 19-Dec-2022 20:38				
2,3,7,8-TCDF		0.655-0.886	0.08	1.00	ND	ng/kg					U
2,3,7,8-TCDD		0.655-0.886	0.10	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDF		1.318-1.783	0.18	1.00	ND	ng/kg					U
2,3,4,7,8-PeCDF		1.318-1.783	0.17	1.00	ND	ng/kg					U
1,2,3,7,8-PeCDD		1.318-1.783	0.18	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
2,3,4,6,7,8-HxCDF		1.054-1.426	0.10	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDF		1.054-1.426	0.14	1.00	ND	ng/kg					U
1,2,3,4,7,8-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,6,7,8-HxCDD		1.054-1.426	0.15	1.00	ND	ng/kg					U
1,2,3,7,8,9-HxCDD		1.054-1.426	0.16	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDF	1.331	0.893-1.208		1.00	0.29	ng/kg					EMPC, J
1,2,3,4,7,8,9-HpCDF		0.893-1.208	0.11	1.00	ND	ng/kg					U
1,2,3,4,6,7,8-HpCDD	1.502	0.893-1.208		2.50	0.58	ng/kg					EMPC, J
OCDF	1.023	0.757-1.024		2.50	1.80	ng/kg					J
OCDD	0.774	0.757-1.024		10.0	4.61	ng/kg					J
<b>Homologue group</b>											
Total TCDF				1.00	ND	ng/kg					U
Total TCDD				1.00	ND	ng/kg					U
Total PeCDF				1.00	ND	ng/kg					U
Total PeCDD				1.00	ND	ng/kg					U
Total HxCDF				1.00	0.16	ng/kg					J
Total HxCDD				1.00	ND	ng/kg					U
Total HpCDF				1.00	ND	ng/kg					U
Total HpCDD				1.00	ND	ng/kg					U

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.23  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.01  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, EMPC=ND): 0.22  
 Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0 EDL, EMPC=ND): 0.00



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Blank (BKL0146-BLK1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 20:38

Labeled compounds

13C12-2,3,7,8-TCDF	0.737	0.655-0.886			68.2					24-169 %	
13C12-2,3,7,8-TCDD	0.746	0.655-0.886			86.3					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.525	1.318-1.783			77.9					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.526	1.318-1.783			74.9					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			83.6					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.508	0.434-0.587			103					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.560	0.434-0.587			110					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.488	0.434-0.587			102					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.508	0.434-0.587			106					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.252	1.054-1.426			103					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.246	1.054-1.426			104					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.453	0.374-0.506			85.2					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.449	0.374-0.506			86.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	0.983	0.893-1.208			111					23-140 %	
13C12-OCDD	0.877	0.757-1.024			101					17-157 %	
37Cl4-2,3,7,8-TCDD					91.8					35-197 %	

**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

2,3,7,8-TCDF	0.754	0.655-0.886		1.00	19.1	ng/kg	95.5	75-158 %			
2,3,7,8-TCDD	0.831	0.655-0.886		1.00	21.7	ng/kg	109	67-158 %			
1,2,3,7,8-PeCDF	1.544	1.318-1.783		1.00	104	ng/kg	104	80-134 %			
2,3,4,7,8-PeCDF	1.556	1.318-1.783		1.00	101	ng/kg	101	68-160 %			
1,2,3,7,8-PeCDD	1.483	1.318-1.783		1.00	115	ng/kg	115	70-142 %			
1,2,3,4,7,8-HxCDF	1.245	1.054-1.426		1.00	111	ng/kg	111	72-134 %			
1,2,3,6,7,8-HxCDF	1.247	1.054-1.426		1.00	120	ng/kg	120	84-130 %			
2,3,4,6,7,8-HxCDF	1.281	1.054-1.426		1.00	110	ng/kg	110	70-156 %			
1,2,3,7,8,9-HxCDF	1.214	1.054-1.426		1.00	105	ng/kg	105	78-130 %			
1,2,3,4,7,8-HxCDD	1.230	1.054-1.426		1.00	118	ng/kg	118	70-164 %			
1,2,3,6,7,8-HxCDD	1.117	1.054-1.426		1.00	114	ng/kg	114	76-134 %			
1,2,3,7,8,9-HxCDD	1.239	1.054-1.426		1.00	112	ng/kg	112	64-162 %			
1,2,3,4,6,7,8-HpCDF	0.971	0.893-1.208		1.00	108	ng/kg	108	82-122 %			
1,2,3,4,7,8,9-HpCDF	0.981	0.893-1.208		1.00	105	ng/kg	105	78-138 %			
1,2,3,4,6,7,8-HpCDD	1.041	0.893-1.208		2.50	114	ng/kg	114	70-140 %			
OCDF	0.906	0.757-1.024		2.50	175	ng/kg	87.6	63-170 %			
OCDD	0.835	0.757-1.024		10.0	222	ng/kg	111	78-144 %			



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	Reporting EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 21:27

Labeled compounds

13C12-2,3,7,8-TCDF	0.745	0.655-0.886			35.2				24-169 %		
13C12-2,3,7,8-TCDD	0.751	0.655-0.886			62.0				25-164 %		
13C12-1,2,3,7,8-PeCDF	1.532	1.318-1.783			73.8				24-185 %		
13C12-2,3,4,7,8-PeCDF	1.530	1.318-1.783			70.9				21-178 %		
13C12-1,2,3,7,8-PeCDD	1.603	1.318-1.783			80.6				25-181 %		
13C12-1,2,3,4,7,8-HxCDF	0.497	0.434-0.587			94.0				26-152 %		
13C12-1,2,3,6,7,8-HxCDF	0.510	0.434-0.587			97.1				26-123 %		
13C12-2,3,4,6,7,8-HxCDF	0.500	0.434-0.587			95.4				28-136 %		
13C12-1,2,3,7,8,9-HxCDF	0.497	0.434-0.587			104				29-147 %		
13C12-1,2,3,4,7,8-HxCDD	1.248	1.054-1.426			95.6				32-141 %		
13C12-1,2,3,6,7,8-HxCDD	1.225	1.054-1.426			96.9				28-130 %		
13C12-1,2,3,4,6,7,8-HpCDF	0.435	0.374-0.506			80.0				28-143 %		
13C12-1,2,3,4,7,8,9-HpCDF	0.446	0.374-0.506			84.4				26-138 %		
13C12-1,2,3,4,6,7,8-HpCDD	1.061	0.893-1.208			100				23-140 %		
13C12-OCDD	0.895	0.757-1.024			97.4				17-157 %		
37Cl4-2,3,7,8-TCDD					65.7				35-197 %		

**LCS Dup (BKL0146-BS1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

2,3,7,8-TCDF	0.699	0.655-0.886		1.00	18.6	ng/kg	93.0	75-158 %	2.64	25	
2,3,7,8-TCDD	0.791	0.655-0.886		1.00	20.8	ng/kg	104	67-158 %	4.29	25	
1,2,3,7,8-PeCDF	1.479	1.318-1.783		1.00	101	ng/kg	101	80-134 %	3.04	25	
2,3,4,7,8-PeCDF	1.536	1.318-1.783		1.00	102	ng/kg	102	68-160 %	0.13	25	
1,2,3,7,8-PeCDD	1.493	1.318-1.783		1.00	113	ng/kg	113	70-142 %	1.47	25	
1,2,3,4,7,8-HxCDF	1.214	1.054-1.426		1.00	110	ng/kg	110	72-134 %	0.87	25	
1,2,3,6,7,8-HxCDF	1.226	1.054-1.426		1.00	113	ng/kg	113	84-130 %	5.92	25	
2,3,4,6,7,8-HxCDF	1.215	1.054-1.426		1.00	105	ng/kg	105	70-156 %	4.88	25	
1,2,3,7,8,9-HxCDF	1.200	1.054-1.426		1.00	107	ng/kg	107	78-130 %	1.90	25	
1,2,3,4,7,8-HxCDD	1.205	1.054-1.426		1.00	117	ng/kg	117	70-164 %	0.52	25	
1,2,3,6,7,8-HxCDD	1.212	1.054-1.426		1.00	109	ng/kg	109	76-134 %	5.04	25	
1,2,3,7,8,9-HxCDD	1.194	1.054-1.426		1.00	112	ng/kg	112	64-162 %	0.06	25	
1,2,3,4,6,7,8-HpCDF	0.979	0.893-1.208		1.00	109	ng/kg	109	82-122 %	1.26	25	
1,2,3,4,7,8,9-HpCDF	0.974	0.893-1.208		1.00	109	ng/kg	109	78-138 %	3.62	25	
1,2,3,4,6,7,8-HpCDD	1.032	0.893-1.208		2.50	103	ng/kg	103	70-140 %	10.00	25	
OCDF	0.897	0.757-1.024		2.50	182	ng/kg	91.1	63-170 %	3.86	25	
OCDD	0.906	0.757-1.024		10.0	217	ng/kg	108	78-144 %	2.50	25	



Libby Environmental 3322 South Bay Road NE Olympia WA, 98506	Project: Dioxin/Furans 2022-2023 Project Number: L22K122 - Solid Wood Inc Project Manager: Sherry Chilcutt	<b>Reported:</b> 21-Dec-2022 14:50
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**Analysis by: Analytical Resources, LLC**

**Dioxins/Furans - Quality Control**

**Batch BKL0146 - EPA 8290A**

Instrument: AUTOSPEC01 Analyst: pl

QC Sample/Analyte	Ion Ratio	Ratio Limits	EDL	Reporting Limit	Result	Units	%REC	%REC Limits	RPD	RPD Limit	Notes
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**LCS Dup (BKL0146-BSD1)**

Prepared: 13-Dec-2022 Analyzed: 19-Dec-2022 22:17

Labeled compounds											
13C12-2,3,7,8-TCDF	0.744	0.655-0.886			60.8					24-169 %	
13C12-2,3,7,8-TCDD	0.762	0.655-0.886			81.8					25-164 %	
13C12-1,2,3,7,8-PeCDF	1.552	1.318-1.783			77.3					24-185 %	
13C12-2,3,4,7,8-PeCDF	1.560	1.318-1.783			73.3					21-178 %	
13C12-1,2,3,7,8-PeCDD	1.595	1.318-1.783			84.4					25-181 %	
13C12-1,2,3,4,7,8-HxCDF	0.500	0.434-0.587			91.3					26-152 %	
13C12-1,2,3,6,7,8-HxCDF	0.500	0.434-0.587			94.4					26-123 %	
13C12-2,3,4,6,7,8-HxCDF	0.495	0.434-0.587			92.9					28-136 %	
13C12-1,2,3,7,8,9-HxCDF	0.513	0.434-0.587			97.9					29-147 %	
13C12-1,2,3,4,7,8-HxCDD	1.255	1.054-1.426			93.1					32-141 %	
13C12-1,2,3,6,7,8-HxCDD	1.260	1.054-1.426			93.9					28-130 %	
13C12-1,2,3,4,6,7,8-HpCDF	0.449	0.374-0.506			78.0					28-143 %	
13C12-1,2,3,4,7,8,9-HpCDF	0.443	0.374-0.506			81.7					26-138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1.031	0.893-1.208			102					23-140 %	
13C12-OCDD	0.938	0.757-1.024			98.7					17-157 %	
37Cl4-2,3,7,8-TCDD					82.5					35-197 %	



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8290A in Solid</b>	
2,3,7,8-TCDF	DoD-ELAP,NELAP,WADOE
2,3,7,8-TCDD	NELAP,WADOE
1,2,3,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
2,3,4,7,8-PeCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8-PeCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP,WADOE
1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP,WADOE
OCDF	DoD-ELAP,NELAP,WADOE
OCDD	DoD-ELAP,NELAP,WADOE
Total TCDF	DoD-ELAP,NELAP,WADOE
Total TCDD	DoD-ELAP,NELAP,WADOE
Total PeCDF	DoD-ELAP,NELAP,WADOE
Total PeCDD	DoD-ELAP,NELAP,WADOE
Total HxCDF	DoD-ELAP,NELAP,WADOE
Total HxCDD	DoD-ELAP,NELAP,WADOE
Total HpCDF	DoD-ELAP,NELAP,WADOE
Total HpCDD	DoD-ELAP,NELAP,WADOE
13C12-2,3,7,8-TCDF	DoD-ELAP,NELAP
13C12-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDF	DoD-ELAP,NELAP
13C12-2,3,4,7,8-PeCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8-PeCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-2,3,4,6,7,8-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8-HxCDD	DoD-ELAP,NELAP



Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

13C12-1,2,3,6,7,8-HxCDD	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,7,8,9-HpCDF	DoD-ELAP,NELAP
13C12-1,2,3,4,6,7,8-HpCDD	DoD-ELAP,NELAP
13C12-OCDD	DoD-ELAP,NELAP
37Cl4-2,3,7,8-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,4-TCDD	DoD-ELAP,NELAP
13C12-1,2,3,7,8,9-HxCDD	DoD-ELAP,NELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	03/28/2023
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/28/2023
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-012	05/12/2023
WADOE	WA Dept of Ecology	C558	06/30/2023
WA-DW	Ecology - Drinking Water	C558	06/30/2023





Libby Environmental  
3322 South Bay Road NE  
Olympia WA, 98506

Project: Dioxin/Furans 2022-2023  
Project Number: L22K122 - Solid Wood Inc  
Project Manager: Sherry Chilcutt

**Reported:**  
21-Dec-2022 14:50

### Notes and Definitions

- \* Flagged value is not within established control limits.
- EMPC Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
- J Estimated concentration value detected below the reporting limit.
- U This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- X Indicates possible CDPE interference.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference
- [2C] Indicates this result was quantified on the second column on a dual column analysis.

# **Attachment 3**

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double-sided printing.

# Photographic Log

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# Photographic Log

<p><b>Photo No. 1:</b> SD-69 (0.0 – 0.50 ft bgs)</p>	
<p><b>Date:</b> 11/28/2022</p>	
<p><b>Estimated Wood Debris Volume:</b> N/A</p>	
<p><b>Field Observations:</b> Sample collected at 0930. Depth of water = 13 ft. No odor. First top inch soft, loosely packed sandy material followed by dense silty material. Shell material present. No wood debris.</p>	

<p><b>Photo No. 2:</b> SD-68 (0.0 – 0.50 ft bgs)</p>	
<p><b>Date:</b> 11/28/2022</p>	
<p><b>Estimated Wood Debris Volume:</b> N/A</p>	
<p><b>Field Observations:</b> Sample collected at 0955. Depth of water = 12.9 ft. Very faint odor (rotten egg smell). Seaweed and small shells (&lt; 1 – 2 inches) present. Top layer of sandy material, followed by dense, silty sand. No wood debris.</p>	



# Photographic Log

**Photo No. 3:** SD-67  
(0.0 – 0.50 ft bgs)

**Date:** 11/28/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 1015. Depth of water = 13.2 ft. No odor. No shells or biological species present. Very fine-grained material, densely packed. Ran through #200 sieve. No wood debris.



**Photo No. 4:** SD-66  
(0.0 – 0.50 ft bgs)

**Date:** 11/28/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 1045. Depth of water = 12.7 ft. No odor. No shells or vegetation present. Very fine-grained, loosely packed material. Few large rocks present. No wood debris.



# Photographic Log

**Photo No. 5:** SD-65  
(0.0 – 0.50 ft bgs)

**Date:** 11/28/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
First grab collected at 1105. Depth of water = 11.5 ft. No odor. Grab rejected due to large rocks, shells, and vegetation. Barely any sediment present. No wood debris.

Moved approximately 5' north of original sample location. Sample collected at 1130. No odors. Shells present. No vegetation. Top layer of sandy material, followed by dense, silty sand. No wood debris.



**Photo No. 6:** SD-60  
(0.0 – 0.50 ft bgs)

**Date:** 11/28/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 1145. Depth of water = 7.8 ft. No odor. No shells or vegetation present. Dark, dense sandy material. No wood debris.






# Photographic Log

<p><b>Photo No. 7:</b> SD-60 (0.50 – 2.0 ft bgs)</p>	
<p><b>Date:</b> 11/28/2022</p>	
<p><b>Estimated Wood Debris Volume:</b> N/A</p>	
<p><b>Field Observations:</b>            First grab collected at 1210. Depth of water = 7.9 ft. Power grab hit side of boat when being pulled up, over 50% of the volume was lost. First grab rejected.             Second grab approximately 2' north of first grab. Sample collected at 1217. Depth of water = 7.8 ft. No odor. Blackish, dense silty sand material. Large volume of shells and rock material. No wood debris.</p>	

<p><b>Photo No. 8:</b> SD-61 (0.0 – 0.50 ft bgs)</p>	
<p><b>Date:</b> 11/28/2022</p>	
<p><b>Estimated Wood Debris Volume:</b> N/A</p>	
<p><b>Field Observations:</b>            Sample collected at 1242. Depth of water = 6.0 ft. No odor. Loose silty sand material. Shells present. No vegetation. No wood debris.</p>	

# Photographic Log

<p><b>Photo No. 9:</b> SD-61 (0.50 – 2.0 ft bgs)</p>	
<p><b>Date:</b> 11/29/2022</p>	
<p><b>Estimated Wood Debris Volume:</b> N/A</p>	
<p><b>Field Observations:</b>            First grab collected at 1310. Depth of water = 5.6 ft. Grab rejected. Small tree log/bark picked up by the power grab. Not enough sediment to sample.</p> <p>Sample collected at 1317. Depth of water = 6.4 ft. No odor. Blackish, dense sand. No shells present. Vegetation and rocks in sample. No wood debris.</p>	

<p><b>Photo No. 10:</b> SD-62 (0.0 – 0.50 ft bgs)</p>	
<p><b>Date:</b> 11/29/2022</p>	
<p><b>Estimated Wood Debris Volume:</b> N/A</p>	
<p><b>Field Observations:</b>            Sample collected at 1340. Depth of water = 5.4 ft. No odor. Top inch of soft sand material. Dense silty clay. No shells or vegetation present. No wood debris.</p>	



# Photographic Log

**Photo No. 11:** SD-62  
(0.50 – 2.0 ft bgs)

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 1405. Depth of water = 5.7 ft. No odor. Dense sand/clay. No shells or vegetation present. No wood debris.



**Photo No. 12:** SD-63  
(0.0 – 0.50 ft bgs)

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 1430. Depth of water = 5.6 ft. No odor on surface, odor below two inches (organic matter). Brown in color, black splotches throughout sample. Loose sand material. Plant roots present. Shells. No wood debris.



# Photographic Log

**Photo No. 13:** SD-63  
(0.50 – 2.0 ft bgs)

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 1445. Depth of water = 4.8 ft. Organic matter smell (rotten eggs). Loose, fine-grained material. No shells. Presence of log pieces/bark.



**Photo No. 14:** SD-64  
(0.0 – 0.50 ft bgs)

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected 0830. Depth of water = 7.5 ft. No odor. Blackish, dense silt material. Large rocks and shells. Presence of log pieces/bark.





# Photographic Log

**Photo No. 15:** SD-64  
(0.50 – 2.0 ft bgs)

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** N/A

**Field Observations:**  
Sample collected at 0855. Depth of water = 8.9 ft. No odor. Blackish, dense silt material. No rock or shell present. Presence of fine wood debris, centralized in a small portion of the sample.



**Photo No. 16:** Sieve No. 06

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** < 5%

**Field Observations:**  
Sample collected at 0923. Depth of water = 12.6 ft. No odor. 1 inch of loose, sandy material followed by dense silty/clay. High volume of shells present. One larger piece of wood debris. High volume of organic matter/vegetation, not necessarily associated with wood debris.





# Photographic Log

**Photo No. 17:** Sieve No. 02

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** ~10%

**Field Observations:**  
 Sample collected at 0938. Depth of water = 12.1 ft. No odor. Dense, fine silty-clay material. Very fine wood debris, mixed with shells and other organic matter.

**Sample SD70**  
 collected on  
 11/30/2022 at 0830.



**Photo No. 18:** Sieve No. 04

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 10 – 12%

**Field Observations:**  
 Sample collected at 1000. Depth of water = 12.2 ft. Very faint odor (rotten egg smell). Dense fine silty-clay material. Very fine wood debris, mixed with shells and other organic matter.

**Sample SD71**  
 collected on  
 11/30/2022 at 0905.





# Photographic Log

**Photo No. 19:** Sieve No. 07

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 10%

**Field Observations:**  
 Sample collected at 1010. Depth of water = 12.7 ft. No odor. 1 inch of loose, sandy material followed by dense silty/clay. Shells present. Wood chips, fine wood debris, and larger pieces of bark were present.

**Sample SD73 collected on 11/30/2022 at 0935.**



**Photo No. 20:** Sieve No. 03

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 5%

**Field Observations:**  
 Sample collected at 1030. Depth of water = 13.1 ft. No odor. Dense silty-clay. No large wood debris. Mostly fine organic matter with mixed shells. Limited wood debris noted.





# Photographic Log

<b>Photo No. 21:</b> Sieve No. 20
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> < 5%
<b>Field Observations:</b> Sample collected at 1042. Depth of water = 12.9 ft. No odor. Greyish, brown dense silt. Larger and finer shell material. Small volume of fine wood material.



<b>Photo No. 22:</b> Sieve No. 08
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> < 5%
<b>Field Observations:</b> Sample collected at 1100. Depth of water = 13.1 ft. No odor. Fine-grained silt. Broken shell and organic matter present. Very small volume of wood debris. Mostly fine material.





# Photographic Log

**Photo No. 23:** Sieve No. 01

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 10 – 15%

**Field Observations:**  
 Sample collected at 1114. Depth of water = 13.6 ft. No odor. 2 inch of loose sand material, followed by black, dense clayey material. Large volume of shells and organisms (worms, crabs). Few larger pieces of bark present. Limited fine-grained wood material.

**Sample SD72 collected on 11/30/2022 at 1025.**



**Photo No. 24:** Sieve No. 09

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 15 – 20%

**Field Observations:**  
 Sample collected at 1137. Depth of water = 14.3 ft. Strong odor (rotten egg smell). Large and fine shell pieces. Organisms (worms, crabs). Little to no fine wood debris. Few larger bark pieces and branches (associated with vegetation).

**Sample SD74 collected on 11/30/2022 at 1115.**





# Photographic Log

<b>Photo No. 25:</b> Sieve No. 10
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> < 5%
<b>Field Observations:</b> Sample collected at 1145. Depth of water = 14.6 ft. No odor. Shells present. No large wood debris. Little fine grained material mixed with other organic material.



<b>Photo No. 26:</b> Sieve No. 19
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> < 5%
<b>Field Observations:</b> Sample collected at 1200. Depth of water = 14.6 ft. No odor. Shells and organisms (worms) present. No large wood debris/bark present. Presence of fine grained organic matter, hard to tell if wood waste or not.





# Photographic Log

<b>Photo No. 27:</b> Sieve No. 18
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> < 5%
<b>Field Observations:</b> Sample collected at 1210. Depth of water = 14.0 ft. No odor. Small rocks and broken shells present. No large wood debris present. Fine grained wood debris mixed with other organic matter. Organisms present (worms).



<b>Photo No. 28:</b> Sieve No. 16
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> 5%
<b>Field Observations:</b> Sample collected at 1220. Depth of water = 12.9 ft. No odor. Large and fine/broken shell material. No large wood debris/bark present. Fine grained wood debris mixed with other organic matter.





# Photographic Log

**Photo No. 29:** Sieve No. 17

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 10%

**Field Observations:**  
 Sample collected at 1235. Depth of water = 11.7 ft. Strong odor. Small volume of shells present. Fine grained wood debris/bark present. Very fragile.

**Sample SD75 collected on 11/30/2022 at 1145.**



**Photo No. 30:** Sieve No. 12

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** < 5%

**Field Observations:**  
 Sample collected at 1250. Depth of water = 11.2 ft. No odor. Vegetation (leaves, plant roots) present. Removed from sample. Limited shell and small rocks present.





# Photographic Log

<p><b>Photo No. 31:</b> Sieve No. 11</p>
<p><b>Date:</b> 11/29/2022</p>
<p><b>Estimated Wood Debris Volume:</b> &lt; 5%</p>
<p><b>Field Observations:</b>  Sample collected 1300. Depth of water = 11.0 ft. No odor. Large and fine/broken shell material present. Very limited wood/bark debris present.</p>



<p><b>Photo No. 32:</b> Sieve No. 15</p>
<p><b>Date:</b> 11/29/2022</p>
<p><b>Estimated Wood Debris Volume:</b> 5%</p>
<p><b>Field Observations:</b>  Sample collected at 1315. Depth of water = 106 ft. Large and fine/broken shell material present. Organisms present (worms, crabs). Some medium bark chips/mulch-like material. Little to no fine grained wood/bark material.</p>





# Photographic Log

**Photo No. 33:** Sieve No. 14

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 5 – 10%

**Field Observations:** Sample collected at 1325. Depth of water = 9.9 ft. No odor. Large shells and high volume of shell material present mixed with other organic matter. Some fine grained wood/bark debris present.



**Photo No. 34:** Sieve No. 13

**Date:** 11/29/2022

**Estimated Wood Debris Volume:** 5 – 10%

**Field Observations:** Sample collected 1340. Depth of water = 10.1 ft. No odor. High volume of shells and shell material present. Organisms (crabs) present. Mixed organic matter with some fine-grained wood/bark debris. No large pieces present.





# Photographic Log

<b>Photo No. 35:</b> Sieve No. 05
<b>Date:</b> 11/29/2022
<b>Estimated Wood Debris Volume:</b> < 5%
<b>Field Observations:</b> Sample collected at 1350. Depth of water = 10 ft. No odor. No visible wood/bark debris. Mostly shell material.



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double-sided printing.

# **Attachment 4**

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# BIOASSAY TESTING RESULTS

## SOLID WOOD INCORPORATED SITE

### OLYMPIA, WASHINGTON

**Prepared for**

Pioneer Technologies Corporation  
5205 Corporate Center Ct. SE  
Suite A  
Olympia, WA 98503

**Prepared by**

EcoAnalysts, Inc.  
Port Gamble Environmental Laboratory  
4770 NE View Drive  
PO Box 216  
Port Gamble, Washington 98364

**EcoAnalysts Report ID:**

PG1661.01

**Submittal Date**

January 19, 2023



All testing reported herein was performed consistent with our laboratory's quality assurance program. All results are intended to be considered in their entirety, and EcoAnalysts is not responsible for use of less than the complete report. The test results summarized in this report apply only to the sample(s) evaluated. This document is uncontrolled when printed or accessed from electronic distribution.

**APPROVED BY:**

A handwritten signature in black ink, appearing to read "M. Knowlen", written over a horizontal line.

Michelle Knowlen

Project Manager / Senior Aquatic Toxicologist

QA Review:

Mary Ann Rempel-Hester

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## APPENDICES

Appendix A: Test Data, Statistical Comparisons, and Reference-Toxicant Test Results

Appendix B: Chain of Custody Forms, Logs, and Pre-Test Documents

## ACRONYMS AND ABBREVIATIONS

AFDW:	Ash-free dry weight
cm:	Centimeter
CSL:	Cleanup Screening Level
°C:	Degrees Celsius
EC <sub>50</sub> :	Effective Concentration that results in a 50% reduction in a sub-lethal endpoint
g:	Grams
LC <sub>50</sub> :	Lethal Concentration that results in a 50% reduction in survival
L:	Liter
µm:	Micrometer
mg:	Milligram
mg/L:	Milligrams per liter
mL:	Milliliter
mm:	Millimeter
NOEC:	No Observed Effect Concentration
OR:	Oregon
ppt:	parts per thousand
PSEP:	Puget Sound Estuary Protocols (PSEP 1995)
SCO:	Sediment Cleanup Objective
SCUM:	Sediment Cleanup User's Manual
SMS:	Sediment Management Standards
SMARM:	Sediment Management Annual Review Meeting
SOP:	Standard operation procedure
SD:	Standard Deviation
UIA:	Un-ionized ammonia
USACE:	United States Army Corps of Engineers
USEPA:	United States Environmental Protection Agency
WA:	Washington State
WDOE:	Washington (State) Department of Ecology

## 1. INTRODUCTION

EcoAnalysts conducted biological toxicity testing with sediment samples collected by Pioneer as part of a remedial investigation at the Solid Wood Incorporated Site in Olympia, Washington. Sediments were evaluated for biological effects following guidance provided by the Washington State Department of Ecology (WDOE) Sediment Management Standards (SMS) within the Sediment Cleanup User's Manual (SCUM; WDOE 2021). This report presents the results of the bioassay testing portion of the sediment investigation.

## 2. METHODS

This section summarizes the test methods followed for this biological characterization. Test methods followed guidance provided by the Puget Sound Estuary Program (PSEP 1995), the Sediment Cleanup User's Manual (WDOE 2021), and the various updates presented during the Sediment Management Annual Review Meeting (SMARM). Sediment toxicity was evaluated using three standard PSEP bioassays; the 10-day amphipod test, the 20-day juvenile polychaete survival and growth test, and the benthic larval development test.

### 2.1 Sample Collection

Six test sediments were collected on November 30, 2022 by Pioneer personnel, received at EcoAnalysts on December 1, 2022, and triggered for bioassay testing. Two reference sediment samples were collected from Carr Inlet by EcoAnalysts personnel on November 19, 2022 and received the same day. All samples were received within temperature requirements and were subsequently stored in a walk-in cold room at  $4 \pm 2^\circ\text{C}$  in the dark. Following the project's Sampling and Analysis Plan (SAP) instructions, all test samples were sieved through a 4-mm screen prior to testing to remove macrofauna and large cobble/debris. Reference samples with noticeable native fauna were also press-sieved through a 2-mm screen to prevent interference with bioassay test organisms and following guidance recommendations. All tests were conducted within the eight-week holding time for the project sediments.

### 2.2 Negative Control Samples

A coarse sand from Yaquina Bay, Oregon was provided by Northwest Amphipod for use as the control sediment treatment for the amphipod and polychaete tests. This sediment has been routinely tested in conjunction with these species at this laboratory and results from historical testing have demonstrated acceptable organism health and sediment quality. For the sediment larval bioassay, clean filtered seawater was employed for the control treatment.

### 2.3 Sample Grain Size and Reference Comparison

Sediment grain size is one of the characteristics used in selecting the appropriate reference sediment(s) to compare the chemical and biological responses of project sediments. The percent fines value is defined as the amount of sediment that passes through a 62.5- $\mu\text{m}$  sieve, expressed as a percentage of the total sample analyzed (PSEP 1986). This value can also be derived from the sum of the silt and clay fractions of the sample when determined by conventional particle-size determination (Plumb 1981). The reference sediment grain size should have a percent fines value within 20% of the corresponding test sediment to which it is being compared to (WDOE 2021).

Wet-sieve grain size was performed on all test and reference samples by EcoAnalysts personnel. A summary of these results is provided in Table 2-1.

**Table 2-1. Sample and Reference Grain Size Comparison**

Sample ID	Sample Abbreviation	Percent Fines	Treatment Compared To
CARR-REF-1	CARR-REF-1	50	
CARR-REF-7	CARR-REF-7	16	
WB-SO-SD70-0005	SD70	18	CARR-REF-7
WB-SO-SD71-0005	SD71	22	CARR-REF-7
WB-SO-SD72-0005	SD72	46	CARR-REF-1
WB-SO-SD73-0005	SD73	30	CARR-REF-7
WB-SO-SD74-0005	SD74	62	CARR-REF-1
WB-SO-SD75-0005	SD75	38	CARR-REF-1

Grain size is an important factor in selecting the appropriate reference sample to compare against, especially for the amphipod test (WDOE 2019). Samples were compared to either CARR-REF-1 or CARR-REF-7 (both collected from Carr Inlet, WA) for the purposes of evaluating the sediment under the sediment management standards. The percent fines of the reference sediment was within 2-14% of the comparative test sample values, which was within the ≤20% objective.

Station coordinates for the reference samples are summarized in Table 2-2.

**Table 2-2. Reference Station Coordinates**

Reference Sample	Station	Latitude	Longitude
CARR-REF-1	CRR1-53a	47.33372	-122.66432
CARR-REF-7	CR22	47.33192	-122.67063

Sediment grain size is also one of the characteristics used in selecting the appropriate amphipod test species to use for the program (*Ampelisca abdita*, *Eohaustorius estuarius*, or *Rhepoxynius abronius*). The species *A. abdita* is often recommended when sediments are composed of greater than 60% fines whereas the species *E. estuarius* prefers medium to fine sand sediments and is often recommended when sediments are composed of less than 60% fines (PSEP 1995). Due to the low percentage of fine-grained sediments, the amphipod *E. estuarius* was selected for this program.

## 2.4 Bulk Sample Porewater Ammonia and Water Quality Measurements

Prior to testing, bulk sediment porewater ammonia concentrations and salinity were measured to determine whether any methods modifications or supplemental testing would be required (Table 2-3). Bulk sediments are homogenized test samples that have not been further processed for bioassay testing.

**Table 2-3. Bulk Sediment Porewater Measurements**

Sample	Matrix: Bulk Porewater					
	Total Ammonia (mg/L)	Unionized Ammonia (mg/L)	Salinity (ppt)	pH	Total Sulfides (mg/L)	Hydrogen Sulfide (mg/L)
SD70	1.48	0.019	29	7.7	ND	ND
SD71	1.15	0.015	29	7.7	0.003	0.000
SD72	1.44	0.019	29	7.7	0.000	0.000
SD73	1.22	0.013	29	7.6	0.016	0.002
SD74	1.24	0.014	29	7.6	ND	ND
SD75	0.874	0.010	29	7.6	0.026	0.003

For the purposes of evaluating the potential toxicity of sediment under the guidelines established in the Sediment Cleanup User’s Manual (WDOE 2019), factors such as ammonia and sulfides are considered an inherent component of the in-situ sediment conditions. As such, these factors are usually not removed through manipulations such as purging.

## 2.5 10-day Amphipod Bioassay

The 10-day amphipod acute toxicity test was conducted with *Eohaustorius estuarius*. Test organisms were supplied by Northwest Amphipod in Newport, Oregon and held in native sediment. The organisms were acclimated to, and held at,  $15 \pm 1^\circ\text{C}$  prior to test initiation.

The amphipod bioassay was conducted as a 10-day static exposure with five replicates for each test treatment, reference treatment, and control. Two centimeters of sediment (approximately 175 mL) were placed into each 1-L glass chamber with 775 mL of overlying water. Trickle-flow aeration was provided through glass pipettes, and care was taken to avoid disturbing the sediment surface. Test chambers were placed into randomly assigned positions and allowed to equilibrate to test conditions overnight.

Prior to the test initiation, water quality measurements were taken in a surrogate replicate for each test treatment and included dissolved oxygen, temperature, salinity, and pH. Ammonia and sulfide concentrations were measured in both interstitial (porewater) and overlying water at initiation and termination. These measurements were made from a sacrificial surrogate chamber for each test treatment. Sediment porewater was extracted via centrifugation. During the test, water quality was monitored daily in one surrogate replicate per treatment.

To initiate the test, organisms were randomly allocated to each of the test chambers. Initial stocking densities were 20 organisms per test chamber. Amphipods that did not bury within approximately one hour were replaced with healthy amphipods. No food was provided during the 10-day exposure for the amphipod test.

At test termination, sediment from each test chamber was sieved through a 0.5-mm screen to recover all organisms. The number of surviving and dead amphipods was then enumerated.

## 2.6 20-day Juvenile Polychaete Bioassay

The 20-day polychaete survival and growth test was conducted with juvenile polychaete worms (*Neanthes arenaceodentata*). Test organisms were obtained from Aquatic Toxicology Support in

Bremerton, Washington and held in seawater at 20°C (Neanthes were cultured in water-only and were not held in sediment prior to testing).

The polychaete bioassay was conducted as a 20-day static-renewal test, with overlying exchanges of 300 mL of water occurring every third day. Each test treatment, reference treatment, and control consisted of five replicates of 1-L glass chambers, which were filled with two centimeters of sediment (approximately 175 mL) and 775 mL of overlying water. Trickle-flow aeration was provided through glass pipettes, and care was taken to avoid disturbing the sediment surface. Test chambers were then randomly assigned positions and allowed to equilibrate to test conditions overnight.

Prior to the test initiation, water quality measurements were taken in a surrogate chamber for each test treatment and included dissolved oxygen, temperature, salinity, and pH. Ammonia and sulfide concentrations were measured in both interstitial (porewater) and overlying water at initiation and termination. These measurements were made from a sacrificial surrogate chamber for each test treatment. Sediment porewater was extracted via centrifugation. During the test, water quality was monitored daily in one surrogate replicate per treatment.

To initiate the test, organisms were randomly allocated to each of the test chambers. Initial stocking densities were five worms per test chamber. During the test, organisms were fed a diet of 40-mg of TetraMin® slurry every other day (approximately 8-mg dry weight per worm). Pre-test initial biomass was determined by taking dry weight and ash-free dry weight (AFDW) measurements of three replicates of five worms each on Day 0.

At test termination, sediment from each test chamber was sieved through a 0.5-mm screen. All worms were recovered, enumerated, rinsed in deionized water (to remove salt), and transferred to pre-weighed aluminum foil weigh boats. After drying in an oven at 60°C for approximately 24 hours, each weigh boat was removed, cooled in a desiccator and weighed to obtain dry weight measurements. They were then heated to 550°C for two hours to determine the ashed weight. AFDW were calculated to correct for the influence of sediment grain size differences between treatments:

$$\text{AFDW} = \text{Dry weight} - \text{Ashed weight}$$

Both dry weight and AFDW were used to determine individual worm weight and growth rates. The dry weight growth rate is calculated using the following equation:

$$G = (\text{DWT}_{t_2} - \text{DWT}_{t_1}) \div (t_2 - t_1)$$

Where:  $\text{DWT}_{t_2}$  = individual dry weight of surviving adults at test termination

$\text{DWT}_{t_1}$  = mean individual dry weight of organisms at test initiation

$t_2 - t_1$  = duration of test (e.g. days)

The AFDW growth rate is calculated using the following equations:

$$\text{AFDW} = (\text{Final Dry Weight} - \text{Final Ashed Weight}) \div \text{\#Survivors}$$

$$G = (\text{AFDW}_{t_2} - \text{AFDW}_{t_1}) \div (t_2 - t_1)$$

Where:  $\text{AFDW}_{t_2}$  = individual ash-free dry weight of surviving adults at test termination

$\text{AFDW}_{t_1}$  = mean individual ash-free dry weight of organisms at test initiation

$t_2 - t_1$  = duration of test (e.g. days)

## 2.7 Larval Development Bioassay

The bivalve larval development test was conducted with the mussel, *Mytilus galloprovincialis*. Adult organisms were obtained from Taylor Shellfish in Shelton, Washington and were acclimated then held under flowing seawater at natural temperatures ( $15\pm 2^{\circ}\text{C}$ ) prior to spawning induction. Adult mussels were fed during the holding period a marine algal suspension ad libitum. The control treatment consisted of a clean filtered seawater-only control.

The larval development bioassay was conducted as a static exposure with five replicates for each test treatment, reference treatment, and control. Approximately 18 g ( $\pm 1$  g) of sediment was placed into each 1-L glass chamber with 900 mL of overlying water. Test chambers were then shaken for 10 seconds and placed into randomly assigned positions. The larval test was performed with aeration upon test initiation to prevent dissolved oxygen levels from falling below threshold levels. Trickle-flow aeration was provided through glass pipettes, and care was taken to avoid disturbing the sediment surface.

Prior to the test initiation, water quality measurements were taken in the surrogate chamber for each test treatment and included dissolved oxygen, temperature, salinity, and pH. Ammonia and sulfide concentrations were measured in the overlying water at initiation and termination. These measurements were made from a sacrificial surrogate chamber for each test treatment. During the test, water quality was monitored daily in one surrogate replicate per treatment.

To obtain gametes for testing, adult mussels to be spawned were placed in clean seawater at  $16^{\circ}\text{C}$  (culture temperature) for approximately 30 – 60 minutes in the presence of dense marine algal suspension. The mussels were then transferred to containers with culture water adjusted to  $20 - 23^{\circ}\text{C}$  for the purpose of inducing the release of gametes. The animals were held at the shocking temperature and were monitored for spawning individuals. Spawning females and males were removed from the water bath and placed in individual containers with seawater. These individuals were allowed to spawn until sufficient gametes were available to initiate the test. After the spawning period, eggs were transferred to fresh seawater and filtered through a 0.5 mm Nitex<sup>®</sup> mesh screen to remove large debris, feces, and excess gonadal matter. A composite was made of the sperm and diluted with fresh seawater. The fertilization process was initiated by adding sperm to the isolated egg containers. Egg-sperm solutions were periodically homogenized with a perforated plunger during the fertilization process and subsamples observed under the microscope for egg and sperm viability. Approximately one to one and a half hours after fertilization, embryo solutions were checked for fertilization rate. Only those embryo stocks with  $>90\%$  fertilization were used to initiate the tests. Embryo solutions were rinsed free of excess sperm and then combined to create one embryo stock solution. Density of the embryo stock solution was determined by counting the number of embryos in a subsample of homogenized stock solution. This was used to determine the volume of embryo stock solution to deliver approximately 27,000 embryos to each test chamber.

The protocol calls for test termination when 95% of the embryos in the control have reached the prodissoconch I stage (approximately 48-60 hours). Due to the predominance of fine organics and wood debris which can trap or bind to the larvae, the SMARM resuspension protocol was employed prior to test termination (Gardiner 2010). At termination, the overlying seawater was decanted into a clean 1-L jar and mixed with a perforated plunger. From this container, a 10 mL subsample was transferred to a scintillation vial and preserved in 10% buffered formalin. Larvae were subsequently stained with a dilute solution of Rose Bengal in 70% ethanol to help visualization of larvae. The number of normal and abnormal larvae was enumerated on an inverted microscope. Normal larvae included all D-shaped prodissoconch I stage larvae. Abnormal larvae included abnormally shaped prodissoconch I larvae and all early stage larvae.



## 2.8 Data Analysis and QA/QC

All laboratory instruments were calibrated daily or on their recommended schedule. Records of instrument calibration were retained in the laboratory logs.

All water quality and endpoint data were entered into Excel spreadsheets. Water quality parameters were summarized by calculating the mean, minimum, and maximum values for each test treatment. Endpoint data were calculated for each replicate and the mean values and standard deviations were determined for each test treatment.

All hand-entered data was reviewed for data entry errors, which were corrected prior to summary calculations. A minimum of 10% of all calculations and data sorting were reviewed for errors. Review counts were conducted on any apparent outliers.

For Sediment Cleanup Objective (SCO) and Cleanup Screening Level (CSL) suitability determinations, comparisons were made according to the Sediment Cleanup User's Manual (SCUM; WDOE 2021) and Fox et al. (1998), using BioStat software. All data were tested for normality using the Shapiro-Wilk test and equality of variance using Levene's test. Data reported as percent mortality or survival were transformed using an arcsine square root transformation prior to statistical analysis. Growth data with unequal variance were log<sub>10</sub> transformed prior to statistical analysis. Determinations of statistical significance were based on one-tailed Student's t-tests with an alpha of 0.05. A comparison of the larval endpoint relative to the reference was made using an alpha level of 0.10. For samples failing to meet assumptions of normality, a Mann-Whitney test was conducted to determine significance. For those samples failing to meet the assumptions of normality and equality of variance, a t-test on rankits was used.

To evaluate the relative sensitivity of the organisms, reference toxicity tests (positive controls) were performed using standard reference toxicants (Lee 1980). A water-only reference-toxicant test was conducted concurrently with the sediment tests using ammonium chloride. The ammonium chloride reference-toxicant test was used to ensure animals used in the test were healthy and of similar sensitivity to prior tests. This test also provided information on the sensitivity to ammonia concentrations that would possibly be present in the sediments.

Statistical analyses of all dose-response tests were performed using CETIS Comprehensive Toxicity Data Analysis and Database Software version 1.9.4.3. Comparisons between the lab control and each test concentration were performed following recommended USEPA decision matrices (USEPA 2002).

### 3. RESULTS

The results of the sediment testing, including a summary of test results and water quality observations are presented in this section. All data, laboratory bench sheets, and statistical analyses are provided in Appendix A while chain of custody forms and pre-test documents are supplied in Appendix B.

#### 3.1 10-day Amphipod Bioassay

The bioassay test with *E. estuarius* was initiated on December 13, 2022. It was validated with 1% mortality in the native sediment control, which met the performance criterion of  $\leq 10\%$  mortality for SMS evaluations and indicated that the test conditions were suitable for adequate amphipod survival. Mean mortality in the reference treatments was 1-9%, which met the performance criteria ( $\leq 25\%$  mortality) and indicated that the reference sediments were acceptable for suitability determination. Mean mortality in the project samples was 7-18%. All endpoint results are summarized in Table 3-1. Summaries of water quality measurements, ammonia and sulfide concentrations, and test conditions are presented in Table 3-2 through Table 3-5.

Water quality parameters were within the acceptable limits throughout the duration of the test (Table 3-2).

A reference-toxicant test (positive control) was performed on the batch of test organisms utilized for this study. The reference-toxicant test control met the test acceptability criterion and the  $LC_{50}$  value was within control chart limits ( $\pm 2$  standard deviations from the laboratory historical mean) for both total and unionized ammonia. This indicates that the test organisms used in this study were of similar sensitivity to those previously tested.

Ammonia concentrations observed in the *E. estuarius* test were below the No Observed Effect Concentration (NOEC) value derived from the ammonia reference-toxicant test (Table 3-3; compare to NOEC of 75.4 mg/L total ammonia, 1.209 unionized ammonia), and the purging trigger value of 0.8 unionized ammonia. Therefore, ammonia concentrations within the sediment samples should not have been a contributor to any adverse biological effects if observed in the test treatments. Initial and final sulfide concentrations within the overlying water and porewater were below the trigger value of 0.122 mg/L hydrogen sulfide for all treatments, suggesting that sulfides should not have contributed to mortality (Table 3-4).

Table 3-1. Test Results for *Eohaustorius estuarius*

Treatment	Replicate	Number Initiated	Number Surviving	Number Missing or Dead	Percentage Mortality	Mean Percentage Mortality	SD
Control	1	20	20	0	0	1	2.2
	2	20	20	0	0		
	3	20	20	0	0		
	4	20	20	0	0		
	5	20	19	1	5		
CARR-REF-1	1	20	19	1	5	9	6.5
	2	20	19	1	5		
	3	20	16	4	20		
	4	20	19	1	5		
	5	20	18	2	10		
CARR-REF-7	1	20	20	0	0	1	2.2
	2	20	19	1	5		
	3	20	20	0	0		
	4	20	20	0	0		
	5	20	20	0	0		
SD70	1	20	18	2	10	9	4.2
	2	20	18	2	10		
	3	20	17	3	15		
	4	20	19	1	5		
	5	20	19	1	5		
SD71	1	20	17	3	15	8	5.7
	2	20	19	1	5		
	3	20	18	2	10		
	4	20	18	2	10		
	5	20	20	0	0		
SD72	1	20	15	5	25	18	15.2
	2	20	17	3	15		
	3	20	12	8	40		
	4	20	20	0	0		
	5	20	18	2	10		
SD73	1	20	20	0	0	7	7.6
	2	20	20	0	0		
	3	20	17	3	15		
	4	20	19	1	5		
	5	20	17	3	15		
SD74	1	20	16	4	20	13	9.1
	2	20	19	1	5		
	3	20	19	1	5		
	4	20	15	5	25		
	5	20	18	2	10		
SD75	1	20	20	0	0	9	5.5
	2	20	18	2	10		
	3	20	17	3	15		
	4	20	18	2	10		
	5	20	18	2	10		

Table 3-2. Water Quality Summary for *Eohaustorius estuarius*

Treatment	Dissolved Oxygen (mg/L) ≥ 5.1 mg/L			Temperature (°C) 15 ± 1°C			Salinity (ppt) 28 ± 1 ppt			pH 7 – 9 units		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	8.3	8.0	8.5	15.5	14.8	16.1	28	28	28	8.0	7.9	8.1
CARR-REF-1	8.1	7.8	8.3	15.5	14.7	16.2	28	28	29	8.1	8.0	8.1
CARR-REF-7	8.2	8.1	8.6	15.4	14.7	16.1	28	28	29	8.1	8.0	8.2
SD70	8.2	7.9	8.4	15.4	14.7	15.8	28	28	28	8.2	8.0	8.5
SD71	8.2	7.9	8.3	15.4	14.9	15.9	28	27	28	8.2	8.0	8.5
SD72	7.9	7.6	8.2	15.7	14.8	16.3	28	27	28	8.0	7.9	8.3
SD73	8.3	8.1	8.6	15.3	14.8	15.9	28	28	29	8.1	8.0	8.1
SD74	8.1	7.8	8.4	15.4	14.8	16.1	28	28	28	8.2	8.0	8.6
SD75	8.0	7.2	8.4	15.6	14.9	15.9	28	28	28	8.0	7.9	8.2

Table 3-3. Ammonia Summary for *Eohaustorius estuarius*

Treatment	Overlying				Interstitial			
	Total Ammonia (mg/L Total) NOEC = 75.4 mg/L <sup>1</sup>		Unionized Ammonia (mg/L) NOEC = 1.209 <sup>1</sup> Trigger Value = 0.8		Total Ammonia (mg/L Total) NOEC = 75.4 mg/L <sup>1</sup>		Unionized Ammonia (mg/L) NOEC = 1.209 <sup>1</sup> Trigger Value = 0.8	
	Day 0	Day 10	Day 0	Day 10	Day 0	Day 10	Day 0	Day 10
Control	0.00	0.00	0.000	0.000	0.00	0.0319	0.000	0.000
CARR-REF-1	1.26	1.50	0.033	0.038	7.51	4.80	0.064	0.062
CARR-REF-7	1.31	4.24	0.036	0.168	6.66	5.88	0.058	NM
SD70	1.07	0.928	0.029	0.071	4.26	4.30	0.046	0.055
SD71	0.682	0.272	0.018	0.021	4.28	3.21	0.045	0.027
SD72	0.438	0.00	0.012	0.000	2.21	2.23	0.019	0.029
SD73	0.383	0.00	0.010	0.000	1.57	2.25	0.013	0.029
SD74	0.260	0.00	0.007	0.000	1.47	1.04	0.013	0.014
SD75	0.610	0.00	0.013	0.000	2.54	1.01	0.023	0.009

<sup>1</sup>NOEC derived from reference-toxicant test

<sup>2</sup>Inouye et al. 2015

NM = Not Measured due to insufficient porewater for salinity measurement

Table 3-4. Sulfide Summary for *Eohaustorius estuarius*

Treatment	Overlying				Interstitial			
	Total Sulfides (mg/L)		Hydrogen Sulfide (mg/L) Trigger Value = 0.122 mg/L <sup>1</sup>		Total Sulfides (mg/L)		Hydrogen Sulfide (mg/L) Trigger Value = 0.122 mg/L <sup>1</sup>	
	Day 0	Day 10	Day 0	Day 10	Day 0	Day 10	Day 0	Day 10
Control	ND	ND	ND	ND	0.016	ND	0.0040	ND
CARR-REF-1	ND	ND	ND	ND	0.010	0.002	0.0017	0.0002
CARR-REF-7	ND	0.005	ND	0.0002	0.001	NM	0.0002	NM
SD70	0.004	0.009	0.0002	0.0002	0.044	ND	0.0062	ND
SD71	ND	0.007	ND	0.0001	0.055	0.002	0.0079	0.0004
SD72	0.000	ND	0.0000	ND	ND	0.002	ND	0.0002
SD73	0.004	ND	0.0003	ND	0.007	0.008	0.0012	0.0009
SD74	0.001	ND	0.0001	ND	0.003	0.013	0.0005	0.0015
SD75	0.001	ND	0.0001	ND	0.003	ND	0.0005	ND

<sup>1</sup>Inouye et al. 2015

ND = Not Detected; measurement below detection limit

NM = Not Measured due to insufficient porewater for analysis

**Table 3-5. Test Condition Summary for *Eohaustorius estuarius***

Test Conditions: PSEP <i>E. estuarius</i>		
Date Sampled	November 30, 2022 (test samples) November 18, 2022 (reference sample)	
Date Received	December 1, 2022 (test samples) November 19, 2022 (reference sample)	
Test Dates	December 13 – 23, 2022	
Sample Storage Conditions	4°C, dark	
Days of Holding Recommended: ≤8 weeks (56 days)	13 Days (test samples) 25 Days (reference samples)	
Source of Control Sediment	Yaquina Bay, OR	
Test Species	<i>Eohaustorius estuarius</i>	
Supplier	Northwest Amphipod in Newport, OR	
Date Acquired	December 7, 2022	
Age Class	Mature adult, 3-5 mm	
Test Procedures	PSEP 1995 with SMARM revisions, SCUM (WDOE 2021)	
Test Location	EcoAnalysts Port Gamble Laboratory	
Test Type/Duration	10-Day static	
Control Water	North Hood Canal seawater, 0.45µm filtered	
Test Lighting	50 – 100 foot candles (ambient and constant)	
Test Chamber	1-Liter Glass Chamber	
Replicates per Treatment	5 + 2 surrogates (one used for WQ measurements throughout the test)	
Organisms per Replicate	20	
Exposure Volume	175 mL sediment/ 775 mL water	
Feeding	None	
Water Renewal	None	
Test Dissolved Oxygen	Recommended: > 5.1 mg/L	Observed: 7.2 – 8.6 mg/L
Test Temperature	Recommended: 15 ± 1 °C	Observed: 14.7 – 16.3°C
Test Salinity	Recommended: 28 ± 1 ppt	Observed: 27 – 29 ppt
Test pH	Recommended: 7 - 9	Observed: 7.9 – 8.6
Control Performance Standard SMS	Recommended: Control ≤ 10% mortality	Observed mortality: 1%
Reference Performance Standard SMS	Recommended: Reference ≤ 25% mortality	Observed mortality: 1-9%
Reference Toxicant Endpoint	Total Ammonia	Unionized Ammonia
Reference Toxicant LC <sub>50</sub>	157.4 mg/L	1.699
Mean; Acceptable Range	158.2; 67.9 – 368.4 mg/L	2.097; 0.950 – 4.628
NOEC (total ammonia)	75.4 mg/L	1.209 mg /L
Deviations from Test Protocol	None	

### 3.2 20-day Juvenile Polychaete Bioassay

The bioassay test with *N. arenaceodentata* was initiated on December 14, 2022. The test was validated with 0% mortality in the control. Mean individual growth rate (MIG) in the control was 1.814 mg/ind/day (dry weight) and 1.416 mg/ind/day (AFDW). These values fall within the test acceptability criteria for SMS evaluations of <10% mean mortality and  $\geq 0.38$  mg/ind/day AFDW, indicating that the test conditions were suitable for adequate polychaete survival and growth. A summary of the test results for all samples is shown in Table 3-6. Summaries of water quality measurements, ammonia and sulfide concentrations, and test conditions are presented in Table 3-7 through Table 3-10.

Mean mortality in the reference treatments was 0-4%, and the mean individual growth rate was 1.267 – 1.586 mg/ind/day (AFDW). When compared to the control, MIG expressed as AFDW for the reference treatments was 0.89 – 1.12. This ratio met the reference performance standard of  $\geq 0.80$  (WDOE 2021).

Mortality in the project sediments was 0% for all samples. Mean individual growth (as dry weight) in the test treatments was 1.340 – 1.815 mg/ind/day. Mean individual growth in the AFDW assessment, which removes variability caused by gut contents, was 1.182 – 1.609 mg/ind/day as AFDW.

All water quality parameters were within the acceptable limits throughout the duration of the test, with the exception of temperature on Day 3 which fell below the recommended range of  $20 \pm 1$  °C (Table 3-7). Once noticed, the water bath level was immediately decreased to increase the temperature, which remained within parameters for the remainder of the test. The feeding on Day 0 and the water renewal on Day 12 were inadvertently missed, therefore each was completed the following day. These deviations are not expected to have affected the test results.

Initial mean individual biomass (pretest) of the test organisms met the recommended criterion of 0.25 – 1.0 mg/individual at 0.993 mg/ind dry weight and 0.537 mg/ind AFDW.

A reference-toxicant test (positive control) was performed on the batch of test organisms utilized for this study. The reference-toxicant test control met the test acceptability criterion and the  $LC_{50}$  value was within control chart limits ( $\pm 2$  standard deviations from the laboratory historical mean) for both total and unionized ammonia. This indicates that the test organisms used in this study were of similar sensitivity to those previously tested.

Ammonia concentrations observed in the *N. arenaceodentata* test were below the NOEC value derived from the concurrent ammonia reference-toxicant test (Table 3-8; compare to NOEC of 107 mg/L total ammonia, 1.597 mg/L unionized ammonia) and the purging trigger of 0.46 mg/L unionized ammonia. Sulfide concentrations were below the trigger value of 3.4 mg/L hydrogen sulfide (Inouye et al. 2015) for all samples (Table 3-9).



Table 3-6. Test Results for *Neanthes arenaceodentata*

Treatment	Rep	Number Initiated	Survivors	Mean Mortality	Individual Growth Rate (mg/ind/day)					
					Dry	Mean	SD	AFDW	Mean	SD
Control	1	5	5	0	1.756	1.814	0.16	1.255	1.416	0.188
	2	5	5		1.984			1.636		
	3	5	5		1.657			1.311		
	4	5	5		1.678			1.273		
	5	5	5		1.996			1.606		
CARR-REF-1	1	5	5	0	2.155	1.886	0.17	1.829	1.586	0.145
	2	5	5		1.713			1.468		
	3	5	5		1.794			1.489		
	4	5	5		1.854			1.554		
	5	5	5		1.916			1.589		
CARR-REF-7	1	5	5	4	1.566	1.611	0.42	1.197	1.267	0.410
	2	5	5		1.496			1.192		
	3	5	5		1.480			1.032		
	4	5	5		1.197			0.939		
	5	5	4		2.313			1.973		
SD70	1	5	5	0	2.034	1.679	0.30	1.702	1.443	0.253
	2	5	5		1.794			1.585		
	3	5	5		1.521			1.245		
	4	5	5		1.786			1.537		
	5	5	5		1.257			1.095		
SD71	1	5	5	0	1.640	1.815	0.22	1.464	1.609	0.224
	2	5	5		1.691			1.463		
	3	5	5		2.151			1.939		
	4	5	5		1.676			1.434		
	5	5	5		1.918			1.747		
SD72	1	5	5	0	1.273	1.463	0.36	1.147	1.299	0.367
	2	5	5		1.225			1.054		
	3	5	5		1.393			1.202		
	4	5	5		1.333			1.144		
	5	5	5		2.092			1.949		
SD73	1	5	5	0	1.156	1.417	0.54	0.955	1.238	0.534
	2	5	5		1.378			1.167		
	3	5	5		1.883			1.704		
	4	5	5		0.675			0.537		
	5	5	5		1.995			1.826		
SD74	1	5	5	0	1.266	1.340	0.80	1.113	1.182	0.773
	2	5	5		1.116			0.940		
	3	5	5		0.710			0.577		
	4	5	5		2.718			2.517		
	5	5	5		0.889			0.762		
SD75	1	5	5	0	1.390	1.556	0.18	1.274	1.401	0.166
	2	5	5		1.413			1.245		
	3	5	5		1.500			1.354		
	4	5	5		1.816			1.645		
	5	5	5		1.662			1.489		

**Table 3-7. Water Quality Summary for *Neanthes arenaceodentata***

Treatment	Dissolved Oxygen (mg/L) ≥4.6 mg/L			Temperature (°C) 20 ± 1°C			Salinity (ppt) 28 ± 2 ppt			pH 7 - 9 units		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	7.2	6.7	7.8	20.3	<b>16.3</b>	20.9	29	28	30	7.9	7.7	8.1
CARR-REF-1	7.3	6.9	7.6	20.4	<b>16.5</b>	21.0	29	28	30	8.0	7.8	8.1
CARR-REF-7	7.2	6.9	7.7	20.3	<b>16.7</b>	20.9	29	28	30	7.9	7.8	8.5
SD70	7.2	6.5	7.5	20.4	<b>16.8</b>	21.0	29	28	30	8.3	7.9	8.6
SD71	7.3	7.0	7.8	20.4	<b>16.7</b>	20.9	29	28	30	8.3	8.0	8.5
SD72	7.0	6.4	7.6	20.7	<b>17.4</b>	21.4	29	28	30	8.1	7.7	8.3
SD73	7.2	6.6	7.7	20.7	<b>17.1</b>	21.3	29	28	30	8.0	7.8	8.2
SD74	7.1	6.5	7.5	20.4	<b>17.2</b>	20.9	29	27	30	8.1	7.7	8.3
SD75	7.1	6.5	7.7	20.4	<b>16.7</b>	21.0	29	28	30	8.0	7.8	8.2

**BOLD** = measurement outside of recommended range

**Table 3-8. Ammonia Summary for *Neanthes arenaceodentata***

Treatment	Overlying				Interstitial			
	Total Ammonia (mg/L Total) NOEC = 107 mg/L <sup>1</sup>		Unionized Ammonia (mg/L) NOEC = 1.597 Trigger Value 0.46 <sup>2</sup>		Total Ammonia (mg/L Total) NOEC = 107 mg/L <sup>1</sup>		Unionized Ammonia (mg/L) NOEC = 1.597 Trigger Value 0.46 <sup>2</sup>	
	Day 0	Day 20	Day 0	Day 20	Day 0	Day 20	Day 0	Day 20
Control	0.373	1.49	0.014	0.037	0.00	2.05	0.000	0.021
CARR-REF-1	1.21	0.00	0.057	0.000	9.84	0.621	0.095	0.006
CARR-REF-7	1.41	0.790	0.052	0.020	5.93	2.35	0.113	0.015
SD70	0.865	0.00	0.026	0.000	5.85	2.30	0.113	0.007
SD71	0.645	0.00	0.024	0.000	4.46	0.00	0.085	0.000
SD72	0.645	0.00	0.025	0.000	3.05	0.0372	0.048	0.000
SD73	0.111	0.00	0.004	0.000	2.59	0.00	0.041	0.000
SD74	0.443	0.00	0.016	0.000	2.35	0.00	0.036	0.000
SD75	0.533	0.00	0.020	0.000	2.10	0.00	0.032	0.000

<sup>1</sup>NOEC (concurrent reference-toxicant test derived)

<sup>2</sup>Inouye et al. 2015

**Table 3-9. Sulfide Summary for *Neanthes arenaceodentata***

Treatment	Overlying				Interstitial			
	Total Sulfides (mg/L Total)		Hydrogen Sulfide (mg/L) Trigger Value = 3.4 mg/L <sup>1</sup>		Total Sulfides (mg/L Total)		Hydrogen Sulfide (mg/L) Trigger Value = 3.4 mg/L <sup>1</sup>	
	Day 0	Day 20	Day 0	Day 20	Day 0	Day 20	Day 0	Day 20
Control	0.000	0.012	0.000	0.001	0.010	0.003	0.002	0.001
CARR-REF-1	ND	0.006	ND	0.000	ND	0.003	ND	0.001
CARR-REF-7	ND	0.000	ND	0.000	0.029	0.004	0.003	0.001
SD70	ND	ND	ND	ND	0.014	0.028	0.001	0.011
SD71	0.003	ND	0.000	ND	0.050	0.022	0.005	0.004
SD72	ND	ND	ND	ND	ND	ND	ND	ND
SD73	0.009	0.004	0.000	0.000	0.017	0.000	0.002	0.000
SD74	0.000	ND	0.000	ND	ND	0.043	ND	0.015
SD75	0.002	0.001	0.000	0.000	ND	0.025	ND	0.013

<sup>1</sup>Inouye et al. 2015

ND = not detected; measurement below detection limit

**Table 3-10. Test Condition Summary for *Neanthes arenaceodentata***

Test Conditions: PSEP <i>N. arenaceodentata</i>		
Date Sampled	November 30, 2022 (test samples) November 18, 2022 (reference sample)	
Date Received	December 1, 2022 (test samples) November 19, 2022 (reference sample)	
Test Dates	December 14, 2022 – January 3, 2023	
Sample Storage Conditions	4°C, dark	
Days of Holding Recommended: ≤8 weeks (56 days)	14 Days (test samples) 26 Days (reference samples)	
Source of Control Sediment	Yaquina Bay, OR	
Test Species	<i>Neanthes arenaceodentata</i>	
Supplier	Aquatic Toxicology Support	
Date Acquired	December 14, 2022	
Age Class	Juvenile; 16 days post-emergence	
Test Procedures	PSEP 1995 with SMARM revisions, SCUM (WDOE 2021)	
Test Location	EcoAnalysts Port Gamble Laboratory	
Test Type/Duration	20-Day static renewal	
Control Water	North Hood Canal seawater, 0.45µm filtered	
Test Lighting	50 – 100 foot candles (ambient and constant)	
Test Chamber	1-Liter Glass Chamber	
Replicates per Treatment	5 + 2 surrogates (one used for WQ measurements throughout the test)	
Organisms per Replicate	5	
Exposure Volume	175 mL sediment/ 775 mL water	
Feeding	40 mg/jar every other day (8 mg/ind every other day)	
Water Renewal	Water renewed every third day (1/3 volume of exposure chamber)	
Test Dissolved Oxygen	Recommended: > 4.6 mg/L	Observed: 6.4 – 7.8 mg/L
Test Temperature	Recommended: 20 ± 1 °C	Observed: 16.3 – 21.4 °C
Test Salinity	Recommended: 28 ± 2 ppt	Observed: 27 – 30 ppt
Test pH	Recommended: 7 - 9	Observed: 7.7 – 8.6
Initial Biomass	Recommended: 0.5 - 1.0 mg Minimum: 0.25 mg	0.993 mg (dry weight) 0.537 mg (AFDW)
Control Performance Standard	Recommended: Mortality ≤ 10%	Observed: 0%
	Recommended: ≥ 0.38 mg/ind/day (as AFDW)	Observed: 1.416 mg/ind/day
Reference Performance Standard	Recommended: MIG <sub>Reference</sub> /MIG <sub>Control</sub> ≥ 0.80 (as AFDW)	0.89 – 1.12
Reference Toxicant Endpoint	Total Ammonia	Unionized Ammonia
Reference Toxicant LC <sub>50</sub>	214.8 mg/L	2.43 mg/L
Mean; Acceptable Range	184.2; 128.6 – 263.9 mg/L	2.603; 1.685 – 4.021 mg/L
NOEC	107 mg/L	1.597 mg/L
Deviations from Test Protocol	Temperature (Day 3), Feeding (Day 0), Renewal (Day 12)	

### 3.3 Larval Development Bioassay

The larval development test with *M. galloprovincialis* was initiated on December 7, 2022. The test was validated by 0.94 proportion normal survivorship (defined as the mean number of normal larvae within the control divided by the stocking density) in the seawater control. This value was within the SMS control acceptability criterion of  $\geq 0.70$ . A summary of the test results for all samples is shown in Table 3-11. Summaries of water quality measurements, ammonia and sulfide concentrations, and test conditions are presented in Table 3-12 through Table 3-14.

Mean number normal of the reference treatments was 0.79-0.95 of the seawater control response, meeting the SMS reference acceptability criteria ( $N_R/N_C$ ) of  $\geq 0.65$ . This is defined as the number of normal larvae in the reference sample(s) divided by the number of normal larvae in the control. The test mean chamber stocking density (measured at test initiation) was 30.7 embryos/mL and was within the test objective of 20 – 40 embryos/mL.

Water quality parameters were within acceptable limits throughout the test with the exception of temperature on Day 1 in the reference treatment CARR-REF-7, which was slightly above the recommended range of  $16 \pm 1$  °C (Table 3-12).

A reference-toxicant test (positive control) was performed on the batch of test organisms utilized for this study. The reference-toxicant test control met the test acceptability criterion and the  $EC_{50}$  value was within control chart limits ( $\pm 2$  standard deviations from the laboratory historical mean) for total ammonia, while slightly below for unionized ammonia. This indicates that the test organisms used in this study were of similar sensitivity to those previously tested.

There were no measurable ammonia concentrations observed in the *M. galloprovincialis* test (Table 3-13), thus ammonia is unlikely to have contributed to biological effects within the samples. Sulfide concentrations were below the trigger value of 0.0025 mg/L hydrogen sulfide (Inouye et al. 2015), indicating that sulfides within the sediment samples are unlikely to have contributed to any adverse biological effects observed in the test treatments.

Table 3-11. Test Results for *Mytilus galloprovincialis*

Treatment	Rep	Number Normal	Number Abnormal	Mean # Normal (N)	SD	Control Normal Survival N <sub>c</sub> /I	Reference Normal Survival Relative to Control N <sub>R</sub> /N <sub>c</sub>	Performance Standard
Seawater Control	1	285	3	289.8	10.1	0.94		≥0.70; Meets Criterion
	2	289	1					
	3	301	2					
	4	298	4					
	5	276	0					
CARR-REF-1	1	207	14	229.4	36.8		0.79	≥0.65; Meets Criterion
	2	279	4					
	3	257	21					
	4	192	35					
	5	212	26					
CARR-REF-7	1	284	2	274.4	56.5		0.95	≥0.65; Meets Criterion
	2	238	2					
	3	233	1					
	4	369	4					
	5	248	2					
SD70	1	270	10	271.0	4.8			
	2	278	4					
	3	273	2					
	4	269	4					
	5	265	1					
SD71	1	234	3	255.0	14.1			
	2	256	1					
	3	262	2					
	4	251	4					
	5	272	2					
SD72	1	218	8	262.6	28.6			
	2	250	3					
	3	277	3					
	4	284	3					
	5	284	4					
SD73	1	252	5	236.0	15.9			
	2	251	5					
	3	233	2					
	4	230	14					
	5	214	16					
SD74	1	237	6	215.2	59.7			
	2	111	3					
	3	238	8					
	4	263	1					
	5	227	13					
SD75	1	238	23	238.4	13.1			
	2	257	10					
	3	220	18					
	4	239	4					
	5	238	2					

See Section 4.3 for Larval Test Suitability Determination

I = Mean Initial count (Stocking density); 307.4

N<sub>c</sub> = Mean Control Normal

N<sub>R</sub> = Mean Reference Normal

**Table 3-12. Water Quality Summary for *Mytilus galloprovincialis***

Treatment	Dissolved Oxygen (mg/L) ≥5.0 mg/L			Temperature (°C) 16± 1°C			Salinity (ppt) 28 ± 1 ppt			pH 7.5 - 9 units		
	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max	Mean	Min	Max
Control	8.0	7.9	8.2	16.7	16.5	17.0	28	28	28	7.9	7.8	8.0
CARR-REF-1	7.6	7.3	8.0	16.8	16.6	17.0	28	28	28	7.8	7.8	7.9
CARR-REF-7	7.6	7.2	7.9	17.2	16.9	<b>17.6</b>	28	28	28	7.8	7.8	7.8
SD70	7.5	6.7	8.0	16.7	16.3	17.2	28	28	28	7.9	7.9	7.9
SD71	7.8	7.5	8.0	16.6	16.4	16.7	28	28	28	7.9	7.9	8.0
SD72	8.0	7.9	8.1	16.4	16.3	16.4	28	28	28	8.0	7.9	8.0
SD73	8.0	8.0	8.0	16.7	16.5	17.0	28	28	28	7.9	7.8	8.0
SD74	7.9	7.6	8.0	16.6	16.4	16.9	28	28	28	8.0	7.9	8.0
SD75	7.6	7.4	8.0	16.9	16.5	17.4	28	28	28	7.9	7.9	7.9

**BOLD** = measurement outside of recommended range

**Table 3-13. Ammonia and Sulfide Summary for *Mytilus galloprovincialis***

Treatment	Total Ammonia (mg/L Total) NOEC = 3.14 mg/L <sup>1</sup>		Unionized Ammonia (mg/L) NOEC = 0.042 mg/L <sup>1</sup> Trigger Value = 0.04 mg/L <sup>2</sup>		Total Sulfides (mg/L Total)		Hydrogen Sulfide (mg/L) Trigger Value = 0.0025 mg/L <sup>2</sup>	
	Day 0	Final (Day 2)	Day 0	Final (Day 2)	Day 0	Final (Day 2)	Day 0	Final (Day 2)
Control	0.00	0.00	0.000	0.000	0.000	0.002	0.0000	0.0001
CARR-REF-1	0.00	0.00	0.000	0.000	0.009	0.004	0.0008	0.0004
CARR-REF-7	0.00	0.00	0.000	0.000	0.005	0.002	0.0004	0.0002
SD70	0.00	0.00	0.000	0.000	ND	ND	ND	ND
SD71	0.00	0.00	0.000	0.000	ND	0.002	ND	0.0001
SD72	0.00	0.00	0.000	0.000	ND	0.003	ND	0.0002
SD73	0.00	0.00	0.000	0.000	ND	ND	ND	ND
SD74	0.00	0.00	0.000	0.000	ND	0.002	ND	0.0001
SD75	0.00	0.00	0.000	0.000	ND	ND	ND	ND

<sup>1</sup>NOEC (concurrent reference-toxicant test derived)

<sup>2</sup>Inouye et al. 2015

ND = not detected; measurement below detection limit



**Table 3-14. Test Condition Summary for *Mytilus galloprovincialis***

<b>Test Conditions: PSEP <i>M. galloprovincialis</i></b>		
Date Sampled	November 30, 2022 (test samples) November 18, 2022 (reference sample)	
Date Received	December 1, 2022 (test samples) November 19, 2022 (reference sample)	
Test Dates	December 7 – 9, 2022	
Sample Storage Conditions	4°C, dark	
Holding Time Recommended: < 8 weeks (56 days)	7 Days (test samples) 19 Days (reference samples)	
Test Species	<i>Mytilus galloprovincialis</i>	
Supplier	Taylor Shellfish, Shelton, WA	
Date Acquired	September 20, 2022 & December 6, 2022	
Age Class	<4-h old embryos	
Test Procedures	PSEP 1995 with SMARM revisions, SCUM (WDOE 2021)	
Test Location	EcoAnalysts Port Gamble Laboratory	
Test Type/Duration	48-60 Hour static test (Actual: 48 hours)	
Control Water	North Hood Canal sea water, 0.45µm filtered	
Test Lighting	50 – 100 foot candles (14hr light: 10hr dark)	
Test Chamber	1-Liter Glass Chamber	
Replicates per Treatment	5 + 1 surrogate (used for WQ measurements throughout the test)	
Exposure Volume	18 g sediment/ 900 mL water	
Feeding	None	
Water Renewal	None	
Test Dissolved Oxygen	Recommended: >5.0 mg/L	Observed: 6.7 – 8.2 mg/L
Test Temperature	Recommended: 16 ± 1 °C	Observed: 16.3 – 17.6 °C
Test Salinity	Recommended: 28 ± 1 ppt	Observed: 28 ppt
Test pH	Recommended: 7.5 – 9	Observed: 7.8 – 8.0
Stocking Density	Recommended: 20 – 40 embryos/mL	Observed: 30.7 embryos/mL
Control Performance Standard (SMS)	Recommended: Control normal survival ≥ 0.70	Observed: 0.94
Reference Performance Standard (SMS)	Recommended: Reference normal survival relative to control ≥ 0.65	Observed: 0.79 – 0.95
Reference Toxicant Endpoint	Total Ammonia	Unionized Ammonia
Reference Toxicant EC <sub>50</sub>	7.16 mg/L	0.096 mg/L
Mean; Acceptable Range	6.57; 3.58 – 12.1 mg/L	0.140; 0.059 – 0.334 mg/L
NOEC Combined Proportion Normal	3.14 mg/L	0.042 mg/L
Deviations from Test Protocol	Temperature (Day 1, CARR-REF-7)	

## 4. DISCUSSION

Sediments were evaluated based on SMS criteria. The biological criteria are based on both statistical significance (a statistical comparison) and the degree of biological response (a numerical comparison). The SMS criteria are derived from the Washington Department of Ecology’s Sediment Cleanup User’s Manual (SCUM; WDOE 2021). Comparisons were made for each treatment against the reference sample using BioStat software. Two numerical comparisons were made under SMS: the Sediment Cleanup Objectives (SCO) and the Cleanup Screening Level (CSL).

### 4.1 Amphipod Test Suitability Determination

Under the SMS program, a treatment will fail SCO for the amphipod survival test if mean mortality in the test sediment is >25% and the difference between mean mortality in the treatment compared to mean mortality in the reference is statistically significant ( $p < 0.05$ ). Treatments fail the CSL if mean mortality in the test treatment  $\geq 30\%$  relative to the reference sediment and the difference is statistically significant.

While the mortality observed in samples SD70 and SD71 was statistically greater than their applicable reference treatments, none of the project samples had mortality >25%, and  $\geq 30\%$  relative to their reference. All project samples meet SCO and CSL criteria for the amphipod survival test Table 4-1.

Table 4-1. SMS Comparison for *Eohaustorius estuarius*

Treatment	Mean Mortality (%)	Compared To:	Mortality Statistically Greater than Reference? (P=0.05)	Mortality Comparison to Reference $M_T - M_R$ (%)	Fails SCO? <sup>1</sup>	Fails CSL? <sup>2</sup>
CARR-REF-1	9					
CARR-REF-7	1					
SD70	9	CARR-REF-7	Yes	8	No	No
SD71	8	CARR-REF-7	Yes	7	No	No
SD72	18	CARR-REF-1	No	9	No	No
SD73	7	CARR-REF-7	No	6	No	No
SD74	13	CARR-REF-1	No	4	No	No
SD75	9	CARR-REF-1	No	0	No	No

<sup>1</sup>SCO: Statistical Significance and  $M_T > 25\%$

<sup>2</sup>CSL: Statistical Significance and  $M_T - M_R \geq 30\%$

$M_T$  = Treatment Mortality

$M_R$  = Reference Mortality

### 4.2 Juvenile Polychaete Test Suitability Determination

Suitability determinations for the juvenile polychaete test were based on MIG as AFDW. A test treatment fails SCO criteria if MIG is statistically lower in the test treatment, relative to the reference, and the ratio of the MIG in the test treatment is <0.70 that of the reference. The treatments will fail CSL criteria if the MIG is significantly lower than the reference treatment and the ratio between the MIG of the treatment and the MIG of the reference is <0.50.

There was not a significant difference in growth between any of the project sediments and the applicable reference treatment with the exception of SD75 (Table 4-2). The ratio of MIG between the project sediments and that of the reference was above the SCO and CSL thresholds for all samples. All project samples meet SCO and CSL criteria for the juvenile polychaete growth test.

**Table 4-2. SMS Comparison for *Neanthes arenaceodentata***

Treatment	MIG (mg/ind/day) AFDW	Comparison To:	Growth Statistically Less than Reference? (p=0.05)	MIG Relative to Reference MIG <sub>T</sub> /MIG <sub>R</sub>	Fails SCO? <sup>1</sup>	Fails CSL? <sup>2</sup>
CARR-REF-1	1.586					
CARR-REF-7	1.267					
SD70	1.433	CARR-REF-7	No	1.13	No	No
SD71	1.609	CARR-REF-7	No	1.27	No	No
SD72	1.299	CARR-REF-1	No	0.82	No	No
SD73	1.238	CARR-REF-7	No	0.98	No	No
SD74	1.182	CARR-REF-1	No	0.75	No	No
SD75	1.401	CARR-REF-1	Yes	0.88	No	No

<sup>1</sup>SCO: Statistical Significance and MIG<sub>T</sub>/MIG<sub>R</sub> < 0.70

<sup>2</sup>CSL: Statistical Significance and MIG<sub>T</sub>/MIG<sub>R</sub> < 0.50

MIG<sub>T</sub> = Treatment Mean Individual Growth Rate

MIG<sub>R</sub> = Reference Mean Individual Growth Rate

### 4.3 Larval Test Suitability Determination

Larval test treatments fail SCO criteria if the number of normal larvae in the test treatment is significantly lower ( $p < 0.10$ ) than that of the reference and if the ratio between the normal larval development in the test treatment is less than 0.85 of the normal development in the reference. Treatments fail CSL criteria if the number of normal larvae in the test treatment is significantly lower ( $p < 0.10$ ) than that of the reference and if the ratio between the normal larval development in the test treatment is less than 0.70 of the normal development in the reference.

Larval normality was not statistically less than that of the applicable reference treatment for any of the project samples apart from sample SD73. However, the ratio of normal larvae in the project samples to that of the reference treatment was not below the SCO and CSL thresholds.

All project sediments pass the SCO and CSL criteria for the sediment larval test as shown in Table 4-3.

Table 4-3. SMS Comparison for *Mytilus galloprovincialis*

Treatment	Mean Number Normal	Compared To:	Normality Statistically Less than Reference? (p=0.10)	Normal Survival to Reference N <sub>T</sub> /N <sub>R</sub>	Fails SCO? <sup>1</sup>	Fails CSL? <sup>2</sup>
CARR-REF-1	229.4					
CARR-REF-7	274.4					
SD70	271.0	CARR-REF-7	No	0.99	No	No
SD71	255.0	CARR-REF-7	No	0.93	No	No
SD72	262.6	CARR-REF-1	No	1.14	No	No
SD73	236.0	CARR-REF-7	No	0.86	No	No
SD74	215.2	CARR-REF-1	No	0.94	No	No
SD75	238.4	CARR-REF-1	No	1.04	No	No

<sup>1</sup> SCO: Statistical Significance and (N<sub>T</sub>/N<sub>R</sub>) <0.85

<sup>2</sup> CSL: Statistical Significance and (N<sub>T</sub>/N<sub>R</sub>) <0.70

N<sub>T</sub> =Treatment Mean Number Normal

N<sub>R</sub> =Reference Mean Number Normal

## 5. SUMMARY

A summary of the biological tests conducted on the sediments evaluated under the SMS sediment quality criteria (Table 5-1) are provided below. All project samples meet the SMS sediment quality criteria for SCO and CSL for all three species tested.

Table 5-1. Summary of SMS Evaluation

Treatment	Sediment Cleanup Objectives			Cleanup Screening Levels		
	Amphipod	Polychaete	Larval	Amphipod	Polychaete	Larval
SD70	Pass	Pass	Pass	Pass	Pass	Pass
SD71	Pass	Pass	Pass	Pass	Pass	Pass
SD72	Pass	Pass	Pass	Pass	Pass	Pass
SD73	Pass	Pass	Pass	Pass	Pass	Pass
SD74	Pass	Pass	Pass	Pass	Pass	Pass
SD75	Pass	Pass	Pass	Pass	Pass	Pass

## 6. REFERENCES

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**APPENDIX A. TEST DATA, STATISTICAL ANALYSES, AND REFERENCE TOXICANT TEST RESULTS**

**1. *EOHAUSTORIUS ESTUARIUS* 10-DAY TEST**

- 1.1 *EOHAUSTORIUS ESTUARIUS* TEST DATA
- 1.2 *EOHAUSTORIUS ESTUARIUS* STATISTICAL RESULTS
- 1.3 *EOHAUSTORIUS ESTUARIUS* REFERENCE TOXICANT TEST RESULTS

**2. *NEANTHES ARENACEODENTATA* 20-DAY SOLID-PHASE TEST**

- 2.1 *NEANTHES ARENACEODENTATA* TEST DATA
- 2.2 *NEANTHES ARENACEODENTATA* STATISTICAL RESULTS
- 2.3 *NEANTHES ARENACEODENTATA* REFERENCE TOXICANT TEST RESULTS

**3. *MYTILUS GALLOPROVINCIALIS* WATER-COLUMN TEST**

- 3.1 *MYTILUS GALLOPROVINCIALIS* TEST DATA
- 3.2 *MYTILUS GALLOPROVINCIALIS* STATISTICAL RESULTS
- 3.3 *MYTILUS GALLOPROVINCIALIS* REFERENCE TOXICANT TEST RESULTS

**APPENDIX B. CHAIN-OF-CUSTODY FORMS, LOGS, AND PRE-TEST DOCUMENTS**

**APPENDIX A. TEST DATA, STATISTICAL ANALYSES, AND REFERENCE  
TOXICANT TEST RESULTS**



**1. *Eohaustorius estuarius* 10-day Test**

**1.1** *Eohaustorius estuarius* Test Data

**GENERAL**

<b>Client</b>	Pioneer
<b>Project</b>	Olympia Site
<b>Project Number</b>	PG1661
<b>Project Manager</b>	M. Knowlen
<b>Date Oldest Sample Collected</b>	11/18/2022
<b>Sample Holding Time</b>	25
<b>Test Start Date</b>	12/13/22
<b>Test Species</b>	<i>Eohaustorius estuarius</i>
<b>Organism Supplier</b>	NW Amphipod
<b>Organism Acquired</b>	12/7/2022
<b>Organism Acclimation</b>	6
<b>Organism Age</b>	Mature, 3-5mm
<b>Test Type/Duration</b>	10 d
<b>Test Protocol</b>	PSEP 1995
<b>Regional Protocol</b>	SCUM 2021
<b>Laboratory Location</b>	Port Gamble
<b>Test Location</b>	Bath 5
<b>Sample Treatment</b>	Test samples sieved 4mm, CARR-REF-7 sieved 2mm
<b>Control Sediment Source</b>	Yaquina Bay, OR
<b>Water Batch</b>	FSW121222.01
<b>Test Lighting</b>	Continuous
<b>Test Chamber</b>	1 L mason jars
<b>Replicates Per Treatment</b>	5
<b>Organisms per Replicate</b>	20
<b>Exposure Volume</b>	2 cm sediment/ 775 mL water
<b>Feeding Information</b>	None
<b>Test Dissolved Oxygen</b>	> 5.1
<b>Test Temperature</b>	15 ± 1
<b>Test Salinity</b>	28 ± 1
<b>Test pH</b>	8 ± 1
<b>Water Renewal Info</b>	None

Note: input lowest and highest decimal for temp

Test Parameters		
	Min	Max
<b>DO:</b>	5.1	
<b>Temp:</b>	14	16
<b>Sal:</b>	27	29
<b>pH:</b>	7	9

<b>TEST START TIME:</b>	<b>1525</b>
<b>TEST END TIME:</b>	<b>1300</b>

	CLIENT SAMPLE ID	LAB ID
1	Control	P221207.02
2	CARR-REF-1	P221119.02
3	CARR-REF-7	P221119.08
4	SD-70	P221201.03
5	SD-71	P221201.04
6	SD-72	P221201.05
7	SD-73	P221201.06
8	SD-74	P221201.07
9	SD-75	P221201.08
10	.	.
11	.	.
12	.	.
13	.	.
14	.	.
15	.	.
16	.	.
17	.	.
18	.	.
19	.	.
20	.	.

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double-sided printing.

### 10 DAY SP WQ DATA SHEET

CLIENT				PROJECT			SPECIES		LOCATION		PROTOCOL	
Pioneer				Olympia Site			<i>Eohaustorius estuarius</i>		Port Gamble / Bath 5		PSEP 1995 , SCUM 2021	
PROJECT NUMBER				TEST TYPE/DURATION			WATER DESCRIPTION		TEST START DATE		TEST END DATE	
PG1661				10 d			FSW121222.01		December 13, 2022		December 23, 2022	
WATER QUALITY DATA												
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes	
							> 5.1	14 - 16	27 - 29	7 - 9		
Control	0	Surr	13	MS	12/13/22	8/T16	8.2	15.3	28	8.0		
Control	1	Surr	13	LG	12/14/22	7	8.3	15.8	28	8.0		
Control	2	Surr	13	MK	12/15/22	9	8.2	15.9	28	8.0		
Control	3	Surr	13	MK	12/16/22	7	8.4	15.7	28	8.1		
Control	4	Surr	13	MK	12/17/22	8	8.2	16.1	28	8.1		
Control	5	Surr	13	LG	12/18/22	8	8.2	15.6	28	8.1		
Control	6	Surr	13	LG	12/19/22	8	8.3	15.4	28	8.0		
Control	7	Surr	13	MS	12/20/22	7	8.3	15.4	28	8.1		
Control	8	Surr	13	SZ	12/21/22	9	8.3	14.8	28	8.0		
Control	9	Surr	13	SZ	12/22/22	7	8.5	15.0	28	8.0		
Control	10	Surr	13	MK	12/23/22	8	8.0	15.1	28	7.9		
CARR-REF-1	0	Surr	23	MS	12/13/22	8/T16	8.1	15.2	28	8.0		
CARR-REF-1	1	Surr	23	LG	12/14/22	7	8.2	15.8	28	8.0		
CARR-REF-1	2	Surr	23	MK	12/15/22	9	8.2	15.9	28	8.1		
CARR-REF-1	3	Surr	23	MK	12/16/22	7	8.3	16.0	28	8.1		
CARR-REF-1	4	Surr	23	MK	12/17/22	8	8.2	16.2	28	8.1		
CARR-REF-1	5	Surr	23	LG	12/18/22	8	7.9	16.2	29	8.1		
CARR-REF-1	6	Surr	23	LG	12/19/22	8	8.3	15.4	28	8.0		
CARR-REF-1	7	Surr	23	MS	12/20/22	7	8.2	15.6	28	8.1		
CARR-REF-1	8	Surr	23	SZ	12/21/22	9	7.8	14.8	28	8.1		
CARR-REF-1	9	Surr	23	SZ	12/22/22	7	8.3	14.9	28	8.1		
CARR-REF-1	10	Surr	23	MK	12/23/22	8	8.0	14.7	28	8.0		

### 10 DAY SP WQ DATA SHEET

<b>CLIENT</b> Pioneer				<b>PROJECT</b> Olympia Site			<b>SPECIES</b> <i>Eohaustorius estuarius</i>		<b>LOCATION</b> Port Gamble / Bath 5		<b>PROTOCOL</b> PSEP 1995 , SCUM 2021	
<b>PROJECT NUMBER</b> PG1661				<b>TEST TYPE/DURATION</b> 10 d			<b>WATER DESCRIPTION</b> FSW121222.01		<b>TEST START DATE</b> December 13, 2022		<b>TEST END DATE</b> December 23, 2022	
WATER QUALITY DATA												
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes	
							> 5.1	14 - 16	27 - 29	7 - 9		
CARR-REF-7	0	Surr	17	MS	12/13/22	8/T16	8.1	15.7	28	8.0		
CARR-REF-7	1	Surr	17	LG	12/14/22	7	8.2	15.7	28	8.1		
CARR-REF-7	2	Surr	17	MK	12/15/22	9	8.1	15.8	28	8.1		
CARR-REF-7	3	Surr	17	MK	12/16/22	7	8.3	15.8	28	8.1		
CARR-REF-7	4	Surr	17	MK	12/17/22	8	8.1	16.1	28	8.1		
CARR-REF-7	5	Surr	17	LG	12/18/22	8	8.1	15.7	29	8.2		
CARR-REF-7	6	Surr	17	LG	12/19/22	8	8.3	15.4	28	8.1		
CARR-REF-7	7	Surr	17	MS	12/20/22	7	8.1	15.2	28	8.2		
CARR-REF-7	8	Surr	17	SZ	12/21/22	9	8.2	14.8	29	8.2		
CARR-REF-7	9	Surr	17	SZ	12/22/22	7	8.6	14.8	28	8.2		
CARR-REF-7	10	Surr	17	MK	12/23/22	8	8.2	14.7	28	8.2		
SD-70	0	Surr	15	MS	12/13/22	8/T16	8.2	15.5	28	8.0		
SD-70	1	Surr	15	LG	12/14/22	7	8.3	15.7	28	8.0		
SD-70	2	Surr	15	MK	12/15/22	9	8.2	15.6	28	8.0		
SD-70	3	Surr	15	MK	12/16/22	7	8.4	15.7	28	8.0		
SD-70	4	Surr	15	MK	12/17/22	8	8.3	15.8	28	8.0		
SD-70	5	Surr	15	LG	12/18/22	8	7.9	15.7	28	8.1		
SD-70	6	Surr	15	LG	12/19/22	8	8.1	15.4	28	8.1		
SD-70	7	Surr	15	MS	12/20/22	7	7.9	15.5	28	8.2		
SD-70	8	Surr	15	SZ	12/21/22	9	8.1	14.7	28	8.4		
SD-70	9	Surr	15	SZ	12/22/22	7	8.4	14.8	28	8.5		
SD-70	10	Surr	15	MK	12/23/22	8	8.0	14.7	28	8.5		

### 10 DAY SP WQ DATA SHEET

CLIENT				PROJECT			SPECIES		LOCATION		PROTOCOL	
Pioneer				Olympia Site			<i>Eohaustorius estuarius</i>		Port Gamble / Bath 5		PSEP 1995 , SCUM 2021	
PROJECT NUMBER				TEST TYPE/DURATION			WATER DESCRIPTION		TEST START DATE		TEST END DATE	
PG1661				10 d			FSW121222.01		December 13, 2022		December 23, 2022	
WATER QUALITY DATA												
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes	
							> 5.1	14 - 16	27 - 29	7 - 9		
SD-71	0	Surr	33	MS	12/13/22	8/T16	8.1	15.1	28	8.0		
SD-71	1	Surr	33	LG	12/14/22	7	8.2	15.8	28	8.0		
SD-71	2	Surr	33	MK	12/15/22	9	8.2	15.9	28	8.0		
SD-71	3	Surr	33	MK	12/16/22	7	8.2	15.9	28	8.0		
SD-71	4	Surr	33	MK	12/17/22	8	8.2	15.8	27	8.0		
SD-71	5	Surr	33	LG	12/18/22	8	8.0	15.5	28	8.1		
SD-71	6	Surr	33	LG	12/19/22	8	8.3	15.2	28	8.2		
SD-71	7	Surr	33	MS	12/20/22	7	8.1	15.2	28	8.3		
SD-71	8	Surr	33	SZ	12/21/22	9	8.2	14.9	28	8.4		
SD-71	9	Surr	33	SZ	12/22/22	7	8.3	15.0	28	8.4		
SD-71	10	Surr	33	MK	12/23/22	8	7.9	14.9	28	8.5		
SD-72	0	Surr	9	MS	12/13/22	8/T16	8.1	15.7	28	8.0		
SD-72	1	Surr	9	LG	12/14/22	7	8.1	15.9	28	8.0		
SD-72	2	Surr	9	MK	12/15/22	9	8.0	15.9	28	7.9		
SD-72	3	Surr	9	MK	12/16/22	7	8.0	16.0	28	7.9		
SD-72	4	Surr	9	MK	12/17/22	8	7.6	16.3	28	7.9		
SD-72	5	Surr	9	LG	12/18/22	8	7.7	16.1	27	8.0		
SD-72	6	Surr	9	LG	12/19/22	8	7.7	15.6	28	7.9		
SD-72	7	Surr	9	MS	12/20/22	7	8.0	16.2	28	8.1		
SD-72	8	Surr	9	SZ	12/21/22	9	8.0	14.9	28	8.1		
SD-72	9	Surr	9	SZ	12/22/22	7	8.2	14.8	28	8.2		
SD-72	10	Surr	9	MK	12/23/22	8	8.0	14.9	28	8.3		



### 10 DAY SP WQ DATA SHEET

<b>CLIENT</b> Pioneer				<b>PROJECT</b> Olympia Site			<b>SPECIES</b> <i>Eohaustorius estuarius</i>		<b>LOCATION</b> Port Gamble / Bath 5		<b>PROTOCOL</b> PSEP 1995 , SCUM 2021	
<b>PROJECT NUMBER</b> PG1661				<b>TEST TYPE/DURATION</b> 10 d			<b>WATER DESCRIPTION</b> FSW121222.01		<b>TEST START DATE</b> December 13, 2022		<b>TEST END DATE</b> December 23, 2022	
WATER QUALITY DATA												
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes	
							> 5.1	14 - 16	27 - 29	7 - 9		
SD-73	0	Surr	43	MS	12/13/22	8/T16	8.1	15.1	28	8.0		
SD-73	1	Surr	43	LG	12/14/22	7	8.4	15.6	28	8.1		
SD-73	2	Surr	43	MK	12/15/22	9	8.2	15.9	28	8.1		
SD-73	3	Surr	43	MK	12/16/22	7	8.3	15.7	28	8.0		
SD-73	4	Surr	43	MK	12/17/22	8	8.2	15.7	29	8.0		
SD-73	5	Surr	43	LG	12/18/22	8	8.2	15.2	29	8.1		
SD-73	6	Surr	43	LG	12/19/22	8	8.4	15.2	28	8.0		
SD-73	7	Surr	43	MS	12/20/22	7	8.3	15.0	28	8.1		
SD-73	8	Surr	43	SZ	12/21/22	9	8.2	14.8	29	8.0		
SD-73	9	Surr	43	SZ	12/22/22	7	8.6	15.0	28	8.1		
SD-73	10	Surr	43	MK	12/23/22	8	8.1	14.9	29	8.1		
SD-74	0	Surr	19	MS	12/13/22	8/T16	8.1	15.3	28	8.0		
SD-74	1	Surr	19	LG	12/14/22	7	8.3	15.7	28	8.0		
SD-74	2	Surr	19	MK	12/15/22	9	8.2	15.8	28	8.1		
SD-74	3	Surr	19	MK	12/16/22	7	8.3	15.8	28	8.0		
SD-74	4	Surr	19	MK	12/17/22	8	8.1	16.1	28	8.0		
SD-74	5	Surr	19	LG	12/18/22	8	8.0	15.4	28	8.1		
SD-74	6	Surr	19	LG	12/19/22	8	8.3	15.3	28	8.1		
SD-74	7	Surr	19	MS	12/20/22	7	8.2	15.3	28	8.3		
SD-74	8	Surr	19	SZ	12/21/22	9	7.8	15.0	28	8.4		
SD-74	9	Surr	19	SZ	12/22/22	7	8.4	14.8	28	8.5		
SD-74	10	Surr	19	MK	12/23/22	8	7.9	14.9	28	8.6		

### 10 DAY SP WQ DATA SHEET

<b>CLIENT</b> Pioneer				<b>PROJECT</b> Olympia Site			<b>SPECIES</b> <i>Eohaustorius estuarius</i>		<b>LOCATION</b> Port Gamble / Bath 5		<b>PROTOCOL</b> PSEP 1995 , SCUM 2021	
<b>PROJECT NUMBER</b> PG1661				<b>TEST TYPE/DURATION</b> 10 d			<b>WATER DESCRIPTION</b> FSW121222.01		<b>TEST START DATE</b> December 13, 2022		<b>TEST END DATE</b> December 23, 2022	
WATER QUALITY DATA												
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes	
							> 5.1	14 - 16	27 - 29	7 - 9		
SD-75	0	Surr	28	MS	12/13/22	8/T16	8.0	15.9	28	7.9		
SD-75	1	Surr	28	LG	12/14/22	7	8.2	15.9	28	8.0		
SD-75	2	Surr	28	MK	12/15/22	9	8.1	15.9	28	8.0		
SD-75	3	Surr	28	MK	12/16/22	7	8.2	15.8	28	8.0		
SD-75	4	Surr	28	MK	12/17/22	8	8.0	15.9	28	8.0		
SD-75	5	Surr	28	LG	12/18/22	8	7.9	15.6	28	8.0		
SD-75	6	Surr	28	LG	12/19/22	8	8.1	15.1	28	8.0		
SD-75	7	Surr	28	MS	12/20/22	7	7.2	15.8	28	8.1		
SD-75	8	Surr	28	SZ	12/21/22	9	8.4	14.9	28	8.1		
SD-75	9	Surr	28	SZ	12/22/22	7	8.3	15.0	28	8.1		
SD-75	10	Surr	28	MK	12/23/22	8	8.1	15.4	28	8.2		

**10-DAY SP TEST OBSERVATION DATA SHEET**

CLIENT				PROJECT		PROJECT NO.	PROJECT MANAGER		LOCATION		PROTOCOL		SPECIES		Comments
Pioneer				Olympia Site		PG1661	M. Knowlen		Port Gamble / Bath 5		PSEP 1995		<i>Eohaustorius estuarius</i>		
<b>Observation Key</b> #FOS = Num Floating on Water Surface #E = Num Emerged from Sediment #M = Number of Mortalities or Molts L = Anoxic Surface G = Growth D = No Air Flow (Measure DO) N = Normal TC = Too Cloudy to Observe				ENDPOINT DATA & OBSERVATIONS											
				Technician	LG	MK	MK	MK	LG	LG	MS	SZ	SZ	MK	
Day	Date	12/14/22	12/15/22	12/16/22	12/17/22	12/18/22	12/19/22	12/20/22	12/21/22	12/22/22	12/23/22				
CLIENT ID	REP	Jar #	Initial #	Day	1	2	3	4	5	6	7	8	9	10	Comments
Control	1	30	20		N	N	N	N	N	N	N	N	N	N	
Control	2	40	20		N	N	N	N	N	N	N	N	N	N	
Control	3	53	20		N	N	N	N	N	N	N	N	N	N	
Control	4	37	20		N	N	N	N	N	N	N	N	N	N	
Control	5	31	20		N	N	N	N	N	N	N	N	N	N	
CARR-REF-1	1	7	20		N	N	N	N	N	1FOS	N	N	N	N	
CARR-REF-1	2	35	20		2FOS	1FOS	N	N	N	N	N	1FOS	N	N	
CARR-REF-1	3	10	20		N	N	N	N	N	N	N	N	1FOS	N	
CARR-REF-1	4	36	20		N	N	N	N	N	N	N	N	N	N	
CARR-REF-1	5	6	20		N	N	N	N	N	N	N	N	N	N	
CARR-REF-7	1	41	20		N	N	N	N	N	N	N	N	N	N	
CARR-REF-7	2	8	20		N	N	N	N	N	N	N	N	N	N	
CARR-REF-7	3	52	20		N	N	N	N	N	N	1FOS	N	N	N	
CARR-REF-7	4	48	20		N	N	N	N	N	N	N	N	N	N	
CARR-REF-7	5	14	20		N	N	N	N	N	N	N	N	N	N	

10-DAY SP TEST OBSERVATION DATA SHEET

CLIENT				PROJECT		PROJECT NO.	PROJECT MANAGER		LOCATION		PROTOCOL		SPECIES		Comments
Pioneer				Olympia Site		PG1661	M. Knowlen		Port Gamble / Bath 5		PSEP 1995		<i>Eohaustorius estuarius</i>		
<b>Observation Key</b> #FOS = Num Floating on Water Surface #E = Num Emerged from Sediment #M = Number of Mortalities or Molts L = Anoxic Surface G = Growth D = No Air Flow (Measure DO) N = Normal TC = Too Cloudy to Observe				ENDPOINT DATA & OBSERVATIONS											
				Technician	LG	MK	MK	MK	LG	LG	MS	SZ	SZ	MK	
Date	12/14/22	12/15/22	12/16/22	12/17/22	12/18/22	12/19/22	12/20/22	12/21/22	12/22/22	12/23/22					
CLIENT ID	REP	Jar #	Initial #	Day	1	2	3	4	5	6	7	8	9	10	
SD-70	1	3	20		N	1FOS	N	1FOS	2FOS	1FOS	N	3FOS	N	N	
SD-70	2	38	20		N	N	1FOS	N	N	2FOS	1FOS	1FOS	N	5FOS	
SD-70	3	25	20		2FOS	N	1FOS	1E	2FOS	N	1FOS	2FOS	N	N	
SD-70	4	26	20		N	1FOS	N	N	1FOS	2FOS	N	N	N	N	
SD-70	5	22	20		N	N	N	N	N	1FOS	N	1FOS	N	N	
SD-71	1	4	20		N	1FOS	N	N	N	N	1FOS	N	N	N	
SD-71	2	32	20		2FOS	2FOS	4FOS	1FOS	4FOS	N	N	N	N	N	
SD-71	3	11	20		2FOS	N	N	N	N	N	N	N	N	N	
SD-71	4	42	20		N	N	N	N	N	N	N	N	N	N	
SD-71	5	21	20		N	N	N	N	1E	N	N	N	N	N	
SD-72	1	20	20		1FOS	N	1FOS	N	N	N	1FOS	N	1FOS	N	
SD-72	2	39	20		1FOS	1FOS	2FOS	1FOS	1FOS	N	2FOS	1FOS	1FOS	N	
SD-72	3	1	20		3FOS	2FOS	2FOS	2FOS	N	1FOS	3FOS	N	1E	N	
SD-72	4	47	20		1FOS	N	N	N	N	N	2FOS	N	N	N	
SD-72	5	50	20		N	N	N	N	N	N	N	N	N	N	

**10-DAY SP TEST OBSERVATION DATA SHEET**

CLIENT				PROJECT		PROJECT NO.	PROJECT MANAGER		LOCATION		PROTOCOL		SPECIES		Comments
Pioneer				Olympia Site		PG1661	M. Knowlen		Port Gamble / Bath 5		PSEP 1995		<i>Eohaustorius estuarius</i>		
<b>Observation Key</b> #FOS = Num Floating on Water Surface #E = Num Emerged from Sediment #M = Number of Mortalities or Molts L = Anoxic Surface G = Growth D = No Air Flow (Measure DO) N = Normal TC = Too Cloudy to Observe				ENDPOINT DATA & OBSERVATIONS											
				Technician	LG	MK	MK	MK	LG	LG	MS	SZ	SZ	MK	
Day	Date	12/14/22	12/15/22	12/16/22	12/17/22	12/18/22	12/19/22	12/20/22	12/21/22	12/22/22	12/23/22				
CLIENT ID	REP	Jar #	Initial #	Day	1	2	3	4	5	6	7	8	9	10	Comments
SD-73	1	49	20		N	N	1FOS	N	2FOS	1FOS	N	1FOS	N	N	
SD-73	2	16	20		N	N	N	N	N	1FOS	1FOS	N	N	N	
SD-73	3	45	20		1FOS	N	N	N	N	N	2FOS	N	N	N	
SD-73	4	34	20		1FOS	1FOS	N	1FOS	2FOS	1FOS	2FOS	1FOS	N	N	
SD-73	5	44	20		N	N	N	N	N	N	N	1FOS	N	N	
SD-74	1	27	20		N	N	N	N	1FOS	N	N	N	2FOS	N	
SD-74	2	54	20		N	N	N	N	N	1FOS	1FOS	N	N	N	
SD-74	3	29	20		N	N	N	N	1FOS	N	N	N	N	N	
SD-74	4	51	20		N	1FOS	1FOS	1FOS	N	N	1FOS	N	N	1FOS	
SD-74	5	12	20		1E	N	N	N	N	N	1FOS	N	N	N	
SD-75	1	18	20		N	N	N	N	1FOS	N	N	N	N	N	
SD-75	2	24	20		N	N	N	N	N	N	N	N	N	N	
SD-75	3	2	20		2FOS	1FOS	N	N	1FOS	N	N	N	N	N	
SD-75	4	5	20		N	N	1FOS	N	N	N	1FOS	N	N	N	
SD-75	5	46	20		1FOS	2FOS	1FOS	1FOS	2FOS	1FOS	1FOS	N	3E	N	

CLIENT		PROJECT		PROJECT NUMBER				Comments
Pioneer		Olympia Site		PG1661				
PROJECT MANAGER		SPECIES						
M. Knowlen		<i>Eohaustorius estuarius</i>						
Sample ID	Rep	Jar #	# Initiated	Date Recovered:		12/23/2022		
				# Alive	# Dead	Initials	# Missing or Dead	
Control	1	30	20	20	0	MK	0	
Control	2	40	20	20	0	MK	0	
Control	3	53	20	20	0	MK	0	
Control	4	37	20	20	0	MK	0	
Control	5	31	20	19	0	MK	1	
CARR-REF-1	1	7	20	19	1	MK	1	
CARR-REF-1	2	35	20	19	0	MK	1	
CARR-REF-1	3	10	20	16	2	MK	4	
CARR-REF-1	4	36	20	19	1	MK	1	
CARR-REF-1	5	6	20	18	0	MK	2	
CARR-REF-7	1	41	20	20	0	MK	0	
CARR-REF-7	2	8	20	19	0	MK	1	
CARR-REF-7	3	52	20	20	0	MK	0	
CARR-REF-7	4	48	20	20	0	MK	0	
CARR-REF-7	5	14	20	20	0	MK	0	
SD-70	1	3	20	18	0	MK	2	
SD-70	2	38	20	18	0	MK	2	
SD-70	3	25	20	17	1	MK	3	
SD-70	4	26	20	19	0	MK	1	
SD-70	5	22	20	19	0	MK	1	
SD-71	1	4	20	17	0	MK	3	
SD-71	2	32	20	19	0	MK	1	
SD-71	3	11	20	18	0	MK	2	
SD-71	4	42	20	18	0	MK	2	
SD-71	5	21	20	20	0	MK	0	
SD-72	1	20	20	15	1	MK	5	
SD-72	2	39	20	17	1	MK	3	
SD-72	3	1	20	12	1	MK	8	
SD-72	4	47	20	20	0	MK	0	
SD-72	5	50	20	18	1	MK	2	

CLIENT		PROJECT		PROJECT NUMBER				Comments
Pioneer		Olympia Site		PG1661				
PROJECT MANAGER		SPECIES						
M. Knowlen		<i>Eohaustorius estuarius</i>						
Sample ID	Rep	Jar #	# Initiated	Date Recovered:		12/23/2022		
				# Alive	# Dead	Initials	# Missing or Dead	
SD-73	1	49	20	20	0	MK	0	
SD-73	2	16	20	20	0	MK	0	
SD-73	3	45	20	17	0	MK	3	
SD-73	4	34	20	19	0	MK	1	
SD-73	5	44	20	17	1	MK	3	
SD-74	1	27	20	16	0	MK	4	
SD-74	2	54	20	19	0	MK	1	
SD-74	3	29	20	19	0	MK	1	
SD-74	4	51	20	15	1	MK	5	
SD-74	5	12	20	18	0	MK	2	
SD-75	1	18	20	20	0	MK	0	
SD-75	2	24	20	18	0	MK	2	
SD-75	3	2	20	17	0	MK	3	
SD-75	4	5	20	18	0	MK	2	
SD-75	5	46	20	18	0	MK	2	



CLIENT		PROJECT			PROJECT NUMBER		SPECIES		
Pioneer		Olympia Site			PG1661		<i>Eohaustorius estuarius</i>		
Sample ID	Rep	# Initiated	# Alive	Survival Statistics			Mortality Statistics		
				% Survival	Mean Survival (%)	SD	% Mortality	Mean Mortality (%)	SD
Control	1	20	20	100			0		
Control	2	20	20	100			0		
Control	3	20	20	100			0		
Control	4	20	20	100			0		
Control	5	20	19	95	99.0	2.2	5	1.0	2.2
CARR-REF-1	1	20	19	95			5		
CARR-REF-1	2	20	19	95			5		
CARR-REF-1	3	20	16	80			20		
CARR-REF-1	4	20	19	95			5		
CARR-REF-1	5	20	18	90	91.0	6.5	10	9.0	6.5
CARR-REF-7	1	20	20	100			0		
CARR-REF-7	2	20	19	95			5		
CARR-REF-7	3	20	20	100			0		
CARR-REF-7	4	20	20	100			0		
CARR-REF-7	5	20	20	100	99.0	2.2	0	1.0	2.2
SD-70	1	20	18	90			10		
SD-70	2	20	18	90			10		
SD-70	3	20	17	85			15		
SD-70	4	20	19	95			5		
SD-70	5	20	19	95	91.0	4.2	5	9.0	4.2
SD-71	1	20	17	85			15		
SD-71	2	20	19	95			5		
SD-71	3	20	18	90			10		
SD-71	4	20	18	90			10		
SD-71	5	20	20	100	92.0	5.7	0	8.0	5.7
SD-72	1	20	15	75			25		
SD-72	2	20	17	85			15		
SD-72	3	20	12	60			40		
SD-72	4	20	20	100			0		
SD-72	5	20	18	90	82.0	15.2	10	18.0	15.2
SD-73	1	20	20	100			0		
SD-73	2	20	20	100			0		
SD-73	3	20	17	85			15		
SD-73	4	20	19	95			5		
SD-73	5	20	17	85	93.0	7.6	15	7.0	7.6
SD-74	1	20	16	80			20		
SD-74	2	20	19	95			5		
SD-74	3	20	19	95			5		
SD-74	4	20	15	75			25		
SD-74	5	20	18	90	87.0	9.1	10	13.0	9.1
SD-75	1	20	20	100			0		
SD-75	2	20	18	90			10		
SD-75	3	20	17	85			15		
SD-75	4	20	18	90			10		
SD-75	5	20	18	90	91.0	5.5	10	9.0	5.5

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double-sided printing.

### 10 Day SP Test Day 0 Overlying Ammonia

CLIENT			PROJECT				PROJECT NUMBER				SPECIES						
Pioneer			Olympia Site				PG1661				Eohaustorius estuarius						
Calibration Standards Temperature: 20.1			Date: 12/13/2022		Tech: MS		Ammonia Meter: 10		Sulfide Meter: Spec.1								
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																	
Sample	Day	Overlying/ Porewater	measured				calculated				NH <sub>3</sub> pKa <sup>s</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa <sup>s</sup> *	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes		
			Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Total Dissolved Sulfide (µg/L as S)	Test salinity (ppt)						Test pH	Test temp (C)
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Record	Record	Sourced	Sourced	Sourced	Calculated	Calculated	Calculated	Calculated
Control	0	Overlying	0.00	20.8	T17	ND	10	1	ND	28	8.0	15.3	288.45	9.26	0.000	6.67	ND
CARR-REF-1	0	Overlying	1.26	20.3	T17	ND	10	1	ND	28	8.0	15.2	288.35	9.26	0.033	6.68	ND
CARR-REF-7	0	Overlying	1.31	20.9	T17	ND	10	1	ND	28	8.0	15.7	288.85	9.26	0.036	6.67	ND
SD-70	0	Overlying	1.07	20.7	T17	4	10	1	4	28	8.0	15.5	288.65	9.26	0.029	6.67	0.248
SD-71	0	Overlying	0.682	20.2	T17	ND	10	1	ND	28	8.0	15.1	288.25	9.26	0.018	6.68	ND
SD-72	0	Overlying	0.438	19.5	T17	0	10	1	0	28	8.0	15.7	288.85	9.26	0.012	6.67	0.000
SD-73	0	Overlying	0.383	19.6	T17	4	10	1	4	28	8.0	15.1	288.25	9.26	0.010	6.68	0.252
SD-74	0	Overlying	0.260	19.4	T17	1	10	1	1	28	8.0	15.3	288.45	9.26	0.007	6.67	0.062
SD-75	0	Overlying	0.610	19.2	T17	1	10	1	1	28	7.9	15.9	289.05	9.26	0.013	6.66	0.076

### 10 Day SP Test Day 0 Porewater Ammonia

CLIENT Pioneer			PROJECT Olympia Site				PROJECT NUMBER PG1661				SPECIES <i>Eohaustorius estuarius</i>									
Calibration Standards Temperature: 20.1			Date: 12/13/2022		Tech: MS		Ammonia Meter: 10		Sulfide Mete		Spec. 1									
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																				
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p style="text-align: center;"><i>Measured</i></p> <p style="text-align: center;"><b>Total</b></p> </div> <div style="width: 45%;"> <p style="text-align: center;"><i>Calculated</i></p> <p style="text-align: center;"><b>Total</b></p> </div> </div>																				
Sample	Day	Overlying/ Porewater	Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Dissolved Sulfide (µg/L as S)	Porewater salinity (ppt)	Porewater pH	Test temp (C)	Temp (K)	Unionized NH <sub>3</sub> (mg/L)	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes				
<b>Sourced</b>	<b>Sourced</b>		<b>Record</b>	<b>Record</b>	<b>Record</b>	<b>Record</b>	<b>Record</b>	<b>Record</b>	<b>Calculated</b>	<b>Record</b>	<b>Record</b>	<b>Sourced</b>	<b>Calculated</b>	<b>Calculated</b>	<b>Calculated</b>	<b>Calculated</b>				
Control	0	Porewater	0.00	21.1	8/T17	16	10	1	16	28	7.3	15.3	288.45	9.26	0.000	6.67	4.005			
CARR-REF-1	0	Porewater	7.51	20.7	8/T17	10	10	1	10	29	7.5	15.2	288.35	9.26	0.064	6.67	1.739			
CARR-REF-7	0	Porewater	6.66	21.0	8/T17	1	10	1	1	30	7.5	15.7	288.85	9.26	0.058	6.66	0.170			
SD-70	0	Porewater	4.26	20.5	8/T17	44	10	1	44	29	7.6	15.5	288.65	9.26	0.046	6.67	6.239			
SD-71	0	Porewater	4.28	20.2	8/T17	55	10	1	55	29	7.6	15.1	288.25	9.26	0.045	6.67	7.905			
SD-72	0	Porewater	2.21	20.1	8/T17	ND	10	1	ND	29	7.5	15.7	288.85	9.26	0.019	6.66	ND			
SD-73	0	Porewater	1.57	20.0	8/T17	7	10	1	7	29	7.5	15.1	288.25	9.26	0.013	6.67	1.221			
SD-74	0	Porewater	1.47	20.0	8/T17	3	10	1	3	29	7.5	15.3	288.45	9.26	0.013	6.67	0.520			
SD-75	0	Porewater	2.54	19.8	8/T17	3	10	1	3	29	7.5	15.9	289.05	9.26	0.023	6.66	0.510			

### 10 Day SP Test Day 10 Overlying Ammonia

CLIENT Pioneer		PROJECT Olympia Site			PROJECT NUMBER PG1661			SPECIES <i>Eohaustorius estuarius</i>											
Calibration Standards Temperature: 20.1		Date: 12/23/2022	Tech: NL	Ammonia Meter: 10		Sulfide Meter: 1													
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																			
Sample	Day	Overlying/ Porewater	<i>measured</i>				<i>calculated</i>				Test salinity (ppt)	Test temp			NH <sub>3</sub> pKa <sup>s</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pK <sub>a</sub> <sup>*</sup>	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes
			Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Sulfide (µg/L as S)	Test pH		(C)	(K)						
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Calculated	Sourced	Sourced	Sourced	Calculated	Calculated	Calculated	Calculated	Calculated	Calculated	
Control	10	Overlying	0.000	19.1	T17	ND	10	1	ND	28	7.9	15.1	288.25	9.26	0.000	6.68	ND		
CARR-REF-1	10	Overlying	1.50	19.1	T17	ND	10	1	ND	28	8.0	14.7	287.85	9.26	0.038	6.68	ND		
CARR-REF-7	10	Overlying	4.24	19.1	T17	5	10	1	5	28	8.2	14.7	287.85	9.26	0.168	6.68	0.206		
SD-70	10	Overlying	0.928	19.1	T17	9	10	1	9	28	8.5	14.7	287.85	9.26	0.071	6.68	0.190		
SD-71	10	Overlying	0.272	19.1	T17	7	10	1	7	28	8.5	14.9	288.05	9.26	0.021	6.68	0.147		
SD-72	10	Overlying	0.000	19.1	T17	ND	10	1	ND	28	8.3	14.9	288.05	9.26	0.000	6.68	ND		
SD-73	10	Overlying	0.000	19.1	T17	ND	10	1	ND	29	8.1	14.9	288.05	9.26	0.000	6.68	ND		
SD-74	10	Overlying	0.000	19.1	T17	ND	10	1	ND	28	8.6	14.9	288.05	9.26	0.000	6.68	ND		
SD-75	10	Overlying	0.000	19.4	T17	ND	10	1	ND	28	8.2	15.4	288.55	9.26	0.000	6.67	ND		

10 Day SP Test Day 10 Porewater Ammonia

CLIENT			PROJECT			PROJECT NUMBER			SPECIES									
Pioneer			Olympia Site			PG1661			Eohaustorius estuarius									
Calibration Standards Temperature: 20.1			Date: 12/23/2022			Tech: NL			Ammonia Meter: 10			Sulfide Meter 1						
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																		
Sample	Day	Overlying/ Porewater	Measured			Calculated			Porewater salinity (ppt)	Porewater pH	Test temp (C)	Temp (K)	NH <sub>3</sub> pKa <sup>1</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pK <sub>a</sub> <sup>*</sup>	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes	
			Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier										Total Dissolved Sulfide (µg/L as S)
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Record	Record	Sourced	Calculated	Calculated	Calculated	Calculated	Calculated		
Control	10	Porewater	0.0319	19.1	T17/M9	ND	10	1	ND	28	7.6	15.1	288.25	9.26	0.000	6.68	ND	
CARR-REF-1	10	Porewater	4.80	19.2	T17/M9	2	10	1	2	29	7.7	14.7	287.85	9.26	0.062	6.68	0.239	
CARR-REF-7	10	Porewater	5.88	19.3	T17/M9	NM	NM		NM	NM	7.8	14.7	287.85	#VALUE!	#VALUE!	#VALUE!	NM	Not enough volume of PW for sulfide or salinity reading.--NL 12/23/22
SD-70	10	Porewater	4.30	19.1	T17/M9	ND	10	1	ND	29	7.7	14.7	287.85	9.26	0.055	6.68	ND	
SD-71	10	Porewater	3.21	19.3	T17/M9	2	10	1	2	29	7.5	14.9	288.05	9.26	0.027	6.68	0.351	
SD-72	10	Porewater	2.23	19.3	T17/M9	2	10	1	2	29	7.7	14.9	288.05	9.26	0.029	6.68	0.237	
SD-73	10	Porewater	2.25	19.3	T17/M9	8	10	1	8	29	7.7	14.9	288.05	9.26	0.029	6.68	0.948	
SD-74	10	Porewater	1.04	19.4	T17/M9	13	10	1	13	29	7.7	14.9	288.05	9.26	0.014	6.68	1.540	
SD-75	10	Porewater	1.01	19.3	T17/M9	ND	10	1	ND	28	7.5	15.4	288.55	9.26	0.009	6.67	ND	

## 1.2 *Eohaustorius estuarius* Statistical Results



Project Name: Olympia Site: Amphipod Mortality

Sample: x1  
 Samp ID: SD-70  
 Alias: P221201.03  
 Replicates: 5  
 Mean: 0.09  
 SD: 0.042  
 Tr Mean: N/A  
 Trans SD: N/A

Ref Samp: x2  
 Ref ID: CARR-REF-7  
 Alias: P221119.08  
 Replicates: 5  
 Mean: 0.01  
 SD: 0.022  
 Tr Mean: N/A  
 Trans SD: N/A

Shapiro-Wilk Results:	Levene's Results:	Test Results:
Residual Mean: 0 Residual SD: 0.321 SS: 1.957 K: 5 b: 1.257  Alpha Level: 0.05 Calculated Value: 0.8071 Critical Value: $\leq 0.842$  Normally Distributed: No  Override Option: Not Invoked	Test Residual Mean: 0.32 Test Residual SD: 0.182 Ref. Residual Mean: 0.41 Ref. Residual SD: 0.344 Deg. of Freedom: 8  Alpha Level: 0.1 Calculated Value: 0.5175 Critical Value: $\geq 1.860$  Variances Homogeneous: Yes	Statistic: Mann-Whitney Balanced Design: Yes Transformation: rank-order  Experimental Hypothesis Null: $x1 \leq x2$ Alternate: $x1 > x2$  Mann-Whitney N1: 5 Mann-Whitney N2: 5 Degrees of Freedom: Experimental Alpha Level: 0.05 Calculated Value: 24 Critical Value: $\geq 21.000$ Accept Null Hypothesis: No  Power: Min. Difference for Power:

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shapiro-Wilk Residuals
1	0.1	8.5	0	2.5	0.131	0.256	2.5		-0.4
2	0.1	8.5	0.05	6	0.131	1.025	2.5		-0.4
3	0.15	10	0	2.5	0.538	0.256	2.5		-0.256
4	0.05	6	0	2.5	0.4	0.256	2.5		-0.256
5	0.05	6	0	2.5	0.4	0.256	6		-0.256
6							6		-0.256
7							6		0.131
8							8.5		0.131
9							8.5		0.538
10							10		1.025











### **1.3 *Eohaustorius estuarius* Reference Toxicant Test Results**

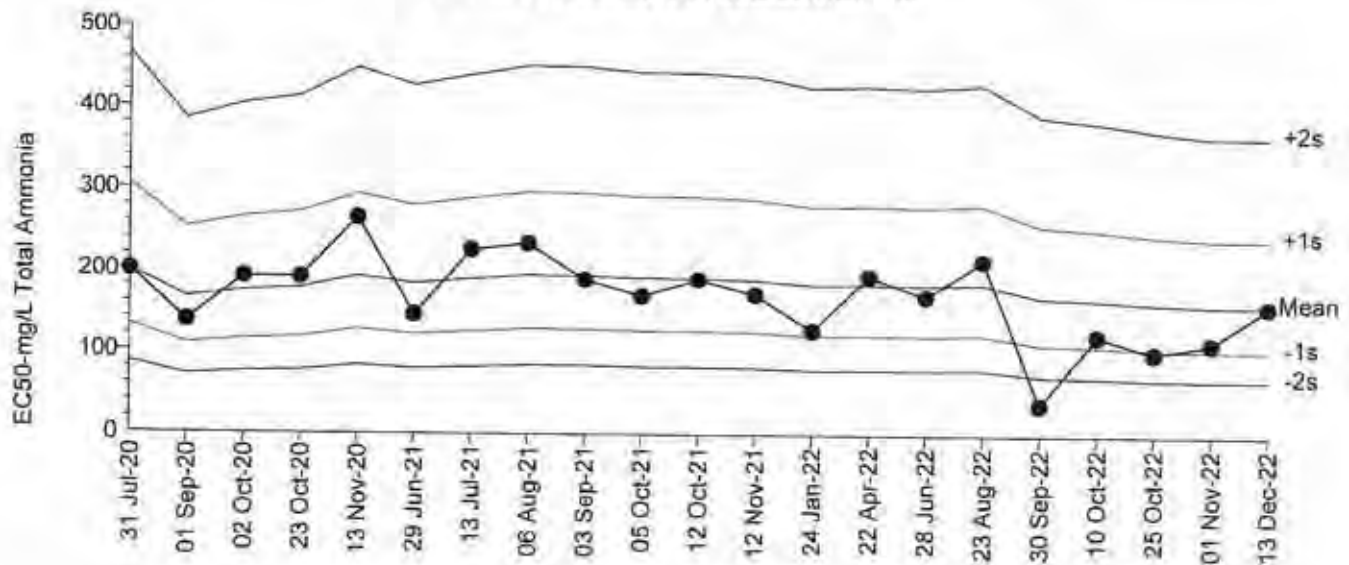


Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival Organism: Eohaustorius estuarius (Amphipod) Material: Total Ammonia  
 Protocol: All Protocols Endpoint: Proportion Survived Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test



Mean: 158.2 Count: 20 -1s Warning Limit: 103.6 -2s Action Limit: 67.9  
 Sigma: n/a CV: -44.20% +1s Warning Limit: 241.4 +2s Action Limit: 358.4

Quality Control Data

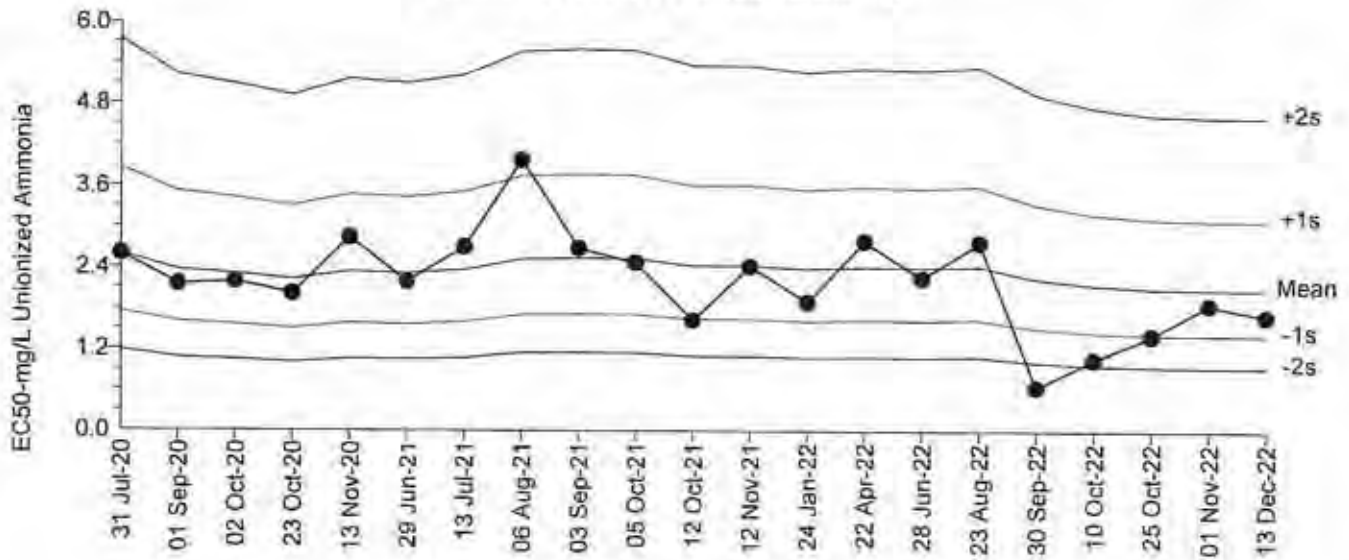
Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2020	Jul	31	13:31	200.1	41.89	0.5555			19-0166-9324	03-8578-2577	EcoAnalysts
2		Sep	1	11:50	136.2	-21.98	-0.3537			02-9531-4833	11-6890-2134	EcoAnalysts
3		Oct	2	13:55	191.4	33.2	0.4505			10-8959-5787	01-2752-4170	EcoAnalysts
4			23	10:35	190.7	32.51	0.442			09-8256-8636	12-6068-0049	EcoAnalysts
5		Nov	13	15:42	264.7	106.5	1.217	(+)		12-1804-8521	19-5275-8749	EcoAnalysts
6	2021	Jun	29	16:15	144.4	-13.82	-0.2162			07-6082-1836	05-1033-0371	EcoAnalysts
7		Jul	13	13:45	225.7	67.44	0.8398			15-1767-0094	07-8834-3646	EcoAnalysts
8		Aug	6	15:40	233.3	75.11	0.9188			13-1244-3040	10-3339-7021	EcoAnalysts
9		Sep	3	14:25	189.2	30.95	0.4226			14-2430-8410	06-3875-1883	EcoAnalysts
10		Oct	5	14:35	168.6	10.39	0.1504			05-6089-1762	07-2578-5145	EcoAnalysts
11			12	13:00	189.8	31.53	0.4298			10-1319-1221	04-3112-1590	EcoAnalysts
12		Nov	12	13:02	170.9	12.64	0.1818			16-6462-6661	07-1229-9010	EcoAnalysts
13	2022	Jan	24	13:52	126.5	-31.76	-0.5299			05-4916-3366	14-8786-8282	EcoAnalysts
14		Apr	22	15:24	194.7	36.51	0.4911			09-3215-0902	02-7504-1204	EcoAnalysts
15		Jun	28	14:55	169.4	11.18	0.1614			02-4574-4479	16-9394-6529	EcoAnalysts
16		Aug	23	15:40	214.4	56.17	0.7186			13-3970-9795	17-9108-7239	EcoAnalysts
17		Sep	30	14:50	37.97	-120.3	-3.375	(-)	(-)	13-9618-4863	18-1195-4011	EcoAnalysts
18		Oct	10	16:19	121.1	-37.1	-0.632			19-7533-0438	11-3991-1981	EcoAnalysts
19			25	14:35	100.6	-57.62	-1.071	(-)		16-9367-6643	12-8161-4083	EcoAnalysts
20		Nov	1	15:42	112	-46.2	-0.8168			18-4264-0694	03-2825-9179	EcoAnalysts
21		Dec	13	16:17	157.4	-0.7891	-0.01183			15-5018-9515	07-7176-9244	EcoAnalysts

Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival Organism: Eohaustonus estuarius (Amphipod) Material: Unionized Ammonia  
 Protocol: All Protocols Endpoint: Proportion Survived Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test



Mean: 2.097 Count: 20 -1s Warning Limit: 1.411 -2s Action Limit: 0.9499  
 Sigma: n/a CV: 41.20% +1s Warning Limit: 3.115 +2s Action Limit: 4.628

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2020	Jul	31	13:31	2.604	0.5074	0.5474			00-3001-9040	12-3550-9219	EcoAnalysts
2		Sep	1	11:50	2.15	0.05283	0.06285			20-8197-8748	01-8924-2597	EcoAnalysts
3		Oct	2	13:55	2.192	0.09563	0.1127			11-7285-1322	05-0028-0196	EcoAnalysts
4			23	10:35	2.014	-0.08321	-0.1023			06-9998-7880	19-7260-2994	EcoAnalysts
5		Nov	13	15:42	2.846	0.7491	0.7716			18-9101-0953	11-1982-6601	EcoAnalysts
6	2021	Jun	29	16:15	2.193	0.09595	0.113			19-9925-7350	18-0084-5381	EcoAnalysts
7		Jul	13	13:45	2.706	0.6095	0.6445			19-3066-6785	16-4976-7245	EcoAnalysts
8		Aug	6	15:40	3.994	1.898	1.628	(+)		10-9355-9036	08-0099-3943	EcoAnalysts
9		Sep	3	14:25	2.695	0.598	0.6338			12-5464-4660	16-4098-9472	EcoAnalysts
10		Oct	5	14:35	2.48	0.3834	0.4241			20-0347-9293	21-3801-9362	EcoAnalysts
11			12	13:00	1.626	-0.4708	-0.6423			17-3581-6892	09-4984-6983	EcoAnalysts
12		Nov	12	13:02	2.43	0.3331	0.3724			01-1118-7708	20-5660-0461	EcoAnalysts
13	2022	Jan	24	13:52	1.905	-0.1915	-0.2419			14-2913-5882	03-6600-7571	EcoAnalysts
14		Apr	22	15:24	2.802	0.7054	0.7325			09-9104-9344	15-9215-6426	EcoAnalysts
15		Jun	28	14:55	2.257	0.1599	0.1857			15-1320-8403	14-1461-4017	EcoAnalysts
16		Aug	23	15:40	2.789	0.6919	0.7203			19-4730-2098	12-6509-7347	EcoAnalysts
17		Sep	30	14:50	0.6533	-1.443	-2.945	(-)	(-)	18-5906-4045	01-7092-5166	EcoAnalysts
18		Oct	10	16:19	1.063	-1.034	-1.717	(-)		05-4844-2700	02-4603-3042	EcoAnalysts
19			25	14:35	1.408	-0.6891	-1.006	(-)		10-4360-0577	02-1954-1913	EcoAnalysts
20		Nov	1	15:42	1.868	-0.2291	-0.2922			18-6321-3380	11-1992-4810	EcoAnalysts
21		Dec	13	16:17	1.699	-0.3975	-0.5309			19-9404-3469	14-9964-9756	EcoAnalysts

# CETIS Summary Report

Report Date: 27 Dec-22 16:01 (p 1 of 1)  
 Test Code/ID: P220819.14 / 15-5018-9515

## Reference Toxicant 96-h Acute Survival Test

EcoAnalysts

Batch ID: 00-2984-0656	Test Type: Survival	Analyst:
Start Date: 13 Dec-22 16:17	Protocol: PSEP (1995)	Diluent: Laboratory Seawater
Ending Date: 17 Dec-22 14:18	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 94h	Taxon: Malacostraca	Source: Northwest Amphipod, OR Age:
Sample ID: 05-2483-6699	Code: P220819.14	Project: Reference Toxicant
Sample Date: 19 Aug-22	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 19 Aug-22	CAS (PC):	Station: P220819.14
Sample Age: 115d 16h	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
13-4749-5168	Proportion Survived	Dunnett Multiple Comparison Test	75.4	161	110.2		22.1%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg/L	95% LCL	95% UCL	TU	S
07-7176-9244	Proportion Survived	Trimmed Spearman-Kärber	EC50	157.4	133.8	185.3		1

## Proportion Survived Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
23.8		3	0.9667	0.8232	1.0000	0.9000	1.0000	0.0333	0.0577	5.97%	3.33%
42.1		3	0.9667	0.8232	1.0000	0.9000	1.0000	0.0333	0.0577	5.97%	3.33%
75.4		3	0.9000	0.9000	0.9000	0.9000	0.9000	0.0000	0.0000	0.00%	10.00%
161		3	0.5667	0.0000	1.0000	0.2000	0.8000	0.1856	0.3215	56.73%	43.33%
324		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

## Proportion Survived Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	1.0000	1.0000
23.8		0.9000	1.0000	1.0000
42.1		0.9000	1.0000	1.0000
75.4		0.9000	0.9000	0.9000
161		0.8000	0.2000	0.7000
324		0.0000	0.0000	0.0000

## Proportion Survived Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	10/10	10/10	10/10
23.8		9/10	10/10	10/10
42.1		9/10	10/10	10/10
75.4		9/10	9/10	9/10
161		8/10	2/10	7/10
324		0/10	0/10	0/10

**CETIS Test Data Worksheet**

Report Date: 27 Dec-22 16:01 (p 1 of 1)  
 Test Code/ID: P220819.14 / 15-5018-9515

<b>Reference Toxicant 96-h Acute Survival Test</b>				<b>EcoAnalysts</b>	
<b>Start Date:</b> 13 Dec-22 16:17	<b>Species:</b> Eohaustorius estuarius	<b>Sample Code:</b> P220819.14			
<b>End Date:</b> 17 Dec-22 14:18	<b>Protocol:</b> PSEP (1995)	<b>Sample Source:</b> Reference Toxicant			
<b>Sample Date:</b> 19 Aug-22	<b>Material:</b> Total Ammonia	<b>Sample Station:</b> P220819.14			

Conc-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	16	10	10	
0	D	2	13	10	10	
0	D	3	12	10	10	
23.8		1	7	10	9	
23.8		2	8	10	10	
23.8		3	15	10	10	
42.1		1	18	10	9	
42.1		2	9	10	10	
42.1		3	10	10	10	
75.4		1	1	10	9	
75.4		2	14	10	9	
75.4		3	2	10	9	
161		1	6	10	8	
161		2	3	10	2	
161		3	4	10	7	
324		1	5	10	0	
324		2	11	10	0	
324		3	17	10	0	

# CETIS Summary Report

Report Date: 27 Dec-22 16:01 (p 1 of 1)  
 Test Code/ID: P220819.14UIA / 19-9404-3469

## Reference Toxicant 96-h Acute Survival Test

EcoAnalysts

Batch ID: 00-2984-0656	Test Type: Survival	Analyst:
Start Date: 13 Dec-22 16:17	Protocol: PSEP (1995)	Diluent: Laboratory Seawater
Ending Date: 17 Dec-22 14:18	Species: Eohaustorius estuarius	Brine: Not Applicable
Test Length: 94h	Taxon: Malacostraca	Source: Northwest Amphipod, OR Age:
Sample ID: 04-2845-3768	Code: P220819.14UIA	Project: Reference Toxicant
Sample Date: 19 Aug-22	Material: Unionized Ammonia	Source: Reference Toxicant
Receipt Date: 19 Aug-22	CAS (PC):	Station: P220819.14UIA
Sample Age: 116d 16h	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
06-8097-2682	Proportion Survived	Dunnett Multiple Comparison Test	1.209	1.638	1.407		22.1%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg/L	95% LCL	95% UCL	TU	S
14-9964-9756	Proportion Survived	Trimmed Spearman-Kärber	EC50	1.699	1.546	1.867		1

## Proportion Survived Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	0.00%
0.496		3	0.9667	0.8232	1.0000	0.9000	1.0000	0.0333	0.0577	5.97%	3.33%
0.69		3	0.9667	0.8232	1.0000	0.9000	1.0000	0.0333	0.0577	5.97%	3.33%
1.209		3	0.9000	0.9000	0.9000	0.9000	0.9000	0.0000	0.0000	0.00%	10.00%
1.638		3	0.5667	0.0000	1.0000	0.2000	0.8000	0.1856	0.3215	56.73%	43.33%
2.683		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

## Proportion Survived Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	1.0000	1.0000
0.496		0.9000	1.0000	1.0000
0.69		0.9000	1.0000	1.0000
1.209		0.9000	0.9000	0.9000
1.638		0.8000	0.2000	0.7000
2.683		0.0000	0.0000	0.0000

## Proportion Survived Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	10/10	10/10	10/10
0.496		9/10	10/10	10/10
0.69		9/10	10/10	10/10
1.209		9/10	9/10	9/10
1.638		8/10	2/10	7/10
2.683		0/10	0/10	0/10

# CETIS Test Data Worksheet

Report Date: 27 Dec-22 16:01 (p 1 of 1)  
 Test Code/ID: P220819.14UIA / 19-9404-3469

## Reference Toxicant 96-h Acute Survival Test

EcoAnalysts

Start Date: 13 Dec-22 16:17 Species: Eohaustorius estuarius Sample Code: P220819.14UIA  
 End Date: 17 Dec-22 14:18 Protocol: PSEP (1995) Sample Source: Reference Toxicant  
 Sample Date: 19 Aug-22 Material: Unionized Ammonia Sample Station: P220819.14UIA

Conc-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	7	10	10	
0	D	2	13	10	10	
0	D	3	15	10	10	
0.496		1	1	10	9	
0.496		2	2	10	10	
0.496		3	14	10	10	
0.69		1	17	10	9	
0.69		2	10	10	10	
0.69		3	8	10	10	
1.209		1	6	10	9	
1.209		2	12	10	9	
1.209		3	11	10	9	
1.638		1	9	10	8	
1.638		2	18	10	2	
1.638		3	4	10	7	
2.683		1	3	10	0	
2.683		2	16	10	0	
2.683		3	5	10	0	

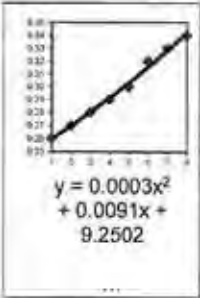


# Un-ionized Ammonia Calculator

CLIENT:	Pioneer	Date of Test:	December 13, 2022
PROJECT:	Olympia Site	Test Type:	Eoh RT
COMMENTS:	P220819.14		

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature, and pH.

Ionic strength: pKa'	
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34



Sample	Mod	NH3T (mg/L)	salinity (ppt)	pH	temp (C)	temp (K)	pKa'	NH <sub>3</sub> U (mg/L)
Target / Sample Name		Actual	Actual	Actual	Actual	Calculated	Calculated	Calculated
Example 3.5		2.000	10.0	7.5	5.0	278.15	9.2520	0.008
1								
2								
3	20	23.8	28	7.9	15.1	288.25	9.2555	0.496
4	40	42.1	28	7.8	14.9	288.05	9.2555	0.690
5	80	75.4	28	7.8	14.6	287.75	9.2555	1.209
6	160	161	29	7.6	14.6	287.75	9.2557	1.638
7	320	324	29	7.5	14.9	288.05	9.2557	2.683
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CLIENT <b>Pioneer</b>	PROJECT <b>Olympia Site</b>	<i>Eohaustorius estuarius</i>			Laboratory Port Gamble	PROTOCOL <b>PSEP</b>
TEST ID <b>P220819.14</b>	LOT #: <b>22E3156086</b>	DILUTION PREP INITIALS: <b>MS</b>				
CHAMBER SIZE/TYPE Pint Jar	EXPOSURE VOLUME 250 ml	TEST START DATE 12/13/22	INITIALS BH/MS	TIME 1617	TEST END DATE 12/17/22	TIME 1418 MK

WATER QUALITY DATA

TEST CONDITIONS				DO (mg/L)		TEMP(C)		SAL (ppt)		pH		TECHNICIAN	AMMONIA					
SAMPLE ID	CONCENTRATION		DAY	REP	D.O.		TEMP.		SALINITY		pH		WQ TECH/ DATE	AMMONIA		Tech		
	value	units			meter	mg/L	meter	°C	meter	ppt	meter	unit		METER	mg/L			
	Ref.Tox.-ammonia	0			mg/L	0	Stock	8	7.9	8 <sup>Ⓛ</sup>	14.9	8		28	8		7.9	MS 12/13
			4	1	8	7.3	8	15.8	8	28	8	7.8	MK 12/17					
Ref.Tox.-ammonia	20	mg/L	0	Stock	8	7.9	8 <sup>Ⓛ</sup>	15.1	8	28	8	7.9	MS 12/13	10	23.8	MS		
			4	1	8	7.7	8	15.7	8	28	8	7.9	MK 12/17					
Ref.Tox.-ammonia	40	mg/L	0	Stock	8	8.0	8 <sup>Ⓛ</sup>	14.9	8	28	8	7.8	MS 12/13	10	42.1	MS		
			4	1	8	7.7	8	15.6	8	28	8	7.9	MK 12/17					
Ref.Tox.-ammonia	80	mg/L	0	Stock	8	8.0	8 <sup>Ⓛ</sup>	14.6	8	28	8	7.8	MS 12/13	10	75.4	MS		
			4	1	8	7.8	8	15.5	8	28	8	7.9	MK 12/17					
Ref.Tox.-ammonia	160	mg/L	0	Stock	8	7.9	8 <sup>Ⓛ</sup>	14.6	8	29	8	7.6	MS 12/13	10	161	MS		
			4	1	8	7.9	8	15.6	8	29	8	7.9	MK 12/17					
Ref.Tox.-ammonia	320	mg/L	0	Stock	8	7.9	8 <sup>Ⓛ</sup>	14.9	8	29	8	7.5	MS 12/13	10	324	MS		
			4	1	8	7.9	8	15.6	8	29	8	7.8	MK 12/17					

Ⓛ used meter T16 to measure temp. -MS 12/13

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P 220819.14

CLIENT Pioneer		PROJECT Olympia Site	SPECIES Eohaustorius estuarius	PROJECT MANAGER M. Knowlton	LABORATORY Port Gamble	PROTOCOL PSEF
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**SURVIVAL & BEHAVIOR DATA**

OBSERVATION KEY N = Normal LOE = Loss of equilibrium Q = Quinscent DC = Discoloration NB = No body F = Floating on surface				DAY 1			DAY 2			DAY 3			DAY 4			
				DATE 12/14/22			DATE 12/15/22			DATE 12/16/22			DATE 12/17			
				TECHNICIAN LGA			TECHNICIAN MK			TECHNICIAN MK			TECHNICIAN MK			
SAMPLE ID	CONC.		REP	INITIAL NUMBER	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS
	value	units														
Ref.Tox.- Ammonia	0 mg/L	1	10	10	0	4F	10	0	3F	10	0	1F	10	0	2F	
		2	10	10	0	3F	10	0	N	10	0	1F	10	0	N	
		3	10	10	0	2F	10	0	2F	10	0	1F	10	0	N	
Ref.Tox.- Ammonia	20 mg/L	1	10	10	0	4F	10	0	2F	10	0	4F	9	1	6F	
		2	10	10	0	3F	10	0	2F	10	0	3F	10	0	3F	
		3	10	10	0	3F	10	0	3F	10	0	2F	10	0	2F	
Ref.Tox.- Ammonia	40 mg/L	1	10	10	0	2F	10	0	N	10	0	N	9	1	3F	
		2	10	10	0	6F	10	0	4F	10	0	2F	10	0	3F	
		3	10	10	0	5F	10	0	4F	10	0	1F	10	0	N	
Ref.Tox.- Ammonia	80 mg/L	1	10	10	0	8F	10	0	9F	9	1	6F	9	0	3F	
		2	10	10	0	3F	10	0	3F	9	1	1F	9	0	2F	
		3	10	10	0	5F	10	0	5F	10	0	3F	9	1	5F	
Ref.Tox.- Ammonia	160 mg/L	1	10	10	0	3F 1Q	10	0	3F	9	1	2F	8	1	3F	
		2	10	10	0	6F 1Q	10	0	6F	5	5	Q	2	3	Q	
		3	10	10	0	8F 1Q	9	1	9F	8	1	5F	7	1	2F	
Ref.Tox.- Ammonia	320 mg/L	1	10	8	2	5F 8Q	0	8	-	-	-	-	-	-	-	
		2	10	7	3	3F 6Q	5	2	Q	1	4	Q	0	1	-	
		3	10	8	2	3F 4Q	2	5	Q 1NB	0	2	-	-	-	-	

**Ammonia Reference Toxicant  
Spiking Worksheet**

Reference Toxicant ID: P220819.14  
 Date Prepared: 12/13/22  
 Technician Initials: MS

# Eoh NH<sub>3</sub> RT

Assumptions in Model  
 Stock ammonia concentration is 10,000 mg/L = 10 mg/mL

Date: 12/13/2022  
 Measurement: 9,057

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration	Desired Concentration	Volume		
mg/L	mg/L	mL	mL stock to increase	
				SALT WATER
23.8	20	750		2.484
42.1	40	750		4.969
75.4	80	750		9.937
161	160	750		19.875
324	320	750		39.750

**2. *Neanthes arenaceodentata* 20-Day Solid-Phase Test**

## 2.1 *Neanthes arenaceodentata* Test Data



**GENERAL**

<b>Client</b>	Pioneer
<b>Project</b>	Olympia Site
<b>Project Number</b>	PG1661
<b>Project Manager</b>	M. Knowlen
<b>Date Oldest Sample Collected</b>	11/18/2022
<b>Sample Holding Time</b>	26
<b>Test Start Date</b>	12/14/22
<b>Test Species</b>	<i>Neanthes arenaceodentata</i>
<b>Organism Supplier</b>	Aquatic Toxicology Support
<b>Organism Acquired</b>	12/14/2022
<b>Organism Acclimation</b>	0
<b>Organism Age</b>	Juvenile (2-3 weeks post emergence)
<b>Test Type/Duration</b>	20-Day Solid Phase
<b>Test Protocol</b>	PSEP 1995
<b>Regional Protocol</b>	SCUM 2021
<b>Laboratory Location</b>	Port Gamble
<b>Test Location</b>	Bath 1
<b>Sample Treatment</b>	Test samples sieved 4mm, CARR-REF-7 sieved 2mm
<b>Control Sediment Source</b>	Yaquina Bay, OR
<b>Water Batch</b>	FSW121222.01
<b>Test Lighting</b>	Continuous
<b>Test Chamber</b>	1 L glass jars
<b>Replicates Per Treatment</b>	5 replicates + 2 surrogates
<b>Organisms per Replicate</b>	5
<b>Exposure Volume</b>	2 cm sediment/ 775 mL water
<b>Feeding Information</b>	40 mg Tetramin/Replicate every other day
<b>Test Dissolved Oxygen</b>	> 4.6
<b>Test Temperature</b>	20 ± 1
<b>Test Salinity</b>	28 ± 2
<b>Test pH</b>	8 ± 1
<b>Water Renewal Info</b>	Renewed every third day

Note: input lowest and highest decimal for temp

Test Parameters		
	Min	Max
<b>DO:</b>	4.6	
<b>Temp:</b>	18.5	21.4
<b>Sal:</b>	26	30
<b>pH:</b>	7	9

<b>Temp Hobo ID</b>
NA

<b>TEST START TIME:</b>	1445
<b>TEST END TIME:</b>	1013

	CLIENT SAMPLE ID	LAB ID
1	Control	P221207.02
2	CARR-REF-1	P221119.02
3	CARR-REF-7	P221119.08
4	SD-70	P221201.03
5	SD-71	P221201.04
6	SD-72	P221201.05
7	SD-73	P221201.06
8	SD-74	P221201.07
9	SD-75	P221201.08
10	.	.
11	.	.
12	.	.
13	.	.
14	.	.
15	.	.
16	.	.
17	.	.
18	.	.
19	.	.
20	.	.

<b>Food Batch ID</b>
251523-454GR

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## 20 Day SP Test Pretest

CLIENT				PROJECT				PROJECT MANAGER				SPECIES			
Pioneer				Olympia Site				M. Knowlen				<i>Neanthes arenaceodentata</i>			
		Oven Event 1	Oven Event 2	Muffle Furnace	Calculated Dry Weights				Calculated Ash Free Dry Weights						
Oven ID:		Persephone	Beelzebub	Persephone											
Date/Time/Initials In Oven:		Pre-ashed boats	12/14/22 1555	12/19/22 0820 MK											
Oven Temp °C:		550	60	550											
Date/Time/Initials Out Oven into Dessicator:		Pre-ashed boats	12/15/22 0730 nl	12/19/22 1415 MK											
Date/Time/Initials Weighed:		12/14/22 1540 MK	12/19/22 0815 MK	12/19/22 1445 MK											
Balance ID:		3	3	3											
Rep/Boat #	Number Animals Weighed	Tare Wt. (mg)	Total Dry Wt. (mg)	Total Ashed Wt. (mg)	Dry Weight per Replicate (mg)	Dry Weight per Individual (mg)	Mean Individual Dry Weight (mg)	SD	Ash-Free Dry Weight per Replicate (mg)	AFDW per Individual (mg)	Mean Individual AFDW (mg)	SD			
35	5	430.05	437.31	433.92	7.26	1.452			3.39	0.678					
58	5	279.2	281.97	279.98	2.77	0.554			1.99	0.398					
x1	5	332.6	337.47	334.79	4.87	0.974	0.993	0.45	2.68	0.536	0.537	0.14			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
Control	0	Surr	14	NL	12/14/22	8	7.7	19.9	28	8.0			PM feeding inadvertently skipped
Control	1	Surr	14	MK	12/15/22	9	7.6	20.6	28	8.1			Fed in AM. MK 12/15
Control	2	Surr	14	MK	12/16/22	7	7.4	20.7	28	7.9		NL	
Control	3	Surr	14	MK	12/17/22	8	7.8	16.3	28	7.8	MK		Decreased water level in bath to raise temp. MK 12/17
Control	4	Surr	14	LG	12/18/22	8	7.4	20.4	29	8.0		LG	
Control	5	Surr	14	LG	12/19/22	8	7.4	20.2	28	7.9			
Control	6	Surr	14	MS	12/20/22	7	7.4	20.4	28	8.0	MS	MS	
Control	7	Surr	14	DM	12/21/22	8	7.5	20.2	28	7.9			
Control	8	Surr	14	SZ	12/22/22	7	7.6	20.0	28	7.9		SZ	
Control	9	Surr	14	MS	12/23/22	8	7.1	20.5	29	7.9	MS		
Control	10	Surr	14	NL	12/24/22	8	7.3	20.6	29	8.0		NL	
Control	11	Surr	14	LG	12/25/22	8	6.8	20.9	29	7.7			
Control	12	Surr	14	SR	12/26/22	8	7.1	20.5	29	7.9		MK	Water renewal inadvertently skipped. MK 12/26
Control	13	Surr	14	LG	12/27/22	8	6.7	20.9	29	7.8			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
Control	14	Surr	14	SR	12/28/22	9	7.1	20.5	29	7.9		MK	
Control	15	Surr	14	SZ	12/29/22	8	7.1	20.7	29	7.8	SZ		
Control	16	Surr	14	SZ	12/30/22	7	7.2	20.6	29	7.9		SZ	
Control	17	Surr	14	NL	12/31/22	9	6.9	20.7	29	7.8			
Control	18	Surr	14	NL	01/01/23	7	7.1	20.8	29	7.9	NL	NL	
Control	19	Surr	14	MS	01/02/23	9	6.9	20.6	30	7.7			
Control	20	Surr	14	DM	01/03/23	8	6.8	20.6	29	7.8			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
CARR-REF-1	0	Surr	16	NL	12/14/22	8	7.6	20.1	29	8.1			PM feeding inadvertently skipped
CARR-REF-1	1	Surr	16	MK	12/15/22	9	7.5	20.7	29	8.0			Fed in AM. MK 12/15
CARR-REF-1	2	Surr	16	MK	12/16/22	7	7.4	20.8	28	7.8		NL	
CARR-REF-1	3	Surr	16	MK	12/17/22	8	7.6	16.5	29	7.8	MK		Decreased water level in bath to raise temp. MK 12/17
CARR-REF-1	4	Surr	16	LG	12/18/22	8	7.4	20.4	29	8.0		LG	
CARR-REF-1	5	Surr	16	LG	12/19/22	8	7.4	20.3	28	8.0			
CARR-REF-1	6	Surr	16	MS	12/20/22	7	7.3	20.5	29	8.0	MS	MS	
CARR-REF-1	7	Surr	16	DM	12/21/22	8	7.4	20.2	29	7.9			
CARR-REF-1	8	Surr	16	SZ	12/22/22	7	7.6	20.2	29	8.0		SZ	
CARR-REF-1	9	Surr	16	MS	12/23/22	8	7.0	20.6	29	7.9	MS		
CARR-REF-1	10	Surr	16	NL	12/24/22	8	7.2	20.7	29	8.1		NL	
CARR-REF-1	11	Surr	16	LG	12/25/22	8	6.9	21.0	29	8.0			
CARR-REF-1	12	Surr	16	SR	12/26/22	8	7.2	20.7	29	8.1		MK	Water renewal inadvertently skipped. MK 12/26
CARR-REF-1	13	Surr	16	LG	12/27/22	8	6.9	20.9	29	8.0			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
CARR-REF-1	14	Surr	16	SR	12/28/22	9	7.3	20.5	29	8.1		MK	
CARR-REF-1	15	Surr	16	SZ	12/29/22	8	7.1	20.8	29	8.0	SZ		
CARR-REF-1	16	Surr	16	SZ	12/30/22	7	7.2	20.7	29	8.1		SZ	
CARR-REF-1	17	Surr	16	NL	12/31/22	9	7.1	20.7	29	8.0			
CARR-REF-1	18	Surr	16	NL	01/01/23	7	7.3	20.9	30	8.1	NL	NL	
CARR-REF-1	19	Surr	16	MS	01/02/23	9	7.1	20.6	30	8.0			
CARR-REF-1	20	Surr	16	DM	01/03/23	8	7.2	20.7	30	8.1			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
CARR-REF-7	0	Surr	17	NL	12/14/22	8	7.7	20.0	29	8.0			PM feeding inadvertently skipped
CARR-REF-7	1	Surr	17	MK	12/15/22	9	7.6	20.6	29	8.0			Fed in AM. MK 12/15
CARR-REF-7	2	Surr	17	MK	12/16/22	7	7.4	20.7	28	7.9		NL	
CARR-REF-7	3	Surr	17	MK	12/17/22	8	7.6	16.7	29	7.8	MK		Decreased water level in bath to raise temp. MK 12/17
CARR-REF-7	4	Surr	17	LG	12/18/22	8	7.4	20.3	29	8.0		LG	
CARR-REF-7	5	Surr	17	LG	12/19/22	8	7.1	20.1	28	7.9			
CARR-REF-7	6	Surr	17	MS	12/20/22	7	7.3	20.3	28	8.0	MS	MS	
CARR-REF-7	7	Surr	17	DM	12/21/22	8	7.0	20.3	28	7.9			
CARR-REF-7	8	Surr	17	SZ	12/22/22	7	7.5	20.0	28	7.9		SZ	
CARR-REF-7	9	Surr	17	MS	12/23/22	8	6.9	20.5	29	7.9	MS		
CARR-REF-7	10	Surr	17	NL	12/24/22	8	7.0	20.6	29	8.0		NL	
CARR-REF-7	11	Surr	17	LG	12/25/22	8	7.0	20.9	29	7.9			
CARR-REF-7	12	Surr	17	SR	12/26/22	8	7.1	20.5	29	8.0		MK	Water renewal inadvertently skipped. MK 12/26
CARR-REF-7	13	Surr	17	LG	12/27/22	8	7.0	20.9	29	8.5			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
CARR-REF-7	14	Surr	17	SR	12/28/22	9	7.0	20.5	29	7.9		MK	
CARR-REF-7	15	Surr	17	SZ	12/29/22	8	7.1	20.7	29	7.9	SZ		
CARR-REF-7	16	Surr	17	SZ	12/30/22	7	7.2	20.6	29	7.9		SZ	
CARR-REF-7	17	Surr	17	NL	12/31/22	9	6.9	20.7	29	7.9			
CARR-REF-7	18	Surr	17	NL	01/01/23	7	7.2	20.8	29	7.9	NL	NL	
CARR-REF-7	19	Surr	17	MS	01/02/23	9	6.9	20.5	30	7.8			
CARR-REF-7	20	Surr	17	DM	01/03/23	8	7.1	20.6	29	7.8			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
SD-70	0	Surr	30	NL	12/14/22	8	7.4	20.2	28	7.9			PM feeding inadvertently skipped
SD-70	1	Surr	30	MK	12/15/22	9	7.4	20.6	28	7.9			Fed in AM. MK 12/15
SD-70	2	Surr	30	MK	12/16/22	7	7.3	21.0	28	7.9		NL	
SD-70	3	Surr	30	MK	12/17/22	8	7.5	16.8	28	7.9	MK		Decreased water level in bath to raise temp. MK 12/17
SD-70	4	Surr	30	LG	12/18/22	8	7.1	20.5	29	8.1		LG	
SD-70	5	Surr	30	LG	12/19/22	8	6.8	20.4	28	8.1			
SD-70	6	Surr	30	MS	12/20/22	7	7.0	20.5	28	8.3	MS	MS	
SD-70	7	Surr	30	DM	12/21/22	8	7.1	20.5	28	8.3			
SD-70	8	Surr	30	SZ	12/22/22	7	7.0	20.3	28	8.4		SZ	
SD-70	9	Surr	30	MS	12/23/22	8	6.5	20.6	28	8.3	MS		
SD-70	10	Surr	30	NL	12/24/22	8	7.2	20.6	29	8.5		NL	
SD-70	11	Surr	30	LG	12/25/22	8	7.3	20.9	29	8.5			
SD-70	12	Surr	30	SR	12/26/22	8	7.3	20.6	29	8.6		MK	Water renewal inadvertently skipped. MK 12/26
SD-70	13	Surr	30	LG	12/27/22	8	7.0	20.9	29	8.5			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
SD-70	14	Surr	30	SR	12/28/22	9	7.3	20.5	29	8.5		MK	
SD-70	15	Surr	30	SZ	12/29/22	8	7.3	20.8	29	8.5	SZ		
SD-70	16	Surr	30	SZ	12/30/22	7	7.3	20.7	29	8.5		SZ	
SD-70	17	Surr	30	NL	12/31/22	9	7.1	20.7	29	8.3			
SD-70	18	Surr	30	NL	01/01/23	7	7.4	20.8	30	8.4	NL	NL	
SD-70	19	Surr	30	MS	01/02/23	9	7.2	20.5	30	8.3			
SD-70	20	Surr	30	DM	01/03/23	8	7.3	20.6	30	8.3			



## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
SD-71	0	Surr	12	NL	12/14/22	8	7.6	20.0	28	8.0			PM feeding inadvertently skipped
SD-71	1	Surr	12	MK	12/15/22	9	7.6	20.6	29	8.1			Fed in AM. MK 12/15
SD-71	2	Surr	12	MK	12/16/22	7	7.5	20.8	28	8.0		NL	
SD-71	3	Surr	12	MK	12/17/22	8	7.8	16.7	29	8.0	MK		Decreased water level in bath to raise temp. MK 12/17
SD-71	4	Surr	12	LG	12/18/22	8	7.3	20.4	29	8.2		LG	
SD-71	5	Surr	12	LG	12/19/22	8	7.1	20.2	28	8.1			
SD-71	6	Surr	12	MS	12/20/22	7	7.2	20.4	28	8.4	MS	MS	
SD-71	7	Surr	12	DM	12/21/22	8	7.2	20.3	29	8.4			
SD-71	8	Surr	12	SZ	12/22/22	7	7.4	20.2	28	8.4		SZ	
SD-71	9	Surr	12	MS	12/23/22	8	7.2	20.5	29	8.4	MS		
SD-71	10	Surr	12	NL	12/24/22	8	7.2	20.7	29	8.4		NL	
SD-71	11	Surr	12	LG	12/25/22	8	7.2	20.9	29	8.4			
SD-71	12	Surr	12	SR	12/26/22	8	7.2	20.6	29	8.5		MK	Water renewal inadvertently skipped. MK 12/26
SD-71	13	Surr	12	LG	12/27/22	8	7.0	20.9	29	8.5			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
SD-71	14	Surr	12	SR	12/28/22	9	7.3	20.5	29	8.5		MK	
SD-71	15	Surr	12	SZ	12/29/22	8	7.2	20.7	29	8.5	SZ		
SD-71	16	Surr	12	SZ	12/30/22	7	7.3	20.6	29	8.5		SZ	
SD-71	17	Surr	12	NL	12/31/22	9	7.2	20.7	29	8.4			
SD-71	18	Surr	12	NL	01/01/23	7	7.4	20.8	30	8.4	NL	NL	
SD-71	19	Surr	12	MS	01/02/23	9	7.4	20.6	30	8.3			
SD-71	20	Surr	12	DM	01/03/23	8	7.3	20.7	30	8.4			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
SD-72	0	Surr	3	NL	12/14/22	8	7.5	20.6	28	8.0			PM feeding inadvertently skipped
SD-72	1	Surr	3	MK	12/15/22	9	7.4	21.1	29	8.0			Fed in AM. MK 12/15
SD-72	2	Surr	3	MK	12/16/22	7	7.3	21.3	28	7.8		NL	
SD-72	3	Surr	3	MK	12/17/22	8	7.6	17.4	29	7.7	MK		Decreased water level in bath to raise temp. MK 12/17
SD-72	4	Surr	3	LG	12/18/22	8	7.2	20.5	29	7.9		LG	
SD-72	5	Surr	3	LG	12/19/22	8	6.4	20.2	28	7.8			
SD-72	6	Surr	3	MS	12/20/22	7	6.8	20.4	28	8.1	MS	MS	
SD-72	7	Surr	3	DM	12/21/22	8	6.4	20.5	28	8.0			
SD-72	8	Surr	3	SZ	12/22/22	7	7.5	20.4	29	8.2		SZ	
SD-72	9	Surr	3	MS	12/23/22	8	6.9	21.4	28	8.2	MS		
SD-72	10	Surr	3	NL	12/24/22	8	7.1	20.6	29	8.3		NL	
SD-72	11	Surr	3	LG	12/25/22	8	6.9	21.0	29	8.1			
SD-72	12	Surr	3	SR	12/26/22	8	6.9	20.9	29	8.3		MK	Water renewal inadvertently skipped. MK 12/26
SD-72	13	Surr	3	LG	12/27/22	8	6.5	21.4	29	8.3			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
SD-72	14	Surr	3	SR	12/28/22	9	6.9	20.5	29	8.3		MK	
SD-72	15	Surr	3	SZ	12/29/22	8	7.0	20.9	29	8.3	SZ		
SD-72	16	Surr	3	SZ	12/30/22	7	7.1	20.7	29	8.3		SZ	
SD-72	17	Surr	3	NL	12/31/22	9	6.9	21.0	29	8.3			
SD-72	18	Surr	3	NL	01/01/23	7	7.2	21.4	29	8.3	NL	NL	
SD-72	19	Surr	3	MS	01/02/23	9	6.9	21.1	30	8.2			
SD-72	20	Surr	3	DM	01/03/23	8	7.1	21.3	30	8.3			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
SD-73	0	Surr	4	NL	12/14/22	8	7.5	20.7	29	8.0			PM feeding inadvertently skipped
SD-73	1	Surr	4	MK	12/15/22	9	7.7	21.1	29	8.0			Fed in AM. MK 12/15
SD-73	2	Surr	4	MK	12/16/22	7	7.4	21.2	29	7.9		NL	
SD-73	3	Surr	4	MK	12/17/22	8	7.7	17.1	29	7.8	MK		Decreased water level in bath to raise temp. MK 12/17
SD-73	4	Surr	4	LG	12/18/22	8	7.3	20.7	29	8.0		LG	
SD-73	5	Surr	4	LG	12/19/22	8	7.2	20.4	28	7.9			
SD-73	6	Surr	4	MS	12/20/22	7	7.2	20.7	28	8.0	MS	MS	
SD-73	7	Surr	4	DM	12/21/22	8	7.2	20.7	28	8.0			
SD-73	8	Surr	4	SZ	12/22/22	7	7.5	20.6	28	8.1		SZ	
SD-73	9	Surr	4	MS	12/23/22	8	7.0	21.2	29	8.1	MS		
SD-73	10	Surr	4	NL	12/24/22	8	7.1	20.8	29	8.1		NL	
SD-73	11	Surr	4	LG	12/25/22	8	7.0	21.1	29	8.0			
SD-73	12	Surr	4	SR	12/26/22	8	7.1	20.9	29	8.2		MK	Water renewal inadvertently skipped. MK 12/26
SD-73	13	Surr	4	LG	12/27/22	8	6.6	21.3	29	8.1			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
SD-73	14	Surr	4	SR	12/28/22	9	7.1	20.7	29	8.1		MK	
SD-73	15	Surr	4	SZ	12/29/22	8	7.0	21.0	29	8.1	SZ		
SD-73	16	Surr	4	SZ	12/30/22	7	7.1	20.8	29	8.1		SZ	
SD-73	17	Surr	4	NL	12/31/22	9	6.9	21.1	29	8.1			
SD-73	18	Surr	4	NL	01/01/23	7	7.2	21.2	29	8.1	NL	NL	
SD-73	19	Surr	4	MS	01/02/23	9	7.0	21.0	30	8.0			
SD-73	20	Surr	4	DM	01/03/23	8	7.1	21.3	29	8.1			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
SD-74	0	Surr	32	NL	12/14/22	8	7.4	20.0	28	8.0			PM feeding inadvertently skipped
SD-74	1	Surr	32	MK	12/15/22	9	7.5	20.6	28	7.7			Fed in AM. MK 12/15
SD-74	2	Surr	32	MK	12/16/22	7	7.3	20.9	28	7.9		NL	
SD-74	3	Surr	32	MK	12/17/22	8	7.5	17.2	27	7.7	MK		Decreased water level in bath to raise temp. MK 12/17
SD-74	4	Surr	32	LG	12/18/22	8	7.3	20.4	29	8.1		LG	
SD-74	5	Surr	32	LG	12/19/22	8	7.2	20.4	28	8.1			
SD-74	6	Surr	32	MS	12/20/22	7	7.2	20.4	28	8.3	MS	MS	
SD-74	7	Surr	32	DM	12/21/22	8	7.2	20.3	28	8.2			
SD-74	8	Surr	32	SZ	12/22/22	7	7.4	20.2	28	8.3		SZ	
SD-74	9	Surr	32	MS	12/23/22	8	6.9	20.6	29	8.2	MS		
SD-74	10	Surr	32	NL	12/24/22	8	7.2	20.6	29	8.3		NL	
SD-74	11	Surr	32	LG	12/25/22	8	6.9	20.9	29	8.1			
SD-74	12	Surr	32	SR	12/26/22	8	6.9	20.6	29	8.2		MK	Water renewal inadvertently skipped. MK 12/26
SD-74	13	Surr	32	LG	12/27/22	8	6.5	20.9	29	8.0			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
SD-74	14	Surr	32	SR	12/28/22	9	7.0	20.5	29	8.1		MK	
SD-74	15	Surr	32	SZ	12/29/22	8	6.8	20.8	29	8.1	SZ		
SD-74	16	Surr	32	SZ	12/30/22	7	7.1	20.7	29	8.2		SZ	
SD-74	17	Surr	32	NL	12/31/22	9	6.7	20.7	29	8.1			
SD-74	18	Surr	32	NL	01/01/23	7	7.2	20.9	29	8.2	NL	NL	
SD-74	19	Surr	32	MS	01/02/23	9	7.0	20.6	30	8.1			
SD-74	20	Surr	32	DM	01/03/23	8	7.4	20.5	30	8.2			

## 20 Day SP Test WQ Data Sheet

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	<b>LOCATION</b> Port Gamble / Bath 1	<b>PROTOCOL</b> PSEP 1995 , SCUM 2021
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE/DURATION</b> 20-Day Solid Phase	<b>PROJECT NUMBER</b> PG1661	<b>TEST START DATE</b> December 14, 2022	<b>TEST END DATE</b> January 3, 2023

### WATER QUALITY DATA

SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Water Renewal	Feed 40 mg Tetramin/Rep	Notes
							> 4.6	19 - 21	26 - 30	7 - 9			
SD-75	0	Surr	8	NL	12/14/22	8	7.6	20.2	28	8.0			PM feeding inadvertently skipped
SD-75	1	Surr	8	MK	12/15/22	9	7.5	20.8	28	8.0			Fed in AM. MK 12/15
SD-75	2	Surr	8	MK	12/16/22	7	7.5	20.8	28	7.9		NL	
SD-75	3	Surr	8	MK	12/17/22	8	7.7	16.7	28	7.8	MK		Decreased water level in bath to raise temp. MK 12/17
SD-75	4	Surr	8	LG	12/18/22	8	7.4	20.4	29	8.0		LG	
SD-75	5	Surr	8	LG	12/19/22	8	7.3	20.2	28	7.9			
SD-75	6	Surr	8	MS	12/20/22	7	7.2	20.4	28	8.1	MS	MS	
SD-75	7	Surr	8	DM	12/21/22	8	7.3	20.3	28	8.1			
SD-75	8	Surr	8	SZ	12/22/22	7	7.4	20.2	28	8.1		SZ	
SD-75	9	Surr	8	MS	12/23/22	8	7.0	20.7	28	8.1	MS		
SD-75	10	Surr	8	NL	12/24/22	8	6.8	20.6	29	8.1		NL	
SD-75	11	Surr	8	LG	12/25/22	8	7.0	21.0	29	7.9			
SD-75	12	Surr	8	SR	12/26/22	8	6.8	20.6	29	8.1		MK	Water renewal inadvertently skipped. MK 12/26
SD-75	13	Surr	8	LG	12/27/22	8	6.5	21.0	29	8.0			Test renewed due to inadvertently missing renewal day prior. MS/LG 12/27
SD-75	14	Surr	8	SR	12/28/22	9	6.9	20.5	29	8.0		MK	
SD-75	15	Surr	8	SZ	12/29/22	8	6.8	20.7	29	8.0	SZ		
SD-75	16	Surr	8	SZ	12/30/22	7	7.1	20.6	29	8.1		SZ	
SD-75	17	Surr	8	NL	12/31/22	9	6.8	20.7	29	8.0			
SD-75	18	Surr	8	NL	01/01/23	7	7.2	20.9	29	8.2	NL	NL	
SD-75	19	Surr	8	MS	01/02/23	9	6.8	20.7	30	7.9			
SD-75	20	Surr	8	DM	01/03/23	8	7.1	20.9	29	8.0			

20 Day SP Test Obs Sheet

CLIENT		PROJECT			PROJECT NO.	PROJECT MANAGER				LOCATION			PROTOCOL				SPECIES								
Pioneer		Olympia Site			PG1661	M. Knowlen				Port Gamble / Bath 1			PSEP 1995, SCUM 2021				<i>Neanthes arenaceodentata</i>								
<b>Observation Key</b> #FOS = Num Floating on Water Surface #E = Num Emerged from Sediment #M = Number of Mortalities L = Anoxic Surface G = Growth D = No Air Flow (Measure DO) N = Normal TC = Too Cloudy to Observe U = Excess Food					ENDPOINT DATA & OBSERVATIONS																				
					Technician	MK	MK	MK	LG	LG	M5	DM	SZ	M5	NL	LG	MK	LG	SR	SZ	SZ	NL	NL	M5	DM
CLIENT ID	REP	Jar #	Initial #	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Comments
Control	1	11	5	12/15/22	N	N	U	N	U	U	U	N	N	N	N	N	U	N	U	N	N	N	N	U	
Control	2	2	5	12/16/22	N	N	U	N	U	N	U	U,1E	N	N	N	U	2E	1E	U	U	2E	N	3E	U,1E	
Control	3	22	5	12/17/22	N	N	U	N	U	U	U	N	U	U	N	N	U	N	U	U	N	N	N	U	
Control	4	28	5	12/18/22	N	N	U	N	U	U	U	N	U	U	N	N	U	N	U	N	N	N	N	U,G,1E	
Control	5	25	5	12/19/22	N	N	U	N	U	U	U	N	U,L	U,L	L	N	U,G,L	N	U,L	N	N	N	N	U,G,1E	
CARR-REF-1	1	47	5	12/20/22	N	N	U	N	U	U	U	N	N	U	N	N	G	N	U	N	N	N	N	U	
CARR-REF-1	2	13	5	12/21/22	N	N	U	N	U	U,G,L	U	N	U,L	U,L	1E,G,L	N	U,G,L	G,L	G,L	1E,L	L	L	G,L	U,G,L	
CARR-REF-1	3	41	5	12/22/22	N	N	U	N	U	U	N	N	U	N	N	N	N	N	N	N	1E	N	1E	U,G,1E	
CARR-REF-1	4	39	5	12/23/22	N	N	U	N	U	U	U	N	U	U	N	N	G	G	U	N	N	1E	G	U,G	
CARR-REF-1	5	15	5	12/24/22	N	N	U	N	U	U	U,G	U	U,L	U,L	G	N	G	G	G	G	G	G	G,L	U,G,L	
CARR-REF-7	1	34	5	12/25/22	N	N	U	N	U	U	U	N	U,G	U,G	G	G	N	G	U	N	N	1E	N	U	
CARR-REF-7	2	45	5	12/26/22	N	N	U	N	U	U	U	N	G	U,G	G	G	G	G	U	N	N	N	G	U,G	
CARR-REF-7	3	44	5	12/27/22	N	N	U	N	U	U	N	U,G	U,G	G	G	G	G	G	N	N	N	N	N	U,1E	
CARR-REF-7	4	19	5	12/28/22	N	N	U	N	U	U	U	N	U,G	U,G	N	G	U	G	U	N	N	1E	L	U,G,L	
CARR-REF-7	5	21	5	12/29/22	N	N	U	N	U	U	U	N	U,G	U,G	1E,G	G	U	G	U	1E	N	N	N	U	
SD-70	1	46	5	12/30/22	N	N	U	N	U,G	U,L	U,G,L	N	U,L	U,L	G,L	G	G,L	G,L	U,G,L	G	1E,G	G	G	U,G	
SD-70	2	24	5	12/31/22	N	N	U	N	U,G	U,G,L	U,G,L	G,L	U,G	U,G	G,L	G	G,L	G,L	U,G,L	G	G	1E,G	G	U,G	
SD-70	3	51	5	01/01/23	N	N	U	N	U	U	U	N	U	U	G	G	G	G	2E,U,G	G	G	G	G	U,G	
SD-70	4	27	5	01/02/23	N	N	U	N	U	U	U	N	U,G,L	U,G,L	G,L	G	G,L	G,L	U,G	G	G,L	G,L	G,L	U,G,L	
SD-70	5	54	5	01/03/23	N	N	U	N	U	U	U	G	U,G,L	U,G,L	G	G	G	G	U,G	G	G	G	G	U,G	
SD-71	1	48	5	01/04/23	N	N	U	N	U	U	U,G,L	N	U,L	U,L	G,L	G	G	G,L	U,G	G	G	G	G	U,G	
SD-71	2	23	5	01/05/23	N	N	U	N	U,G	U,G,L	U,G,L	N	U,G,L	U,G,L	G,L	G	G,L	G,L	1E,G,U	G	G	G	G	U,G,1E	
SD-71	3	36	5	01/06/23	N	N	U	N	U,G	U,L	U,G,L	G,L	U,G,L	U,G,L	G,L	G	U,G,L	G,L	U,G	LG	1E,G,L	G,L	G	U,G	
SD-71	4	52	5	01/07/23	N	N	U	N	U	U,L	U,G,L	N	U,G,L	U,G,L	G	G	G	G	1E,U,G	G	G	G	G	U,G	
SD-71	5	38	5	01/08/23	N	N	U	N	U	U	U	N	U,G,L	U,G,L	G,L	G	G,L	1E	1E,U,G	1E,G	G	G	G	U,G,1E	

CLIENT				PROJECT		PROJECT NO.	PROJECT MANAGER			LOCATION		PROTOCOL				SPECIES									
Pioneer				Olympia Site		PG1661	M. Knowlen			Port Gamble / Bath 1		PSEP 1995, SCUM 2021				<i>Neanthes arenaceodentata</i>									
<b>Observation Key</b> #FOS = Num Floating on Water Surface #E = Num Emerged from Sediment #M = Number of Mortalities L = Anoxic Surface G = Growth D = No Air Flow (Measure DO) N = Normal TC = Too Cloudy to Observe U = Excess Food					ENDPOINT DATA & OBSERVATIONS																				
					Technician	MK	MK	MK	LG	LG	M5	DM	SZ	M5	NL	LG	MK	LG	SR	SZ	SZ	NL	NL	M5	DM
CLIENT ID	REP	Jar #	Initial #	Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Comments
SD-72	1	1	5	12/15/22	N	N	U	N	U	N	U,G,L	G	U,L	U,L	L	G	L	N	1E, L,G	1E, G	G,L	G,L	G,L	U,G,L,1E	
SD-72	2	50	5	12/16/22	N	N	U	N	U	U	U	N	U	U	G	1E	G	G	N	1E	G	G	1E	U,G	
SD-72	3	7	5	12/17/22	N	N	U	N	U	U,L	U,G,L	U,G,L	U,L	U,L	G L	G	G L	G, L	U,L,G	G,L	G,L	G,L	G,L	U,G,L	
SD-72	4	20	5	12/18/22	N	N	U	N	U	U	U	U	U	U	N	G	U	G	N	G	N	N	N	U	
SD-72	5	9	5	12/19/22	N	N	U	N	U	U,L	U,G,L	U,G,L	U,L	U,L	G L	1E	G L	G, L	U,L,G	G,L	G,L	G,L	G,L	U,G,L	
SD-73	1	49	5	12/20/22	N	N	U	N	U G	U,L	U,G,L	N	U,L	U,L	N	G	U G	G	U	N	G	G	G	U,G	
SD-73	2	43	5	12/21/22	N	N	U	N	U G 1E	U,L	U,G,L	L	U	U,L	G	G	G	G	N	N	N	N	N	U	
SD-73	3	5	5	12/22/22	N	N	U	N	U	U	U	U	U	N	N	G	N	N	U	N	N	N	N	N	
SD-73	4	29	5	12/23/22	N	N	U	N	U	U	U	N	U	U	N	G	U	G	U,G	G	G	G	G	U,G	
SD-73	5	18	5	12/24/22	N	N	U	N	U	U	U,G,L	U	U,G,L	U,G,L	G	G	1E G	G	U,G	N	U	N	N	U	
SD-74	1	31	5	12/25/22	N	N	U	N	U	U	U	N	U	U	N	G	N	G	G	G	G	G	G	U	
SD-74	2	42	5	12/26/22	N	N	U	N	U	U,L	U,G,L	U	U,G	U,G	G L	G	G L	G	U	G	G	G	G	U,G	
SD-74	3	35	5	12/27/22	N	N	U	N	U	U	U	G	U	U,G,L	N	G	N	G	U	N	N	N	N	U	
SD-74	4	10	5	12/28/22	N	N	U	N	U	U	U	U	U,G,L	U,G,L	G L	G	GL	G	G	1E,G	G	G	G,L	U,G	
SD-74	5	53	5	12/29/22	N	N	U	N	U	U	U	G	U,G	U,G	G	G	U G	G	U,G	G	G	G	G	U,G	
SD-75	1	33	5	12/30/22	N	N	U	N	U	U	U	N	U	U	N	G	G	G	U,G	G	G	G	G,L	U,G,L	
SD-75	2	6	5	01/01/23	N	N	U	N	U	U,L	U,G,L	U,G,L	U	G,L	G L	G	L	G	1E,L,G	G,L	G,L	G,L	G,L	U,G,L	
SD-75	3	26	5	01/02/23	N	N	U	N	U	U	U	N	U,L	U,L	G L	G	G L	G	G	G	U,G	G	G	U,G	
SD-75	4	40	5	01/03/23	N	N	U	N	U	L	U,G,L,1E	L	U,L	U,L	L	G	L	G, L	1E, U,G,L	G,L	G,L	G,L	G,L	U,G,L	
SD-75	5	37	5	01/03/23	N	N	U	N	U G	U,L	U,G,L	G,L	U,G,L	U,G,L	G L	1E	G L	G	U,G	G	1E,G,L	G,L	G	U,G	



## 20 Day SP Test Survival Summary

CLIENT			PROJECT			PROJECT NUMBER	
Pioneer			Olympia Site			PG1661	
PROJECT MANAGER			SPECIES				
M. Knowlen			<i>Neanthes arenaceodentata</i>				
Sample ID	Rep	Jar #	Boat #	Date Recovered/ Initials: 1/3/23 DM/MS			Comments
				# Initiated	# Alive	# Dead	
Control	1	11	1	5	5	0	1 small worm, 1/2 size of others
Control	2	2	2	5	5	0	
Control	3	22	3	5	5	0	
Control	4	28	4	5	5	0	
Control	5	25	5	5	5	0	
CARR-REF-1	1	47	6	5	5	0	
CARR-REF-1	2	13	7	5	5	0	
CARR-REF-1	3	41	8	5	5	0	
CARR-REF-1	4	39	9	5	5	0	
CARR-REF-1	5	15	10	5	5	0	
CARR-REF-7	1	34	11	5	5	0	Native worms found.
CARR-REF-7	2	45	12	5	5	0	Native worms found.
CARR-REF-7	3	44	13	5	5	0	Native worms found.
CARR-REF-7	4	19	14	5	5	0	Native worms found.
CARR-REF-7	5	21	15	5	4	0	Native worms found.
SD-70	1	46	16	5	5	0	
SD-70	2	24	17	5	5	0	
SD-70	3	51	18	5	5	0	
SD-70	4	27	19	5	5	0	
SD-70	5	54	20	5	5	0	
SD-71	1	48	21	5	5	0	
SD-71	2	23	22	5	5	0	
SD-71	3	36	23	5	5	0	
SD-71	4	52	24	5	5	0	
SD-71	5	38	25	5	5	0	

**20 Day SP Test Survival Summary**

CLIENT				PROJECT			PROJECT NUMBER
Pioneer				Olympia Site			PG1661
PROJECT MANAGER				SPECIES			
M. Knowlen				<i>Neanthes arenaceodentata</i>			
Sample ID	Rep	Jar #	Boat #	Date Recovered/ Initials: 1/3/23 DM/MS			Comments
				# Initiated	# Alive	# Dead	
SD-72	1	1	26	5	5	0	
SD-72	2	50	27	5	5	0	
SD-72	3	7	28	5	5	0	
SD-72	4	20	29	5	5	0	
SD-72	5	9	30	5	5	0	
SD-73	1	49	31	5	5	0	
SD-73	2	43	32	5	5	0	
SD-73	3	5	33	5	5	0	
SD-73	4	29	34	5	5	0	
SD-73	5	18	35	5	5	0	
SD-74	1	31	36	5	5	0	
SD-74	2	42	37	5	5	0	
SD-74	3	35	38	5	5	0	
SD-74	4	10	39	5	5	0	
SD-74	5	53	40	5	5	0	
SD-75	1	33	41	5	5	0	
SD-75	2	6	42	5	5	0	1 small worm, 1/3 size of others
SD-75	3	26	43	5	5	0	
SD-75	4	40	44	5	5	0	
SD-75	5	37	45	5	5	0	

## 20 Day SP Test Weights Summary

CLIENT Pioneer			PROJECT Olympia Site			
PROJECT NUMBER PG1661		PROJECT MANAGER M. Knowlen			SPECIES <i>Neanthes arenaceodentata</i>	
			Oven Event 1	Oven Event 2	Muffle Furnace	
	Oven ID:		PERESPHONE	Beelzebub	Persephone	
	Date/Time/Initials In Oven:		12/30/22 0928 DM	1/3/23 1323 MS	1/6/23 0830 DM	
	Oven Temp °C:		550	60	550	
	Date/Time/Initials Out Oven into Dessicator:		12/30/22 1427 ms	1/4/23 1600 SZ	1/6/23 1427 SZ	
	Date/Time/Initials Weighed:		1/1/23 1230 SR	1/5/23 1435 SZ	1/9/23 1315 MK	
Balance ID:		#3	#3	#3		
Sample ID	Rep	Boat #	Tare Wt. (mg)	Total Dry Wt. (mg)	Total Ashed Wt. (mg)	Comments
Control	1	1	331.56	512.10	383.87	
Control	2	2	352.77	556.17	389.9	
Control	3	3	345.13	515.81	381.99	
Control	4	4	364.69	537.41	407.41	
Control	5	5	359.43	563.96	400.64	
CARR-REF-1	1	6	361.95	582.41	396.79	
CARR-REF-1	2	7	376.41	552.67	403.21	
CARR-REF-1	3	8	342.79	527.20	375.62	
CARR-REF-1	4	9	343.43	533.79	375.74	
CARR-REF-1	5	10	347.33	543.88	382.25	
CARR-REF-7	1	11	354.19	515.80	393.39	
CARR-REF-7	2	12	356.5	511.10	389.23	
CARR-REF-7	3	13	343.19	496.19	390.27	
CARR-REF-7	4	14	340.45	465.07	368.51	
CARR-REF-7	5	15	328.13	517.15	357.18	
SD-70	1	16	340.22	548.63	375.76	
SD-70	2	17	347.91	532.24	371.09	
SD-70	3	18	341.17	498.24	371.03	
SD-70	4	19	317.36	500.94	344.58	
SD-70	5	20	336.36	467.07	354.92	
SD-71	1	21	330.13	499.09	349.99	
SD-71	2	22	357.04	531.06	382.09	
SD-71	3	23	331.99	552.03	355.46	
SD-71	4	24	316.05	488.62	342.53	
SD-71	5	25	325.15	521.88	344.5	
SD-72	1	26	319.65	451.93	334.56	
SD-72	2	27	327.70	455.16	347.03	
SD-72	3	28	331.35	475.63	352.71	
SD-72	4	29	340.85	479.09	362.00	
SD-72	5	30	343.59	557.71	360.14	

## 20 Day SP Test Weights Summary

<b>CLIENT</b> Pioneer			<b>PROJECT</b> Olympia Site			
<b>PROJECT NUMBER</b> PG1661		<b>PROJECT MANAGER</b> M. Knowlen			<b>SPECIES</b> <i>Neanthes arenaceodentata</i>	
		<b>Oven Event 1</b>	<b>Oven Event 2</b>	<b>Muffle Furnace</b>		
		<b>Oven ID:</b>	PERESPHONE	Beelzebub	Persephone	
		<b>Date/Time/Initials In Oven:</b>	12/30/22 0928 DM	1/3/23 1323 MS	1/6/23 0830 DM	
		<b>Oven Temp °C:</b>	550	60	550	
		<b>Date/Time/Initials Out Oven into Dessicator:</b>	12/30/22 1427 ms	1/4/23 1600 SZ	1/6/23 1427 SZ	
		<b>Date/Time/Initials Weighed:</b>	1/1/23 1230 SR	1/5/23 1435 SZ	1/9/23 1315 MK	
		<b>Balance ID:</b>	#3	#3	#3	
<b>Sample ID</b>	<b>Rep</b>	<b>Boat #</b>	<b>Tare Wt. (mg)</b>	<b>Total Dry Wt. (mg)</b>	<b>Total Ashed Wt. (mg)</b>	<b>Comments</b>
SD-73	1	31	316.61	437.15	338.98	
SD-73	2	32	351.71	494.52	375.09	
SD-73	3	33	334.47	527.70	354.61	
SD-73	4	34	315.49	387.99	331.60	
SD-73	5	35	331.17	535.6	350.34	
SD-74	1	36	326.53	458.11	344.15	
SD-74	2	37	367.12	483.66	386.95	
SD-74	3	38	320.28	396.26	335.92	
SD-74	4	39	356.40	633.17	378.76	
SD-74	5	40	369.72	463.58	384.68	
SD-75	1	41	360.77	504.73	374.60	
SD-75	2	42	356.33	502.61	375.42	
SD-75	3	43	353.70	508.68	370.64	
SD-75	4	44	327.90	514.44	347.24	
SD-75	5	45	352.01	523.13	371.54	

### 20 Day SP Test Survival Summary

CLIENT			PROJECT		PROJECT NUMBER	PROJECT MANAGER		SPECIES													
Pioneer			Olympia Site		PG1661	M. Knowlen		<i>Neanthes arenaceodentata</i>													
Sample ID	Rep	# Initiated	Survival Statistics				Mortality Statistics			Calculated Dry Weights					Calculated Ash Free Dry Weights						
			# Alive	% Survival	Mean Survival (%)	SD	% Mortality	Mean Mortality (%)	SD	Dry Weight per Replicate - Biomass (mg)	Dry Weight per Individual Growth (mg)	Individual Growth Rate (mg/ind/d)	Mean Individual Growth Rate (mg/ind/d)	SD	AFDW per Replicate - Biomass (mg)	AFDW per Individual - Growth (mg)	Individual Growth Rate (mg/ind/d)	Mean Individual Growth Rate (mg/ind/d)	SD		
Control	1	5	5	100			0				180.54	36.108	1.756				128.23	25.646	1.255		
Control	2	5	5	100			0				203.4	40.680	1.984				166.27	33.254	1.636		
Control	3	5	5	100			0				170.68	34.136	1.657				133.82	26.764	1.311		
Control	4	5	5	100			0				172.72	34.544	1.678				130.00	26.000	1.273		
Control	5	5	5	100	100.0	0.0	0	0.0	0.0		204.53	40.906	1.996	1.814	0.16		163.32	32.664	1.606	1.416	0.188
CARR-REF-1	1	5	5	100			0				220.46	44.092	2.155				185.62	37.124	1.829		
CARR-REF-1	2	5	5	100			0				176.26	35.252	1.713				149.46	29.892	1.468		
CARR-REF-1	3	5	5	100			0				184.41	36.882	1.794				151.58	30.316	1.489		
CARR-REF-1	4	5	5	100			0				190.36	38.072	1.854				158.05	31.61	1.554		
CARR-REF-1	5	5	5	100	100.0	0.0	0	0.0	0.0		196.55	39.310	1.916	1.886	0.17		161.63	32.326	1.589	1.586	0.145
CARR-REF-7	1	5	5	100			0				161.61	32.322	1.566				122.41	24.482	1.197		
CARR-REF-7	2	5	5	100			0				154.6	30.920	1.496				121.87	24.374	1.192		
CARR-REF-7	3	5	5	100			0				153	30.600	1.480				105.92	21.184	1.032		
CARR-REF-7	4	5	5	100			0				124.62	24.924	1.197				96.56	19.312	0.939		
CARR-REF-7	5	5	4	80	96.0	8.9	20	4.0	8.9		189.02	47.255	2.313	1.611	0.42		159.97	39.925	1.973	1.267	0.410
SD-70	1	5	5	100			0				208.41	41.682	2.034				172.87	34.574	1.702		
SD-70	2	5	5	100			0				184.33	36.866	1.794				161.15	32.23	1.585		
SD-70	3	5	5	100			0				157.07	31.414	1.521				127.21	25.442	1.245		
SD-70	4	5	5	100			0				183.58	36.716	1.786				156.36	31.272	1.537		
SD-70	5	5	5	100	100.0	0.0	0	0.0	0.0		130.71	26.142	1.257	1.679	0.30		112.15	22.43	1.095	1.433	0.253
SD-71	1	5	5	100			0				168.96	33.792	1.640				149.10	29.82	1.464		
SD-71	2	5	5	100			0				174.02	34.804	1.691				148.97	29.794	1.463		
SD-71	3	5	5	100			0				220.04	44.008	2.151				196.57	39.314	1.939		
SD-71	4	5	5	100			0				172.57	34.514	1.676				146.09	29.218	1.434		
SD-71	5	5	5	100	100.0	0.0	0	0.0	0.0		196.73	39.346	1.918	1.815	0.22		177.38	35.476	1.747	1.609	0.224
SD-72	1	5	5	100			0				132.28	26.456	1.273				117.37	23.474	1.147		
SD-72	2	5	5	100			0				127.46	25.492	1.225				108.13	21.626	1.054		
SD-72	3	5	5	100			0				144.28	28.856	1.393				122.92	24.584	1.202		
SD-72	4	5	5	100			0				138.24	27.648	1.333				117.09	23.418	1.144		
SD-72	5	5	5	100	100.0	0.0	0	0.0	0.0		214.12	42.824	2.092	1.463	0.36		197.57	39.514	1.949	1.299	0.367
SD-73	1	5	5	100			0				120.54	24.108	1.156				98.17	19.634	0.955		
SD-73	2	5	5	100			0				142.81	28.562	1.378				119.43	23.886	1.167		
SD-73	3	5	5	100			0				193.23	38.646	1.883				173.09	34.618	1.704		
SD-73	4	5	5	100			0				72.5	14.500	0.675				56.39	11.278	0.537		
SD-73	5	5	5	100	100.0	0.0	0	0.0	0.0		204.43	40.886	1.995	1.417	0.54		185.26	37.052	1.826	1.238	0.534

20 Day SP Test Survival Summary

CLIENT			PROJECT	PROJECT NUMBER	PROJECT MANAGER	SPECIES													
Pioneer			Olympia Site	PG1661	M. Knowlen	<i>Neanthes arenaceodentata</i>													
Sample ID	Rep	# Initiated	Survival Statistics				Mortality Statistics			Calculated Dry Weights					Calculated Ash Free Dry Weights				
			# Alive	% Survival	Mean Survival (%)	SD	% Mortality	Mean Mortality (%)	SD	Dry Weight per Replicate - Biomass (mg)	Dry Weight per Individual Growth (mg)	Individual Growth Rate (mg/ind/d)	Mean Individual Growth Rate (mg/ind/d)	SD	AFDW per Replicate - Biomass (mg)	AFDW per Individual - Growth (mg)	Individual Growth Rate (mg/ind/d)	Mean Individual Growth Rate (mg/ind/d)	SD
SD-74	1	5	5	100			0			131.58	26.316	1.266			113.96	22.792	1.113		
SD-74	2	5	5	100			0			116.54	23.308	1.116			96.71	19.342	0.940		
SD-74	3	5	5	100			0			75.98	15.196	0.710			60.34	12.068	0.577		
SD-74	4	5	5	100			0			276.77	55.354	2.718			254.41	50.882	2.517		
SD-74	5	5	5	100	100.0	0.0	0	0.0	0.0	93.86	18.772	0.889	1.340	0.80	78.90	15.78	0.762	1.182	0.773
SD-75	1	5	5	100			0			143.96	28.792	1.390			130.13	26.026	1.274		
SD-75	2	5	5	100			0			146.28	29.256	1.413			127.19	25.438	1.245		
SD-75	3	5	5	100			0			154.98	30.996	1.500			138.04	27.608	1.354		
SD-75	4	5	5	100			0			186.54	37.308	1.816			167.20	33.44	1.645		
SD-75	5	5	5	100	100.0	0.0	0	0.0	0.0	171.12	34.224	1.662	1.556	0.18	151.59	30.318	1.489	1.401	0.166

### 20 Day SP Test Day 0 Overlying Ammonia

CLIENT			PROJECT				SPECIES											
Pioneer			Olympia Site				<i>Neanthes arenaceodentata</i>											
Calibration Standards Temperature: 19.6			Date: 12/14/2022	Tech: LG/NL	Ammonia Meter: 10		Sulfide Meter: SPEC 1											
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis <i>measured</i> Total Dissolved Sulfide Sulfide Sample Volume (ml) Sulfide Multiplier <i>Laquearia</i> Total Dissolved Sulfide (µg/L as S) Test salinity (ppt) Test temp (C) Temp (K) NH <sub>3</sub> pKa <sup>s</sup> Unionized NH <sub>3</sub> (mg/L) H <sub>2</sub> S pKa* Undissociated Sulfide (µg/L as H <sub>2</sub> S)																		
Sample	Day	Overlying/ Porewater	Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Total Dissolved Sulfide (µg/L as S)	Test salinity (ppt)	Test pH	Test temp (C)	Temp (K)	NH <sub>3</sub> pKa <sup>s</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa*	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes
Control	0	Overlying	0.373	19.7	T17	0	10	1	0	28	8.0	19.9	293.05	9.26	0.014	6.60	0.000	
CARR-REF-1	0	Overlying	1.21	19.1	T17	ND	10	1	ND	29	8.1	20.1	293.25	9.26	0.057	6.59	ND	
CARR-REF-7	0	Overlying	1.41	19.8	T17	ND	10	1	ND	29	8.0	20.0	293.15	9.26	0.052	6.59	ND	
SD-70	0	Overlying	0.865	19.4	T17	ND	10	1	ND	28	7.9	20.2	293.35	9.26	0.026	6.59	ND	
SD-71	0	Overlying	0.645	19.0	T17	3	10	1	3	28	8.0	20.0	293.15	9.26	0.024	6.60	0.158	
SD-72	0	Overlying	0.645	19.0	T17	ND	10	1	ND	28	8.0	20.6	293.75	9.26	0.025	6.59	ND	
SD-73	0	Overlying	0.111	19.1	T17	9	10	1	9	29	8.0	20.7	293.85	9.26	0.004	6.58	0.462	
SD-74	0	Overlying	0.443	19.3	T17	0.0	10	1	0	28	8.0	20.0	293.15	9.26	0.016	6.60	0.000	
SD-75	0	Overlying	0.533	19.1	T17	2	10	1	2	28	8.0	20.2	293.35	9.26	0.020	6.59	0.105	



20 Day SP Test Day 0 Porewater Ammonia

CLIENT			PROJECT						SPECIES											
Pioneer			Olympia Site						Neanthes arenaceodentata											
Calibration Standards Temperature: 19.6			Date: 12/14/2022		Tech: LG/NL		Ammonia Meter: 10		Sulfide Meter: SPEC 1											
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																				
Sample	Day	Overlying/ Porewater	Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Measured Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Calculated Total Dissolved Sulfide (µg/L as S)	Porewater salinity (ppt)	Porewater pH	Test temp (C)	Temp (K)	NH <sub>3</sub> pKa <sup>s</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa *	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes		
																			Sourced	Sourced
Control	0	Porewater	0.00	19.0	M7/T17	10	10	1.0	10	28	7.5	19.9	293.05	9.26	0.000	6.60	1.504			
CARR-REF-1	0	Porewater	9.84	20.0	M7/T17	ND	10	1.0	ND	30	7.4	20.1	293.25	9.26	0.095	6.59	ND			
CARR-REF-7	0	Porewater	5.93	19.7	M7/T17	29	10	1.0	29	29	7.7	20.0	293.15	9.26	0.113	6.59	2.891			
SD-70	0	Porewater	5.85	19.7	M7/T17	14	10	1.0	14	29	7.7	20.2	293.35	9.26	0.113	6.59	1.386			
SD-71	0	Porewater	4.46	19.1	M7/T17	50	10	1.0	50	29	7.7	20.0	293.15	9.26	0.085	6.59	4.984			
SD-72	0	Porewater	3.05	19.6	M7/T17	ND	10	1.0	ND	29	7.6	20.6	293.75	9.26	0.048	6.58	ND			
SD-73	0	Porewater	2.59	19.3	M7/T17	17	10	1.0	17	29	7.6	20.7	293.85	9.26	0.041	6.58	2.034			
SD-74	0	Porewater	2.35	19.2	M7/T17	ND	10	1.0	ND	28	7.6	20.0	293.15	9.26	0.036	6.60	ND			
SD-75	0	Porewater	2.10	19.4	M7/T17	ND	10	1.0	ND	28	7.6	20.2	293.35	9.26	0.032	6.59	ND			

20 Day SP Test Day 20 Overlying Ammonia

CLIENT			PROJECT						SPECIES										
Pioneer			Olympia Site						Neanthes arenaceodentata										
Calibration Standards Temperature: 19.4			Date: 1/3/2023		Tech: SZ		Ammonia Meter: 10		Sulfide Meter: 1										
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																			
Sample	Day	Overlying/ Porewater	measured				Calculated								Unionized		Undissociated		Notes
			Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Total Dissolved Sulfide (µg/L as S)	Test salinity (ppt)	Test pH	Test temp (C)	Temp (K)	NH <sub>3</sub> pKa <sup>s</sup>	NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa <sup>*</sup>	(µg/L as H <sub>2</sub> S)		
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	
Control	20	Overlying	1.49	19.1	T17	12	10	1	12	29	7.8	20.6	293.75	9.26	0.037	6.58	0.951		
CARR-REF-1	20	Overlying	0.00	19.3	T17	6	10	1	6	30	8.1	20.7	293.85	9.26	0.000	6.58	0.246		
CARR-REF-7	20	Overlying	0.790	19.2	T17	0	10	1	0	29	7.8	20.6	293.75	9.26	0.020	6.58	0.000		
SD-70	20	Overlying	0.00	19.1	T17	ND	10	1	ND	30	8.3	20.6	293.75	9.26	0.000	6.58	ND		
SD-71	20	Overlying	0.00	19.3	T17	ND	10	1	ND	30	8.4	20.7	293.85	9.26	0.000	6.58	ND		
SD-72	20	Overlying	0.00	19.4	T17	ND	10	1	ND	30	8.3	21.3	294.45	9.26	0.000	6.57	ND		
SD-73	20	Overlying	0.00	19.5	T17	4	10	1	4	29	8.1	21.3	294.45	9.26	0.000	6.57	0.161		
SD-74	20	Overlying	0.00	19.3	T17	ND	10	1	ND	30	8.2	20.5	293.65	9.26	0.000	6.58	ND		
SD-75	20	Overlying	0.00	19.4	T17	1	10	1	1	29	8.0	20.9	294.05	9.26	0.000	6.58	0.051		

CLIENT		PROJECT				SPECIES														
Pioneer		Olympia Site				Neanthes arenaceodentata														
Calibration Standards Temperature: 19.4		Date: 1/3/2023	Tech: SZ	Ammonia Meter: 10	Sulfide Meter: 1															
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																				
Sample	Day	Overlying/ Porewater	Measured			Calculated										Unionized		Undissociated		Notes
			Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Total Dissolved Sulfide (µg/L as S)	Porewater salinity (ppt)	Porewater pH	Test temp (C)	Temp (K)	NH <sub>3</sub> pKa <sup>s</sup>	NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa*	(µg/L as H <sub>2</sub> S)			
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Sourced	Calculated	Calculated	Calculated	Calculated		
Control	20	Porewater	2.05	20.3	8/T17	3	10	1	3	30	7.4	20.6	293.75	9.26	0.021	6.58	0.531			
CARR-REF-1	20	Porewater	0.621	20.0	8/T17	3	10	1	3	30	7.4	20.7	293.85	9.26	0.006	6.58	0.530			
CARR-REF-7	20	Porewater	2.35	19.8	8/T17	4	10	1	4	30	7.2	20.6	293.75	9.26	0.015	6.58	1.017			
SD-70	20	Porewater	2.30	19.7	8/T17	28	10	1	28	31	6.9	20.6	293.75	9.26	0.007	6.58	11.314			
SD-71	20	Porewater	0.00	19.5	8/T17	22	10	1	22	30	7.4	20.7	293.85	9.26	0.000	6.58	3.885			
SD-72	20	Porewater	0.0372	19.6	8/T17	ND	10	1	ND	30	7.1	21.3	294.45	9.26	0.000	6.57	ND			
SD-73	20	Porewater	0.00	20.0	8/T17	0	10	1	0	30	7.5	21.3	294.45	9.26	0.000	6.57	0.000			
SD-74	20	Porewater	0.00	19.7	8/T17	43	10	1	43	30	7.0	20.5	293.65	9.26	0.000	6.58	15.125			
SD-75	20	Porewater	0.00	19.5	8/T17	25	10	1	25	30	6.7	20.9	294.05	9.26	0.000	6.58	12.906			

## 2.2 *Neanthes arenaceodentata* Statistical Results





Project Name: Olympia Site: Neanthes Growth

Sample: x1  
 Samp ID: SD-72  
 Alias: P221201.05  
 Replicates: 5  
 Mean: 1.299  
 SD: 0.367  
 Tr Mean: N/A  
 Trans SD: N/A

Ref Samp: x2  
 Ref ID: CARR-REF-1  
 Alias: P221119.02  
 Replicates: 5  
 Mean: 1.586  
 SD: 0.144  
 Tr Mean: N/A  
 Trans SD: N/A

Shapiro-Wilk Results:	Levene's Results:	Test Results:
Residual Mean: 0 Residual SD: 0.181 SS: 0.622 K: 5 b: 0.689  Alpha Level: 0.05 Calculated Value: 0.7617 Critical Value: $\leq 0.842$  Normally Distributed: No  Override Option: Not Invoked	Test Residual Mean: 0.26 Test Residual SD: 0.224 Ref. Residual Mean: 0.099 Ref. Residual SD: 0.093 Deg. of Freedom: 8  Alpha Level: 0.1 Calculated Value: 1.4851 Critical Value: $\geq 1.860$  Variances Homogeneous: Yes	Statistic: Mann-Whitney Balanced Design: Yes Transformation: rank-order  Experimental Hypothesis Null: $x1 \geq x2$ Alternate: $x1 < x2$  Mann-Whitney N1: 5 Mann-Whitney N2: 5 Degrees of Freedom: Experimental Alpha Level: 0.05 Calculated Value: 20 Critical Value: $\geq 21.000$ Accept Null Hypothesis: Yes  Power: Min. Difference for Power:

Replicate Number	Test Data	Trans. Test Data	Reference Data	Trans. Reference Data	Levene's Test Residuals	Levene's Reference Residuals	Mann-Whitney Ranks	Rankits	Shapiro-Wilk Residuals
1	1.147	3	1.829	9	0.152	0.243	1		-0.245
2	1.054	1	1.468	5	0.245	0.118	2		-0.155
3	1.202	4	1.489	6	0.097	0.097	3		-0.152
4	1.144	2	1.554	7	0.155	0.032	4		-0.118
5	1.949	10	1.589	8	0.65	0.003	5		-0.097
6							6		-0.097
7							7		-0.032
8							8		0.003
9							9		0.243
10							10		0.65







Bio-Stat

File Edit Log Options Help

### Project Information

Project Name: Olympia Site: Neanthes Growth

---

#### Test Data (x1)

Sample ID: SD-74

Alias: P221201.07

Rep	Data	Transform
1	1.113	0.32490
2	0.940	0.29700
3	0.577	0.19783
4	2.517	0.54617
5	0.762	0.24601

#### Reference Data (x2)

Reference ID: CARR-REF-1

Alias: P221113.02

Rep	Data	Transform
1	1.829	0.45163
2	1.468	0.39235
3	1.489	0.39602
4	1.554	0.40722
5	1.588	0.41313

### Messages

Conducting Student's t-Test  
 \*\*\* Stats complete  
 \*\*\* Executing Stats...  
 Conducting Shapiro-Wilk Normality Test...  
 Conducting Levene's Homoscedasticity Test

---

### Statistical Results

Test Treatment		Reference Treatment	
Number of Repts:	5	Number of Repts:	5
Test Mean:	1.182	Reference Mean:	1.586
Test SD:	0.773	Reference SD:	0.144
Transform Mean:	0.321	Transform Mean:	0.412
Transform SD:	0.135	Transform SD:	0.024

---

Normality [Shapiro-Wilk]	Homoscedasticity [Levene's]
Critical W Value: $\leq 0.842$	Critical Student's t: $\geq 1.850$
Calculated W Value: 0.8243	Calculated Student's t: 1.9173
Alpha: 0.05	Alpha: 0.1
Normal: <b>X</b>	Homoscedastic: <b>X</b>

---

### Test of Experimental Hypothesis

Statistic: \_\_\_\_\_ Calculated Statistic: \_\_\_\_\_

Critical Value: \_\_\_\_\_ Transform Type: Log10 (x + 1.0)

Alpha Level: \_\_\_\_\_ df: \_\_\_\_\_

Powers: \_\_\_\_\_ Accept Null Hypothesis: **?**

Statistics Status

**i** Data is neither normal nor homoscedastic. Rankit transformation will be performed.

OK

Transformation Method

Log10 (x + 1.0)

---

Experimental Alpha Level

0.05

**Execute Statistics**

Experimental Hypothesis

Null:  $x1 >= x2$

Alternate:  $x1 < x2$

BioStat input and error message for sample SD-74 for Neanthes growth



### **2.3     *Neanthes arenaceodentata* Reference Toxicant Test Results**



Reference Toxicant 96-h Acute Survival Test

All Matching Labs

Test Type: Survival

Organism: Neanthes arenaceodentata (Polycha

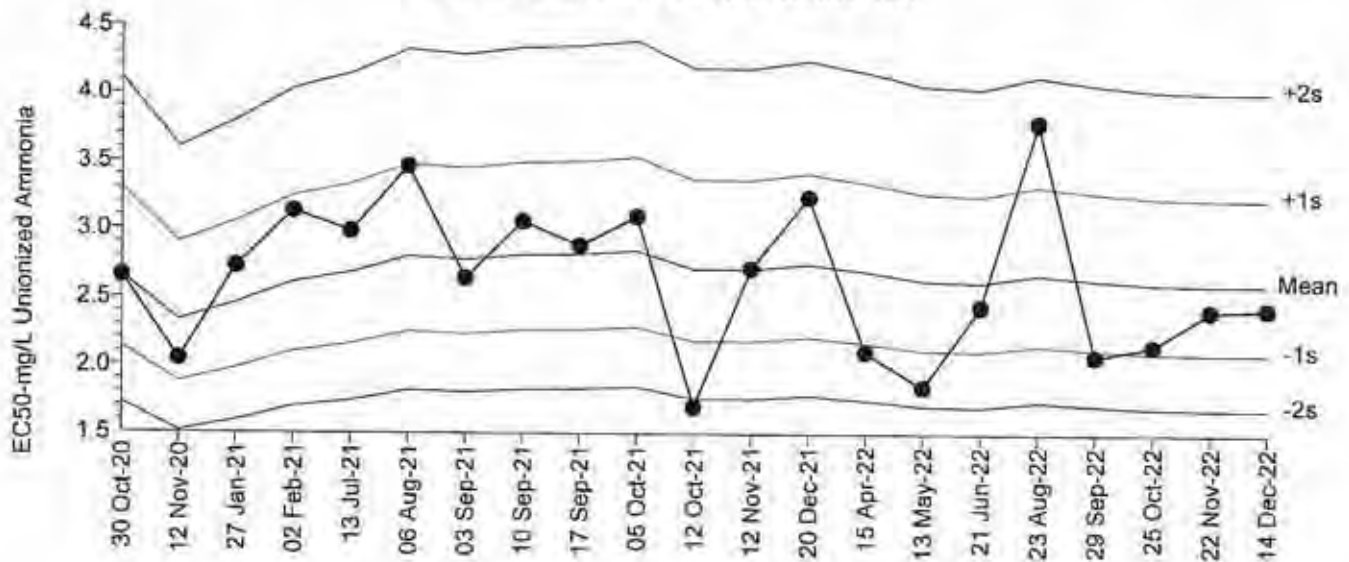
Material: Unionized Ammonia

Protocol: All Protocols

Endpoint: Proportion Survived

Source: Reference Toxicant-REF

Reference Toxicant 96-h Acute Survival Test



Mean: 2.603      Count: 20      -1s Warning Limit: 2.094      -2s Action Limit: 1.685  
 Sigma: n/a      CV: 22.00%      +1s Warning Limit: 3.235      +2s Action Limit: 4.021

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2020	Oct	30	14:30	2.658	0.05565	0.09731			01-3731-2040	11-2351-8876	EcoAnalysts
2		Nov	12	13:15	2.049	-0.5538	-1.1	(-)		12-9901-3703	05-8140-5916	EcoAnalysts
3	2021	Jan	27	15:00	2.728	0.1251	0.2159			12-9968-3998	00-2755-1557	EcoAnalysts
4		Feb	2	15:30	3.136	0.5332	0.8572			12-0475-2746	18-0917-0562	EcoAnalysts
5		Jul	13	12:50	2.985	0.3822	0.6302			07-4298-1789	21-1474-3341	EcoAnalysts
6		Aug	6	14:30	3.47	0.8668	1.322	(+)		17-3928-7243	16-3530-0376	EcoAnalysts
7		Sep	3	14:56	2.643	0.04056	0.07112			00-9699-3848	20-5821-4212	EcoAnalysts
8			10	14:57	3.06	0.457	0.744			10-0722-2402	10-1825-7993	EcoAnalysts
9			17	15:48	2.883	0.28	0.4699			02-1817-2962	14-0572-3774	EcoAnalysts
10		Oct	5	15:15	3.097	0.4938	0.799			04-8116-7560	08-2878-7495	EcoAnalysts
11			12	13:47	1.696	-0.9069	-1.971	(-)		00-1874-7376	16-5756-9380	EcoAnalysts
12		Nov	12	11:27	2.719	0.1164	0.2012			10-4242-2850	01-8554-2307	EcoAnalysts
13		Dec	20	11:01	3.244	0.6409	1.013	(+)		05-2220-5478	10-7291-5872	EcoAnalysts
14	2022	Apr	15	15:04	2.108	-0.4952	-0.9708			11-0641-2289	03-7517-0691	EcoAnalysts
15		May	13	15:24	1.848	-0.7544	-1.574	(-)		03-9000-1315	01-4943-0350	EcoAnalysts
16		Jun	21	15:45	2.443	-0.1602	-0.2923			19-7550-0810	15-1612-6650	EcoAnalysts
17		Aug	23	14:08	3.798	1.196	1.739	(+)		07-0648-9473	01-5439-6552	EcoAnalysts
18		Sep	29	15:28	2.077	-0.5255	-1.038	(-)		01-5105-1781	06-0424-1990	EcoAnalysts
19		Oct	25	13:00	2.154	-0.4486	-0.8702			14-7727-6578	02-8812-8427	EcoAnalysts
20		Nov	22	18:45	2.416	-0.1865	-0.342			07-9444-9163	00-9445-7280	EcoAnalysts
21		Dec	14	15:25	2.43	-0.1723	-0.3151			09-0689-0078	04-1997-4862	EcoAnalysts



# CETIS Summary Report

Report Date: 27 Dec-22 16:09 (p 1 of 11)  
 Test Code/ID: P220819.15 / 18-3309-9140

## Reference Toxicant 96-h Acute Survival Test

EcoAnalysts

Batch ID: 13-1040-3546	Test Type: Survival	Analyst:
Start Date: 14 Dec-22 15:25	Protocol: PSEP (1995)	Diluent: Laboratory Seawater
Ending Date: 18 Dec-22 16:33	Species: Neanthes arenaceodentata	Brine: Not Applicable
Test Length: 4d 1h	Taxon: Polychaeta	Source: Aquatic Toxicology Support Age:
Sample ID: 06-4795-8160	Code: P220819.15	Project: Reference Toxicant
Sample Date: 19 Aug-22	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 19 Aug-22	CAS (PC):	Station: P220819.15
Sample Age: 117d 15h	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
15-4379-0630	Proportion Survived	Dunnett Multiple Comparison Test	107	206	148.5		17.0%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg/L	95% LCL	95% UCL	TU	S
14-3636-0481	Proportion Survived	Spearman-Kärber	EC50	214.8	197	234.3		1

## Proportion Survived Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9667	0.8232	1.0000	0.9000	1.0000	0.0333	0.0577	5.97%	0.00%
56.4		3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%
107		3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%
206		3	0.7000	0.2032	1.0000	0.5000	0.9000	0.1155	0.2000	28.57%	27.59%
304		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
412		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

## Proportion Survived Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	1.0000	0.9000
56.4		1.0000	1.0000	1.0000
107		1.0000	1.0000	1.0000
206		0.9000	0.7000	0.5000
304		0.0000	0.0000	0.0000
412		0.0000	0.0000	0.0000

## Proportion Survived Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	10/10	10/10	9/10
56.4		10/10	10/10	10/10
107		10/10	10/10	10/10
206		9/10	7/10	5/10
304		0/10	0/10	0/10
412		0/10	0/10	0/10

**CETIS Test Data Worksheet**

Report Date: 27 Dec-22 16:08 (p 1 of 1)  
 Test Code/ID: P220819.15 / 18-3309-9140

Reference Toxicant 96-h Acute Survival Test				EcoAnalysts		
Start Date:	14 Dec-22 15:25	Species:	Neanthes arenaceodentata	Sample Code:	P220819.15	
End Date:	18 Dec-22 16:33	Protocol:	PSEP (1995)	Sample Source:	Reference Toxicant	
Sample Date:	19 Aug-22	Material:	Total Ammonia	Sample Station:	P220819.15	
Conc-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	3	10	10	
0	D	2	17	10	10	
0	D	3	15	10	9	
56.4		1	10	10	10	
56.4		2	6	10	10	
56.4		3	2	10	10	
107		1	5	10	10	
107		2	9	10	10	
107		3	13	10	10	
206		1	16	10	9	
206		2	12	10	7	
206		3	7	10	5	
304		1	4	10	0	
304		2	8	10	0	
304		3	18	10	0	
412		1	1	10	0	
412		2	11	10	0	
412		3	14	10	0	

# CETIS Summary Report

Report Date: 27 Dec-22 16:12 (p 1 of 1)  
 Test Code/ID: P220819.15UIA / 09-0689-0078

## Reference Toxicant 96-h Acute Survival Test

EcoAnalysts

Batch ID: 13-1040-3546	Test Type: Survival	Analyst:
Start Date: 14 Dec-22 15:25	Protocol: PSEP (1995)	Diluent: Laboratory Seawater
Ending Date: 18 Dec-22 16:33	Species: Nereis acedentata	Brine: Not Applicable
Test Length: 4d 1h	Taxon: Polychaeta	Source: Aquatic Toxicology Support Age:
Sample ID: 05-5440-0056	Code: P220819.15UIA	Project: Reference Toxicant
Sample Date: 19 Aug-22	Material: Unionized Ammonia	Source: Reference Toxicant
Receipt Date: 19 Aug-22	CAS (PC):	Station: P220819.15UIA
Sample Age: 117d 15h	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
00-7339-1224	Proportion Survived	Dunnett Multiple Comparison Test	1.597	2.45	1.978		17.0%	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg/L	95% LCL	95% UCL	TU	S
04-1997-4862	Proportion Survived	Spearmen-Kärber	EC50	2.43	2.316	2.551		1

## Proportion Survived Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9667	0.8232	1.0000	0.9000	1.0000	0.0333	0.0577	5.97%	0.00%
1.048		3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%
1.597		3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-3.45%
2.45		3	0.7000	0.2032	1.0000	0.5000	0.9000	0.1155	0.2000	28.57%	27.59%
2.858		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
3.105		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

## Proportion Survived Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	1.0000	0.9000
1.048		1.0000	1.0000	1.0000
1.597		1.0000	1.0000	1.0000
2.45		0.9000	0.7000	0.5000
2.858		0.0000	0.0000	0.0000
3.105		0.0000	0.0000	0.0000

## Proportion Survived Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	10/10	10/10	9/10
1.048		10/10	10/10	10/10
1.597		10/10	10/10	10/10
2.45		9/10	7/10	5/10
2.858		0/10	0/10	0/10
3.105		0/10	0/10	0/10

**CETIS Test Data Worksheet**

Report Date: 27 Dec-22 16:11 (p 1 of 1)  
 Test Code/ID: P220819.15UIA / 09-0689-0078

**Reference Toxicant 96-h Acute Survival Test**

EcoAnalysts

Start Date: 14 Dec-22 15:25    Species: Neanthes arenaceodentata    Sample Code: P220819.15UIA  
 End Date: 18 Dec-22 16:33    Protocol: PSEP (1995)    Sample Source: Reference Toxicant  
 Sample Date: 19 Aug-22    Material: Unionized Ammonia    Sample Station: P220819.15UIA

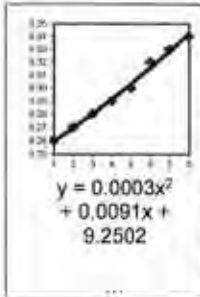
Conc-mg/L	Code	Rep	Pos	# Exposed	# Survived	Notes
0	D	1	7	10	10	
0	D	2	5	10	10	
0	D	3	10	10	9	
1.048		1	2	10	10	
1.048		2	8	10	10	
1.048		3	1	10	10	
1.597		1	17	10	10	
1.597		2	12	10	10	
1.597		3	6	10	10	
2.45		1	9	10	9	
2.45		2	11	10	7	
2.45		3	14	10	5	
2.858		1	13	10	0	
2.858		2	4	10	0	
2.858		3	3	10	0	
3.105		1	15	10	0	
3.105		2	16	10	0	
3.105		3	18	10	0	

# Un-ionized Ammonia Calculator

CLIENT:	Pioneer	Date of Test:	December 14 <sup>①</sup> 2022
PROJECT:	Olympia Site	Test Type:	Neanthes RT
COMMENTS:	P220819.15		

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature, and pH.

Ionic strength:pKa <sup>a</sup>	
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34



Sample	Mod	NH3T (mg/L)	salinity (ppt)	pH	temp (C)	temp (K)	pKa <sup>a</sup>	NH <sub>3</sub> U (mg/L)
Target / Sample Name		Actual	Actual	Actual	Actual	Calculated	Calculated	Calculated
Example 3.5		2.000	10.0	7.5	5.0	278.15	9.2520	0.008
1								
2								
3	50	50.4	29	7.7	19.7	292.85	9.2557	1.048
4	100	107	28	7.6	19.8	292.95	9.2557	1.597
5	200	206	29	7.5	19.8	292.95	9.2557	2.450
6	300	304	28	7.4	19.7	292.85	9.2557	2.858
7	400	412	29	7.3	19.8	292.95	9.2557	3.105
8								
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①WD L17.23 MARU

QA ✓ MARU

## Ammonia Reference Toxicant Test Survival Data Sheet

CLIENT <b>Pioneer</b>	PROJECT <b>Olympia Site</b>	SPECIES <b>Neanthes arenaceodentata</b>	LABORATORY <b>Port Gamble</b>
TEST ID <b>P220919.15</b>	LOT #: <b>22E3156086</b>	TEST START DATE <b>12/14/22</b>	TIME <b>1525 ML</b>
CHAMBER SIZE/TYPE <b>Glass pint jar</b>	EXPOSURE VOLUME <b>250 mL</b>	4-DAY END DATE <b>12/18/22</b>	PROTOCOL <b>PSEP</b> TIME <b>LG 1633</b>

### WATER QUALITY DATA

TEST CONDITIONS				DO (mg/L)		TEMP(C)		SAL (ppt)		pH		TECHNICIAN	AMMONIA		SULFIDES		
				> 4.6		20 ± 1		28 ± 2		7 - 9							
CLIENT/ENVIRON ID	CONCENTRATION		DAY	REP	D.O.		TEMP.		SALINITY		pH		WQ TECH/ DATE	AMMONIA		SULFIDES	
	value	units			meter	mg/L	meter	°C	meter	ppt	meter	unit		METER	mg/L	Tech	meter
Ref.Tox.-ammonia	0	mg/L	0	Stock	9	7.5	9	19.8	9	28	9	7.7	NL 12/14	10	0.00		NL
			4	1	8	7.4	8	20.8	8	29	8	8.0	LG 12/18				
Ref.Tox.-ammonia	50	mg/L	0	Stock	9	7.5	9	19.7	9	29	9	7.7	NL 12/14	10	56.4		NL
			4	1	8	7.4	8	20.8	8	29	8	8.0	LG 12/18				
Ref.Tox.-ammonia	100	mg/L	0	Stock	9	7.5	9	19.8	9	29	9	7.6	NL 12/14	10	107		NL
			4	1	8	7.3	8	20.8	8	29	8	7.9	LG 12/18				
Ref.Tox.-ammonia	200	mg/L	0	Stock	9	7.5	9	19.8	9	29	9	7.5	NL 12/14	10	206		NL
			4	1	8	7.4	8	20.7	8	29	8	7.8	LG 12/18				
Ref.Tox.-ammonia	300	mg/L	0	Stock	9	7.5	9	19.7	9	29	9	7.4	NL 12/14	10	304		NL
			4	1	8	7.2	8	20.8	8	30	8	7.7	LG 12/18				
Ref.Tox.-ammonia	400	mg/L	0	Stock	9	7.5	9	19.8	9	29	9	7.3	NL 12/14	10	412		NL
			4	1	8	-	8	-	8	-	8	-	LG 12/18				

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# Ammonia Reference Toxicant Test Survival Data Sheet

P220819.15			SPECIES <i>Neanthes arenaceodentata</i>		
CLIENT Pioneer	PROJECT Olympia Site	TEST ID P220819.15	PROJECT MANAGER M. Knowlen	LABORATORY Port Gamble	PROTOCOL PSEP

## SURVIVAL & BEHAVIOR DATA

<b>OBSERVATION KEY</b> N = Normal LOE = Loss of equilibrium Q = Quiescent DC = Discoloration NB = No body F = Floating on surface				DAY 1			DAY 2			DAY 3			DAY 4			
				DATE			DATE			DATE			DATE			
				TECHNICIAN			TECHNICIAN			TECHNICIAN			TECHNICIAN			
INITIAL # OF ORGANISMS 10				12/15/22			12/16/22			12/17/22			12/18/22			
				MK			MK			MK			UG			
CLIENT/ENVIRON ID	CONC.		REP	INITIAL NUMBER	#ALIVE : #DEAD : OBS			#ALIVE : #DEAD : OBS			#ALIVE : #DEAD : OBS			#ALIVE : #DEAD : OBS		
	value	units			#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS	#ALIVE	#DEAD	OBS
Ref.Tox.- Ammonia	0 mg/L		1	10	10	0	N	10	0	N	10	0	N	10	0	N
			2	10	10	0	N	10	0	N	10	0	N	10	0	N
			3	10	10	0	N	10	0	N	10	0	N	9	0	NB
Ref.Tox.- Ammonia	50 mg/L		1	10	10	0	N	10	0	N	10	0	N	10	0	N
			2	10	10	0	N	10	0	N	10	0	N	10	0	N
			3	10	10	0	N	10	0	N	10	0	N	10	0	N
Ref.Tox.- Ammonia	100 mg/L		1	10	10	0	N	10	0	N	10	0	Q	10	0	N
			2	10	10	0	N	10	0	N	10	0	Q	0	0	N
			3	10	10	0	N	10	0	N	10	0	Q	10	0	N
Ref.Tox.- Ammonia	200 mg/L		1	10	10	0	Q	10	0	Q	10	0	Q	9	1	Q
			2	10	10	0	Q	10	0	Q	10	0	Q	7	3	Q
			3	10	10	0	Q	10	0	Q	9	1	Q	5	4	Q
Ref.Tox.- Ammonia	300 mg/L		1	10	10	0	Q	2	8	Q	2	0	Q	0	2	DC
			2	10	10	0	Q	6	4	Q	3	3	Q	0	3	DC
			3	10	10	0	Q	8	2	Q	8	0	Q	0	8	DC
Ref.Tox.- Ammonia	400 mg/L		1	10	0	10	-	/			/			/		
			2	10	0	10	-	/			/			/		
			3	10	0	10	-	/			/			/		

① W.C. MK 12/16.

**Ammonia Reference Toxicant  
Spiking Worksheet**

Reference Toxicant ID: P220819.15  
 Date Prepared: 12/14/22  
 Technician Initials: NL

# Neanthes NH<sub>3</sub> RT

Assumptions in Model Date: 12/13/2022  
 Stock ammonia concentration is 10,000 mg/L = 10 mg/mL Measurement: 9057

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration	Desired Concentration	Volume	mL stock to increase	
mg/L	mg/L	mL	FRESH WATER (mL)	SALT WATER (mL)
56.4	50	750		6.21
107	100	750		12.42
206	200	750		24.84
304	300	750		37.27
412	400	750		49.69

### 3. *Mytilus galloprovincialis* Water-Column Test

### 3.1 *Mytilus galloprovincialis* Test Data

**GENERAL**

<b>Client</b>	Pioneer
<b>Project</b>	Olympia Site
<b>Project Number</b>	PG1661
<b>Project Manager</b>	M. Knowlen
<b>Date Sample Collected (Oldest Sample)</b>	11/18/2022
<b>Sample Holding Time</b>	19
<b>Test Start Date</b>	12/07/22
<b>Test End Date</b>	12/09/22
<b>Test Species</b>	<i>Mytilus galloprovincialis</i>
<b>Organism Supplier</b>	Taylor Shellfish
<b>Date Organism Acquired</b>	9/20/2022 & 12/6/22
<b>Organism Acclimation Time (Days)</b>	#VALUE!
<b>Organism Batch</b>	TS092022 & TS120622.01
<b>Test Type</b>	Sediment Larval
<b>Test Protocol</b>	PSEP 1995
<b>Regional Protocol</b>	SCUM 2021
<b>Laboratory Location</b>	Port Gamble
<b>Test Location</b>	Bath 4
<b>Sample Treatment</b>	Test samples sieved 4mm, CARR-REF-7 sieved 2mm
<b>UV Light Treatment</b>	No
<b>Resuspension</b>	Yes
<b>Aeration from test initiation</b>	Yes
<b>Control Sediment Source (if applicable)</b>	None
<b>Water Batch</b>	FSW120722.01
<b>Test Lighting</b>	14:10 L:D
<b>Test Chamber</b>	1L glass chamber
<b>Replicates Per Treatment</b>	5
<b>Exposure Volume</b>	18g sediment/900 mL seawater
<b>Test Dissolved Oxygen</b>	> 5
<b>Test Temperature</b>	16 ± 1
<b>Test Salinity</b>	28 ± 1
<b>Test pH</b>	8.25 ± 0.75

Test Parameters		
	Min	Max
<b>DO:</b>	5	
<b>Temp:</b>	15	17
<b>Sal:</b>	27	29
<b>pH:</b>	7.5	9

Note: input lowest and highest decimal for temp

<b>TEST START TIME:</b>	16:48
<b>TEST END TIME:</b>	16:40

	CLIENT SAMPLE ID	LAB ID
Control 1	Control	.
Control 2 (if used) or reference	CARR-REF-1	P221119.02
3	CARR-REF-7	P221119.08
4	SD-70	P221201.03
5	SD-71	P221201.04
6	SD-72	P221201.05
7	SD-73	P221201.06
8	SD-74	P221201.07
9	SD-75	P221201.08
10	.	.
11	.	.
12	.	.
13	.	.
14	.	.
15	.	.
16	.	.
17	.	.
18	.	.
19	.	.
20	.	.
21	.	.

CLIENT Pioneer	PROJECT Olympia Site	JOB NUMBER PG1661	PROJECT MANAGER M. Knowlen	LABORATORY Port Gamble, Bath 4	PROTOCOL PSEP 1995, SCUM 2021
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#### TEST ORGANISM SPAWNING DATA

SPECIES <i>Mytilus galloprovincialis</i>			TEST START DATE 7-Dec-22
SUPPLIER Taylor Shellfish			ORGANISM BATCH TS092022 & TS120622.01
SPAWNING METHOD Heat Shock		INITIAL SPAWNING TIME 1406	FINAL SPAWNING TIME 1457
MALES 2	FEMALES 6	SPERM VIABILITY GOOD	EGG CONDITION GOOD
BEGIN FERTILIZATION 1457	END FERTILIZATION 1648		CONDITION OF EMBRYOS GOOD

SEDIMENT TREATMENT Test samples sieved 4mm, CARR-REF-7 sieved 2mm	
TEST CHAMBERS 1L glass chamber	
EXPOSURE VOLUME 18g sediment/900 mL seawater	INITIALS
TIME OF SHAKE 12:18	INITIALS NL
TIME OF INITIATION 16:48	INITIALS DM/SZ
ROSE BENGAL LOT # 0:00	FORMALIN LOT # 220304-50

#### SPECIAL CONDITIONS

UV LIGHT EXPOSURE (YES/NO) No	AERATION FROM TEST INITIATION (YES/NO) Yes
RESUSPENSION (YES/NO) Yes	OTHER (EXPLAIN)

#### EMBRYO DENSITY CALCULATIONS

No. of embryos in 1 mL of 100x diluted stock 168
mL of original embryo stock added to each test chamber 1.61

### Sediment Larval Test WQ Data Sheet

CLIENT		PROJECT		SPECIES		LOCATION		PROTOCOL			
Pioneer		Olympia Site		<i>Mytilus galloprovincialis</i>		Port Gamble / Bath 4		PSEP 1995 , SCUM 2021			
PROJECT MANAGER		TEST TYPE		Project Number		TEST START DATE		TIME		INITIALS	
M. Knowlen		Sediment Larval		PG1661		December 7, 2022		16:48		December 9, 2022 16:40 DM/MS	
WATER QUALITY DATA											
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes
							> 5	15 - 17	27 - 29	7.5 - 9	
Control	0	Surr	8	NL	12/07/22	7	8.2	16.7	28	7.8	
Control	1	Surr	8	NL	12/08/22	8	7.9	17.0	28	8.0	
Control	2	Surr	8	BH	12/09/22	7	7.9	16.5	28	8.0	
Control	3	Surr	8								
Control	4	Surr	8								
CARR-REF-1	0	Surr	13	NL	12/07/22	7	8.0	16.8	28	7.8	
CARR-REF-1	1	Surr	13	NL	12/08/22	8	7.3	17.0	28	7.9	
CARR-REF-1	2	Surr	13	BH	12/09/22	7	7.4	16.6	28	7.8	
CARR-REF-1	3	Surr	13								
CARR-REF-1	4	Surr	13								
CARR-REF-7	0	Surr	45	NL	12/07/22	7	7.9	17.2	28	7.8	
CARR-REF-7	1	Surr	45	NL	12/08/22	8	7.7	17.6	28	7.8	Bath temp is the lowest temp acheivable. Chamber was moved in bath to decrease its temp.-NL 12/8
CARR-REF-7	2	Surr	45	BH	12/09/22	7	7.2	16.9	28	7.8	
CARR-REF-7	3	Surr	45								
CARR-REF-7	4	Surr	45								
SD-70	0	Surr	25	NL	12/07/22	7	8.0	16.3	28	7.9	
SD-70	1	Surr	25	NL	12/08/22	8	7.7	17.2	28	7.9	
SD-70	2	Surr	25	BH	12/09/22	7	6.7	16.7	28	7.9	
SD-70	3	Surr	25								
SD-70	4	Surr	25								



### Sediment Larval Test WQ Data Sheet

CLIENT		PROJECT		SPECIES			LOCATION		PROTOCOL			
Pioneer		Olympia Site		<i>Mytilus galloprovincialis</i>			Port Gamble / Bath 4		PSEP 1995 , SCUM 2021			
PROJECT MANAGER		TEST TYPE		Project Number			TEST START DATE		TIME	TEST END DATE	TIME	INITIALS
M. Knowlen		Sediment Larval		PG1661			December 7, 2022		16:48	December 9, 2022	16:40	DM/MS
WATER QUALITY DATA												
SAMPLE ID	DAY	REP	JAR #	TECHNICIAN	Date	Meter	DO (mg/L)	TEMP (°C)	SALINITY (ppt)	pH	Notes	
							> 5	15 - 17	27 - 29	7.5 - 9		
SD-71	0	Surr	4	NL	12/07/22	7	8.0	16.4	28	7.9		
SD-71	1	Surr	4	NL	12/08/22	8	7.9	16.7	28	8.0		
SD-71	2	Surr	4	BH	12/09/22	7	7.5	16.6	28	7.9		
SD-71	3	Surr	4									
SD-71	4	Surr	4									
SD-72	0	Surr	23	NL	12/07/22	7	8.1	16.3	28	7.9		
SD-72	1	Surr	23	NL	12/08/22	8	7.9	16.4	28	8.0		
SD-72	2	Surr	23	BH	12/09/22	7	7.9	16.4	28	8.0		
SD-72	3	Surr	23									
SD-72	4	Surr	23									
SD-73	0	Surr	11	NL	12/07/22	7	8.0	16.6	28	7.8		
SD-73	1	Surr	11	NL	12/08/22	8	8.0	17.0	28	8.0		
SD-73	2	Surr	11	BH	12/09/22	7	8.0	16.5	28	8.0		
SD-73	3	Surr	11									
SD-73	4	Surr	11									
SD-74	0	Surr	52	NL	12/07/22	7	8.0	16.5	28	7.9		
SD-74	1	Surr	52	NL	12/08/22	8	7.6	16.9	28	8.0		
SD-74	2	Surr	52	BH	12/09/22	7	8.0	16.4	28	8.0		
SD-74	3	Surr	52									
SD-74	4	Surr	52									
SD-75	0	Surr	51	NL	12/07/22	7	8.0	16.8	28	7.9		
SD-75	1	Surr	51	NL	12/08/22	8	7.4	17.4	28	7.9		
SD-75	2	Surr	51	BH	12/09/22	7	7.4	16.5	28	7.9		
SD-75	3	Surr	51									
SD-75	4	Surr	51									

## Sediment Larval Test Summary

CLIENT		PROJECT				PROJECT NUMBER	
Pioneer		Olympia Site				PG1661	
PROJECT MANAGER		TEST TYPE				SPECIES	
M. Knowlen		Sediment Larval				<i>Mytilus galloprovincialis</i>	
LARVAL ENDPOINT DATA							
Sample ID	Rep	# Normal	# Abnormal	Total	Date	Tech	Comments / QA Counts
Stocking Density	1			279	12/19/22	MK	
Stocking Density	2			331	12/19/22	MK	
Stocking Density	3			315	12/19/22	MK	
Stocking Density	4			298	12/19/22	MK	
Stocking Density	5			314	12/19/22	MK	
Control	1	285	3	288	12/19/22	MK	
Control	2	289	1	290	12/19/22	MK	QA: 289N 1AB, % change: 0 DM 1/9/23
Control	3	301	2	303	12/19/22	MK	
Control	4	298	4	302	12/19/22	MK	
Control	5	276	0	276	12/19/22	MK	
CARR-REF-1	1	207	14	221	12/19/22	MK	
CARR-REF-1	2	279	4	283	12/19/22	MK	
CARR-REF-1	3	257	21	278	12/19/22	MK	
CARR-REF-1	4	192	35	227	12/19/22	MK	Backup vial similar (201N 14A)
CARR-REF-1	5	212	26	238	12/19/22	MK	
CARR-REF-7	1	284	2	286	12/19/22	MK	
CARR-REF-7	2	238	2	240	12/19/22	MK	
CARR-REF-7	3	233	1	234	12/19/22	MK	
CARR-REF-7	4	369	4	373	12/19/22	MK	Confirmed count, backup vial similar (366N 7A)
CARR-REF-7	5	248	2	250	12/19/22	MK	
SD-70	1	270	10	280	12/19/22	MK	
SD-70	2	278	4	282	12/19/22	MK	
SD-70	3	273	2	275	12/19/22	MK	
SD-70	4	269	4	273	12/19/22	MK	QA: 271N 2A, % change: 0.8% DM 1/10/23
SD-70	5	265	1	266	12/19/22	MK	
SD-71	1	234	3	237	12/19/22	MK	
SD-71	2	256	1	257	12/19/22	MK	
SD-71	3	262	2	264	12/19/22	MK	
SD-71	4	251	4	255	12/20/22	MK	
SD-71	5	272	2	274	12/20/22	MK	
SD-72	1	218	8	226	12/19/22	MK	
SD-72	2	250	3	253	12/19/22	MK	
SD-72	3	277	3	280	12/19/22	MK	
SD-72	4	284	3	287	12/20/22	MK	QA: 278N 5A, % change: 0.8% DM 1/9/23

## Sediment Larval Test Summary

<b>CLIENT</b> Pioneer		<b>PROJECT</b> Olympia Site			<b>PROJECT NUMBER</b> PG1661		
<b>PROJECT MANAGER</b> M. Knowlen		<b>TEST TYPE</b> Sediment Larval			<b>SPECIES</b> <i>Mytilus galloprovincialis</i>		
LARVAL ENDPOINT DATA							
Sample ID	Rep	# Normal	# Abnormal	Total	Date	Tech	Comments / QA Counts
SD-72	5	284	4	288	12/20/22	MK	
SD-73	1	252	5	257	12/19/22	MK	
SD-73	2	251	5	256	12/20/22	MK	
SD-73	3	233	2	235	12/20/22	MK	
SD-73	4	230	14	244	12/20/22	MK	
SD-73	5	214	16	230	12/20/22	MK	
SD-74	1	237	6	243	12/19/22	MK	
SD-74	2	111	3	114	12/20/22	MK	Backup vial used (initial vial 109N 0A). Chamber understocked
SD-74	3	238	8	246	12/20/22	MK	
SD-74	4	263	1	264	12/20/22	MK	QA: 258N 6A, % change: 1.9% DM 1/10/23
SD-74	5	227	13	240	12/20/22	MK	
SD-75	1	238	23	261	12/19/22	MK	
SD-75	2	257	10	267	12/19/22	MK	
SD-75	3	220	18	238	12/20/22	MK	
SD-75	4	239	4	243	12/20/22	MK	
SD-75	5	238	2	240	12/20/22	MK	QA: 246N 1A, % change: 0.4% DM 1/10/23

## Sediment Larval Test Summary

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>PROJECT NUMBER</b> PG1661
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE</b> Sediment Larval	<b>SPECIES</b> <i>Mytilus galloprovincialis</i>

### LARVAL ENDPOINT DATA

Sample ID	Rep	Normal	Abnormal	Total	Mean # Normal	SD	Average Control Normal Survival (Nc/I)	# Normal Relative to Control 1	Average # Normal Relative to Control 1
Stocking Density	1			279					
Stocking Density	2			331					
Stocking Density	3			315					
Stocking Density	4			298					
Stocking Density	5			314	307.4	19.7			
Control	1	285	3	288					
Control	2	289	1	290					
Control	3	301	2	303					
Control	4	298	4	302					
Control	5	276	0	276	289.8	10.1	0.94		
CARR-REF-1	1	207	14	221				0.71	
CARR-REF-1	2	279	4	283				0.96	
CARR-REF-1	3	257	21	278				0.89	
CARR-REF-1	4	192	35	227				0.66	
CARR-REF-1	5	212	26	238	229.4	36.8	0.75	0.73	0.79
CARR-REF-7	1	284	2	286				0.98	
CARR-REF-7	2	238	2	240				0.82	
CARR-REF-7	3	233	1	234				0.80	
CARR-REF-7	4	369	4	373				1.27	
CARR-REF-7	5	248	2	250	274.4	56.5		0.86	0.95
SD-70	1	270	10	280				0.93	
SD-70	2	278	4	282				0.96	
SD-70	3	273	2	275				0.94	
SD-70	4	269	4	273				0.93	
SD-70	5	265	1	266	271.0	4.8		0.91	0.94
SD-71	1	234	3	237				0.81	
SD-71	2	256	1	257				0.88	
SD-71	3	262	2	264				0.90	
SD-71	4	251	4	255				0.87	
SD-71	5	272	2	274	255.0	14.1		0.94	0.88
SD-72	1	218	8	226				0.75	
SD-72	2	250	3	253				0.86	
SD-72	3	277	3	280				0.96	
SD-72	4	284	3	287				0.98	
SD-72	5	284	4	288	262.6	28.6		0.98	0.91

### Sediment Larval Test Summary

<b>CLIENT</b> Pioneer	<b>PROJECT</b> Olympia Site	<b>PROJECT NUMBER</b> PG1661
<b>PROJECT MANAGER</b> M. Knowlen	<b>TEST TYPE</b> Sediment Larval	<b>SPECIES</b> <i>Mytilus galloprovincialis</i>

#### LARVAL ENDPOINT DATA

Sample ID	Rep	Normal	Abnormal	Total	Mean # Normal	SD	Average Control Normal Survival (Nc/I)	# Normal Relative to Control 1	Average # Normal Relative to Control 1
SD-73	1	252	5	257				0.87	
SD-73	2	251	5	256				0.87	
SD-73	3	233	2	235				0.80	
SD-73	4	230	14	244				0.79	
SD-73	5	214	16	230				236.0	
SD-74	1	237	6	243				0.82	
SD-74	2	111	3	114				0.38	
SD-74	3	238	8	246				0.82	
SD-74	4	263	1	264				0.91	
SD-74	5	227	13	240				215.2	
SD-75	1	238	23	261				0.82	
SD-75	2	257	10	267				0.89	
SD-75	3	220	18	238				0.76	
SD-75	4	239	4	243				0.82	
SD-75	5	238	2	240				238.4	

### Sediment Larval Test Day 0 Ammonia

CLIENT			PROJECT			PROJECT NUMBER			SPECIES										
Pioneer			Olympia Site			PG1661			Mytilus galloprovincialis										
Calibration Standards Temperature: 20.4			Date: 12/7/2022			Tech: NL/LG													
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																			
Sample	Day	Overlying/ Porewater	Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	measured			Laureate			Test salinity (ppt)	Test temp (C)	Temp (K)	pKa <sup>s</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa*	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes
						Total Dissolved Sulfide (µg/L as S)	Sulfide Sample Volume (ml)	Sulfide Multiplier	Total Dissolved Sulfide (µg/L as S)	Calculated	Sourced								
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record
Control	0	Overlying	0.00	19.8	T17/10	0	10	1	0	28	7.8	16.7	289.85	9.26	0.000	6.65	0.000		
CARR-REF-1	0	Overlying	0.00	19.7	T17/10	9	10	1	9	28	7.8	16.8	289.95	9.26	0.000	6.65	0.815		
CARR-REF-7	0	Overlying	0.00	19.7	T17/10	5	10	1	5	28	7.8	17.2	290.35	9.26	0.000	6.64	0.447		
SD-70	0	Overlying	0.00	20.6	T17/10	ND	10	1	ND	28	7.9	16.3	289.45	9.26	0.000	6.66	ND		
SD-71	0	Overlying	0.00	20.2	T17/10	ND	10	1	ND	28	7.9	16.4	289.55	9.26	0.000	6.65	ND		
SD-72	0	Overlying	0.00	19.9	T17/10	ND	10	1	ND	28	7.9	16.3	289.45	9.26	0.000	6.66	ND		
SD-73	0	Overlying	0.00	20.4	T17/10	ND	10	1	ND	28	7.8	16.6	289.75	9.26	0.000	6.65	ND		
SD-74	0	Overlying	0.00	20.5	T17/10	ND	10	1	ND	28	7.9	16.5	289.65	9.26	0.000	6.65	ND		
SD-75	0	Overlying	0.00	20.3	T17/10	ND	10	1	ND	28	7.9	16.8	289.95	9.26	0.000	6.65	ND		

### Sediment Larval Test Day 2 Ammonia

CLIENT		PROJECT			PROJECT NUMBER			SPECIES											
Pioneer		Olympia Site			PG1661			Mytilus galloprovincialis											
Calibration Standards Temperature: 20.1		Date: 12/9/2022		Tech: BH															
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																			
Sample	Day	Overlying/ Porewater	measured			Sulfide			Calculated			Test salinity (ppt)	Test temp (C)	Temp (K)	pKa <sup>s</sup>	Unionized NH <sub>3</sub> (mg/L)	H <sub>2</sub> S pKa <sup>*</sup>	Undissociated Sulfide (µg/L as H <sub>2</sub> S)	Notes
			Total NH <sub>3</sub> (mg/L)	NH <sub>3</sub> sample temp	WQ/Temp Meter	Total Dissolved Sulfide (µg/L as S)	Sample Volume (ml)	Sulfide Multiplier	Total Dissolved Sulfide (µg/L as S)	Calculated	Sourced								
Sourced	Sourced		Record	Record	Record	Record	Record	Record	Record	Record	Record	Sourced	Sourced	Sourced	Calculated	Calculated	Calculated	Calculated	
Control	2	Overlying	0.00	19.3	T17	2	10	1	2	28	8.0	16.5	289.65	9.26	0.000	6.65	0.120		
CARR-REF-1	2	Overlying	0.00	19.3	T17	4	10	1	4	28	7.8	16.6	289.75	9.26	0.000	6.65	0.365		
CARR-REF-7	2	Overlying	0.00	19.1	T17	2	10	1	2	28	7.8	16.9	290.05	9.26	0.000	6.65	0.181		
SD-70	2	Overlying	0.00	19.3	T17	ND	10	1	ND	28	7.9	16.7	289.85	9.26	0.000	6.65	ND		
SD-71	2	Overlying	0.00	19.2	T17	2	10	1	2	28	7.9	16.6	289.75	9.26	0.000	6.65	0.148		
SD-72	2	Overlying	0.00	19.8	T17	3	10	1	3	28	8.0	16.4	289.55	9.26	0.000	6.65	0.180		
SD-73	2	Overlying	0.00	19.1	T17	ND	10	1	ND	28	8.0	16.5	289.65	9.26	0.000	6.65	ND		
SD-74	2	Overlying	0.00	19.2	T17	2	10	1	2	28	8.0	16.4	289.55	9.26	0.000	6.65	0.120		
SD-75	2	Overlying	0.00	19.3	T17	ND	10	1	ND	28	7.9	16.5	289.65	9.26	0.000	6.65	ND		



## 3.2 *Mytilus galloprovincialis* Statistical Results



Bio STAT

File Edit Log Options Help

Project Information  
Project Name: Olympia Site: Larval Normality

Test Data (x1)  
Sample ID: SD-70  
Alias:

Rep	Data	Transform
1	270	270.0
2	278	278.0
3	273	273.0
4	269	269.0
5	265	265.0

Reference Data (x2)  
Reference ID: CARR-REF-7  
Alias:

Rep	Data	Transform
1	284	284.0
2	238	238.0
3	233	233.0
4	369	369.0
5	248	248.0

Statistics Status

Data is neither normal nor homoscedastic, Rankit transformation will be performed.

OK

Transformation Method: No Transformation

Experimental Alpha Level: 0.1

Execute Statistics

Experimental Hypothesis: Null:  $x1 \geq x2$   
Alternate:  $x1 < x2$

Messages

\*\*\* Executing Stats ...  
Conducting Shapiro-Wilk Normality Test...  
Conducting Levene's Homoscedasticity Test

Statistical Results

Test Treatment		Reference Treatment	
Number of Reps:	5	Number of Reps:	5
Test Mean:	271.0	Reference Mean:	274.4
Test SD:	4.848	Reference SD:	56.518
Transform Mean:	271.0	Transform Mean:	274.4
Transform SD:	4.848	Transform SD:	56.518

Normality (Shapiro-Wilk)		Homoscedasticity (Levene's)	
Critical W Value:	$\leq 0.842$	Critical Student's t:	$\geq 1.860$
Calculated W Value:	0.7982	Calculated Student's t:	2.6531
Alpha:	0.05	Alpha:	0.1
Normal:	X	Homoscedastic:	X

Test of Experimental Hypothesis

Statistic: Calculated Statistic:

Critical Value: Transform Type: No Transformation

Alpha Level: df: Accept Null Hypothesis: ?

Power:

BioStat input and error message for sample SD-70 for larval normality













### 3.3 *Mytilus galloprovincialis* Reference Toxicant Test Results

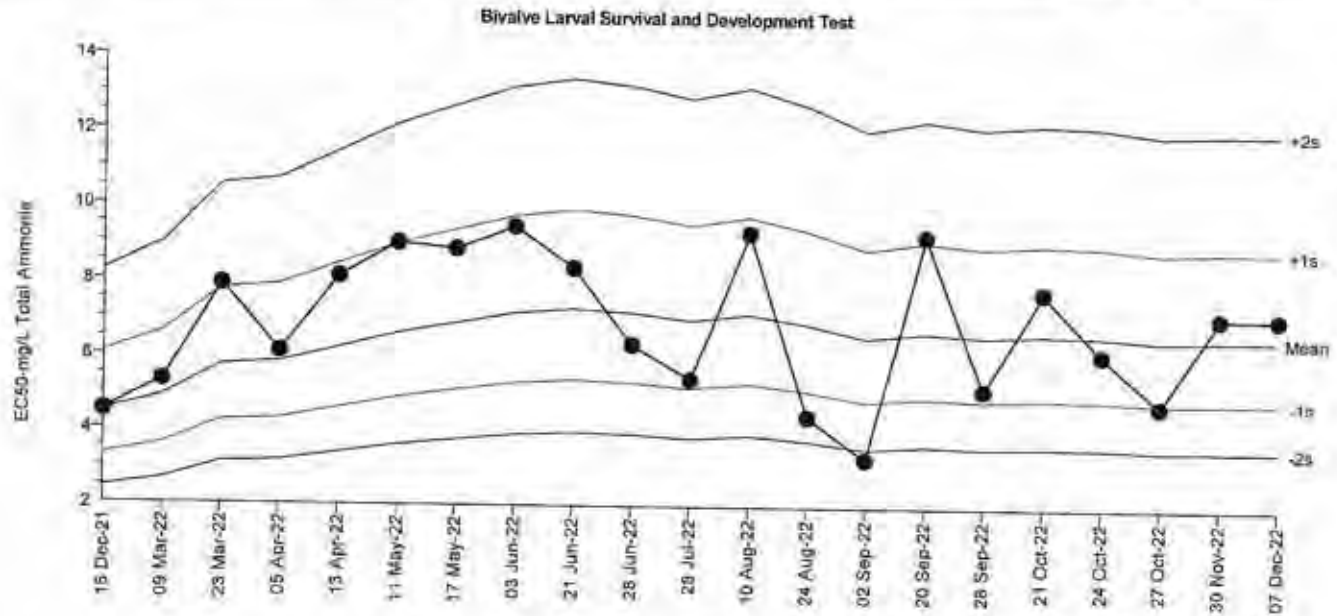
Bivalve Larval Survival and Development Test

All Matching Labs

Test Type: Development-Survival  
Protocol: All Protocols

Organism: Mytilus galloprovincialis (Bay Mussel)  
Endpoint: Combined Proportion Normal

Material: Total Ammonia  
Source: Reference Toxicant-REF



Mean: 6.567      Count: 20      -1s Warning Limit: 4.846      -2s Action Limit: 3.577  
Sigma: n/a      CV: 31.10%      +1s Warning Limit: 8.896      +2s Action Limit: 12.05

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2021	Dec	16	16:03	4.49	-2.076	-1.251	(-)		15-4520-7006	05-4889-9092	EcoAnalysts
2	2022	Mar	9	14:25	5.328	-1.239	-0.6885			01-1792-3956	04-9322-6360	EcoAnalysts
3			23	15:30	7.908	1.342	0.6122			16-1854-3161	19-1061-5237	EcoAnalysts
4		Apr	5	15:09	6.132	-0.4342	-0.2253			02-8622-3008	11-6194-4432	EcoAnalysts
5			13	15:38	8.124	1.557	0.7007			13-3713-9182	10-9596-9770	EcoAnalysts
6		May	11	15:54	9.005	2.439	1.04	(+)		17-9316-7686	08-9621-8105	EcoAnalysts
7			17	16:11	8.853	2.287	0.9839			11-5935-3112	11-7802-4839	EcoAnalysts
8		Jun	3	16:12	9.446	2.879	1.197	(+)		08-5591-8618	16-7793-8354	EcoAnalysts
9			21	17:46	8.368	1.801	0.798			03-7983-1979	17-5961-0612	EcoAnalysts
10			28	16:05	6.362	-0.2046	-0.1042			08-5637-7603	04-5931-5430	EcoAnalysts
11		Jul	28	15:55	5.431	-1.135	-0.625			19-6544-8440	11-0281-7196	EcoAnalysts
12		Aug	10	16:57	9.323	2.756	1.154	(+)		20-5736-9281	08-2934-0504	EcoAnalysts
13			24	16:43	4.439	-2.128	-1.289	(-)		10-4871-9595	11-0042-4049	EcoAnalysts
14		Sep	2	14:54	3.311	-3.255	-2.254	(-)	(-)	16-0701-8534	00-0124-1152	EcoAnalysts
15			20	16:02	9.267	2.701	1.134	(+)		11-7896-9547	00-7476-6700	EcoAnalysts
16			28	16:31	6.182	-1.385	-0.7799			10-3818-0354	11-9896-8834	EcoAnalysts
17		Oct	21	14:16	7.804	1.238	0.5886			05-2022-4267	03-4308-3965	EcoAnalysts
18			24	15:17	6.15	-0.4168	-0.2159			01-4864-2336	19-5269-5566	EcoAnalysts
19			27	17:02	4.776	-1.791	-1.048	(-)		12-4527-0974	13-7457-7890	EcoAnalysts
20		Nov	30	14:32	7.166	0.5991	0.2875			11-2220-4195	10-4569-3704	EcoAnalysts
21		Dec	7	17:43	7.159	0.5922	0.2843			19-4874-8030	20-9525-0017	EcoAnalysts

Bivalve Larval Survival and Development Test

All Matching Labs

Test Type: Development-Survival

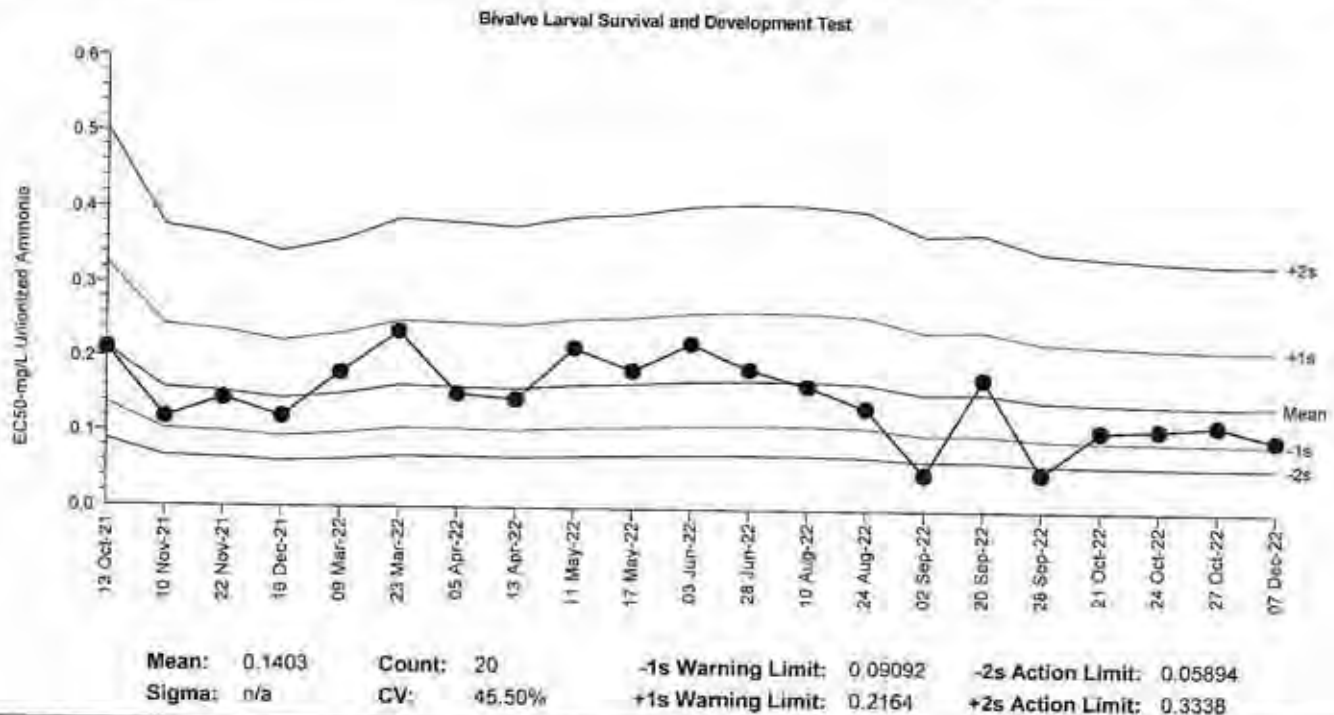
Organism: Mytilus galloprovincialis (Bay Mussel)

Material: Unionized Ammonia

Protocol: All Protocols

Endpoint: Combined Proportion Normal

Source: Reference Toxicant-REF



Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID	Laboratory
1	2021	Oct	13	15:27	0.2109	0.07063	0.9406			07-4633-6376	07-5149-9228	EcoAnalysts
2		Nov	10	13:32	0.1182	-0.02207	-0.3947			05-2210-5783	18-3737-2395	EcoAnalysts
3			22	15:40	0.144	0.003732	0.06057			11-7666-1725	06-3748-1355	EcoAnalysts
4		Dec	16	16:03	0.1203	-0.01996	-0.354			03-2193-3924	02-8390-4664	EcoAnalysts
5	2022	Mar	9	14:25	0.1799	0.0396	0.5736			18-7354-5358	09-3456-2941	EcoAnalysts
6			23	15:30	0.2359	0.09556	1.198	(+)		18-9877-4146	02-7793-3754	EcoAnalysts
7		Apr	5	15:09	0.1515	0.01117	0.1767			15-5824-5509	00-2065-3937	EcoAnalysts
8			13	15:38	0.1448	0.004497	0.07279			18-9475-6703	13-3543-8688	EcoAnalysts
9		May	11	15:54	0.2152	0.07491	0.9669			19-4844-7090	04-7446-5371	EcoAnalysts
10			17	16:11	0.185	0.04472	0.6382			21-0960-1917	00-4551-7197	EcoAnalysts
11		Jun	3	16:12	0.2219	0.08164	1.058	(+)		21-4199-4121	20-5427-8206	EcoAnalysts
12			28	16:05	0.188	0.04773	0.6755			19-3785-6817	00-8378-9623	EcoAnalysts
13		Aug	10	16:57	0.1651	0.02485	0.3761			09-3839-8015	12-5640-2017	EcoAnalysts
14			24	16:43	0.1359	-0.004428	-0.07399			00-7678-9875	07-1760-4646	EcoAnalysts
15		Sep	2	14:54	0.04851	-0.09179	-2.45	(-)	(-)	13-9573-6141	09-4475-1376	EcoAnalysts
16			20	16:02	0.1767	0.03644	0.5327			13-8303-2046	02-4939-5521	EcoAnalysts
17			28	16:31	0.04973	-0.09056	-2.392	(-)	(-)	14-4835-8902	06-7637-8760	EcoAnalysts
18		Oct	21	14:16	0.1071	-0.03321	-0.6231			20-9426-4253	15-1656-6246	EcoAnalysts
19			24	15:17	0.1096	-0.0307	-0.5698			18-7734-9147	06-4748-9707	EcoAnalysts
20			27	17:02	0.1156	-0.02471	-0.4469			01-3898-0369	19-9850-5740	EcoAnalysts
21		Dec	7	17:43	0.09634	-0.04396	-0.8672			15-6747-3203	15-5237-0673	EcoAnalysts

# CETIS Summary Report

Report Date: 11 Jan-23 12:47 (p 1 of 3)  
 Test Code/ID: P220819.13 / 19-4874-8030

## Bivalve Larval Survival and Development Test

EcoAnalysts

Batch ID: 01-9907-0502	Test Type: Development-Survival	Analyst:
Start Date: 07 Dec-22 17:43	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 09 Dec-22 16:27	Species: Mytilus galloprovincialis	Brine: Not Applicable
Test Length: 47h	Taxon: Bivalvia	Source: Taylor Shellfish
		Age:
Sample ID: 20-5012-0585	Code: P220819.13	Project: Reference Toxicant
Sample Date: 19 Aug-22	Material: Total Ammonia	Source: Reference Toxicant
Receipt Date: 19 Aug-22	CAS (PC):	Station: P220819.13
Sample Age: 110d 18h	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓	NOEL	LOEL	TOEL	TU	PMSD	S
16-1288-6928	Combined Proportion Normal	Dunnnett Multiple Comparison Test	✓	3.14	7.48	4.846		7.67%	1
01-4161-3220	Proportion Normal	Dunnnett Multiple Comparison Test	✓	3.14	7.48	4.846		2.38%	1
20-7713-9799	Proportion Survived	Fisher Exact Test		22.8	>22.8	n/a		n/a	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓	Level	mg/L	95% LCL	95% UCL	TU	S
20-9525-0017	Combined Proportion Normal	Spearman-Kärber	✓	EC50	7.159	6.967	7.356		1
16-6980-9386	Proportion Normal	Spearman-Kärber		EC50	7.287	7.088	7.493		1
00-7787-7584	Proportion Survived	Linear Interpolation (ICPIN)		EC5	>22.8	n/a	n/a		1
				EC10	>22.8	n/a	n/a		
				EC15	>22.8	n/a	n/a		
				EC20	>22.8	n/a	n/a		
				EC25	>22.8	n/a	n/a		
				EC40	>22.8	n/a	n/a		
				EC50	>22.8	n/a	n/a		

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits			Decision
				Lower	Upper	Overlap	
01-4161-3220	Proportion Normal	Control Resp	0.9817	0.9	>>	Yes	Passes Criteria
16-6980-9386	Proportion Normal	Control Resp	0.9817	0.9	>>	Yes	Passes Criteria
00-7787-7584	Proportion Survived	Control Resp	0.9841	0.5	>>	Yes	Passes Criteria
20-7713-9799	Proportion Survived	Control Resp	0.9841	0.5	>>	Yes	Passes Criteria
16-1288-6928	Combined Proportion Normal	PMSD	0.07671	<<	0.25	No	Passes Criteria

# CETIS Summary Report

Report Date: 11 Jan-23 12:47 (p 2 of 3)  
 Test Code/ID: P220819.13 / 19-4874-8030

## Bivalve Larval Survival and Development Test

EcoAnalysts

### Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9743	0.8862	1.0000	0.9338	1.0000	0.0205	0.0355	3.64%	0.00%
0.941		3	0.9645	0.8868	1.0000	0.9412	1.0000	0.0181	0.0313	3.24%	1.01%
3.14		3	0.9902	0.9480	1.0000	0.9706	1.0000	0.0098	0.0170	1.71%	-1.64%
7.48		3	0.4914	0.3543	0.6285	0.4375	0.5478	0.0319	0.0552	11.23%	49.56%
14.8		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
22.8		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

### Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9817	0.9716	0.9917	0.9782	0.9861	0.0023	0.0041	0.41%	0.00%
0.941		3	0.9804	0.9538	1.0000	0.9717	0.9923	0.0062	0.0107	1.09%	0.13%
3.14		3	0.9843	0.9623	1.0000	0.9751	0.9928	0.0051	0.0089	0.90%	-0.27%
7.48		3	0.5160	0.4141	0.6179	0.4704	0.5498	0.0237	0.0410	7.95%	47.44%
14.8		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
22.8		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

### Proportion Survived Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9841	0.9155	1.0000	0.9522	1.0000	0.0159	0.0276	2.80%	0.00%
0.941		3	0.9743	0.9187	1.0000	0.9596	1.0000	0.0129	0.0224	2.30%	1.00%
3.14		3	0.9951	0.9740	1.0000	0.9853	1.0000	0.0049	0.0085	0.85%	-1.12%
7.48		3	0.9510	0.8533	1.0000	0.9265	0.9963	0.0227	0.0393	4.13%	3.36%
14.8		3	0.9792	0.9241	1.0000	0.9559	1.0000	0.0128	0.0222	2.26%	0.50%
22.8		3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-1.62%

### Combined Proportion Normal Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	0.9890	0.9338
0.941		1.0000	0.9412	0.9522
3.14		1.0000	1.0000	0.9706
7.48		0.5478	0.4375	0.4890
14.8		0.0000	0.0000	0.0000
22.8		0.0000	0.0000	0.0000

### Proportion Normal Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	0.9861	0.9782	0.9807
0.941		0.9717	0.9771	0.9923
3.14		0.9751	0.9928	0.9851
7.48		0.5498	0.4704	0.5278
14.8		0.0000	0.0000	0.0000
22.8		0.0000	0.0000	0.0000

### Proportion Survived Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	1.0000	0.9522
0.941		1.0000	0.9632	0.9596
3.14		1.0000	1.0000	0.9853
7.48		0.9963	0.9301	0.9265
14.8		1.0000	0.9816	0.9559
22.8		1.0000	1.0000	1.0000

# CETIS Summary Report

Report Date: 11 Jan-23 12:47 (p 3 of 3)  
Test Code/ID: P220819.13 / 19-4874-8030

## Bivalve Larval Survival and Development Test

EcoAnalysts

### Combined Proportion Normal Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	284/284	269/272	254/272
0.941		275/275	256/272	259/272
3.14		274/274	274/274	264/272
7.48		149/272	119/272	133/272
14.8		0/272	0/272	0/272
22.8		0/272	0/272	0/272

### Proportion Normal Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	284/288	269/275	254/259
0.941		275/283	256/262	259/261
3.14		274/281	274/276	264/268
7.48		149/271	119/253	133/252
14.8		0/277	0/267	0/260
22.8		0/273	0/273	0/277

### Proportion Survived Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	272/272	272/272	259/272
0.941		272/272	262/272	261/272
3.14		272/272	272/272	268/272
7.48		271/272	253/272	252/272
14.8		272/272	267/272	260/272
22.8		272/272	272/272	272/272



**CETIS Test Data Worksheet**

Report Date: 11 Jan-23 12:45 (p 1 of 1)  
 Test Code/ID: P220819.13 / 19-4874-8030

**Bivalve Larval Survival and Development Test**

EcoAnalysts

Start Date: 07 Dec-22 17:43 Species: Mytilus galloprovincialis Sample Code: P220819.13  
 End Date: 09 Dec-22 16:27 Protocol: EPA/600/R-95/136 (1995) Sample Source: Reference Toxicant  
 Sample Date: 19 Aug-22 Material: Total Ammonia Sample Station: P220819.13

Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	D	1	6	272	288	288	284	
0	D	2	11	272	275	275	269	
0	D	3	5	272	259	259	254	
0.941		1	2	272	283	283	275	
0.941		2	8	272	262	262	256	
0.941		3	17	272	261	261	259	
3.14		1	12	272	281	281	274	
3.14		2	1	272	276	276	274	
3.14		3	14	272	268	268	264	
7.48		1	7	272	271	271	149	
7.48		2	9	272	253	253	119	
7.48		3	18	272	252	252	133	
14.8		1	15	272	277	277	0	
14.8		2	4	272	267	267	0	
14.8		3	13	272	260	260	0	
22.8		1	3	272	273	273	0	
22.8		2	16	272	273	273	0	
22.8		3	10	272	277	277	0	

# CETIS Summary Report

Report Date: 11 Jan-23 12:50 (p 1 of 3)

Test Code/ID: P220819.13UIA / 15-6747-3203

## Bivalve Larval Survival and Development Test

EcoAnalysts

Batch ID: 01-9907-0502	Test Type: Development-Survival	Analyst:
Start Date: 07 Dec-22 17:43	Protocol: EPA/600/R-95/136 (1995)	Diluent: Laboratory Seawater
Ending Date: 09 Dec-22 16:27	Species: Mytilus galloprovincialis	Brine: Not Applicable
Test Length: 47h	Taxon: Bivalvia	Source: Taylor Shellfish
		Age:
Sample ID: 05-4186-8072	Code: P220819.13UIA	Project: Reference Toxicant
Sample Date: 19 Aug-22	Material: Unionized Ammonia	Source: Reference Toxicant
Receipt Date: 19 Aug-22	CAS (PC):	Station: P220819.13UIA
Sample Age: 110d 18h	Client: Internal Lab	

## Multiple Comparison Summary

Analysis ID	Endpoint	Comparison Method	✓ NOEL	LOEL	TOEL	TU	PMSD	S
01-6352-5440	Combined Proportion Normal	Dunnett Multiple Comparison Test	✓ 0.042	0.101	0.06513		7.67%	1
21-0290-0141	Proportion Normal	Dunnett Multiple Comparison Test	✓ 0.042	0.101	0.06513		2.38%	1
00-1313-4778	Proportion Survived	Fisher Exact Test	0.307	>0.307	n/a		n/a	1

## Point Estimate Summary

Analysis ID	Endpoint	Point Estimate Method	✓ Level	mg/L	95% LCL	95% UCL	TU	S
15-5237-0673	Combined Proportion Normal	Spearman-Kärber	✓ EC50	0.09634	0.09375	0.09899		1
17-2848-0422	Proportion Normal	Spearman-Kärber	EC50	0.09807	0.09537	0.1008		1
04-2924-7316	Proportion Survived	Linear Interpolation (ICPIN)	EC5	>0.307	n/a	n/a		1
			EC10	>0.307	n/a	n/a		
			EC15	>0.307	n/a	n/a		
			EC20	>0.307	n/a	n/a		
			EC25	>0.307	n/a	n/a		
			EC40	>0.307	n/a	n/a		
			EC50	>0.307	n/a	n/a		

## Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits		Overlap	Decision
				Lower	Upper		
17-2848-0422	Proportion Normal	Control Resp	0.9817	0.9	>>	Yes	Passes Criteria
21-0290-0141	Proportion Normal	Control Resp	0.9817	0.9	>>	Yes	Passes Criteria
00-1313-4778	Proportion Survived	Control Resp	0.9841	0.5	>>	Yes	Passes Criteria
04-2924-7316	Proportion Survived	Control Resp	0.9841	0.5	>>	Yes	Passes Criteria
01-6352-5440	Combined Proportion Normal	PMSD	0.07671	<<	0.25	No	Passes Criteria

# CETIS Summary Report

Report Date: 11 Jan-23 12:50 (p 2 of 3)  
 Test Code/ID: P220819.13UIA / 15-6747-3203

## Bivalve Larval Survival and Development Test

EcoAnalysts

### Combined Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9743	0.8862	1.0000	0.9338	1.0000	0.0205	0.0355	3.64%	0.00%
0.013		3	0.9645	0.8868	1.0000	0.8412	1.0000	0.0181	0.0313	3.24%	1.01%
0.042		3	0.9902	0.9480	1.0000	0.9706	1.0000	0.0098	0.0170	1.71%	-1.64%
0.101		3	0.4914	0.3543	0.6285	0.4375	0.5478	0.0319	0.0552	11.23%	49.56%
0.199		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
0.307		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

### Proportion Normal Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9817	0.9716	0.9917	0.9782	0.9861	0.0023	0.0041	0.41%	0.00%
0.013		3	0.9804	0.9538	1.0000	0.9717	0.9923	0.0062	0.0107	1.09%	0.13%
0.042		3	0.9843	0.9623	1.0000	0.9751	0.9928	0.0051	0.0089	0.90%	-0.27%
0.101		3	0.5160	0.4141	0.6179	0.4704	0.5498	0.0237	0.0410	7.95%	47.44%
0.199		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%
0.307		3	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		100.00%

### Proportion Survived Summary

Conc-mg/L	Code	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	D	3	0.9841	0.9155	1.0000	0.9522	1.0000	0.0159	0.0276	2.80%	0.00%
0.013		3	0.9743	0.9187	1.0000	0.9596	1.0000	0.0129	0.0224	2.30%	1.00%
0.042		3	0.9951	0.9740	1.0000	0.9853	1.0000	0.0049	0.0085	0.85%	-1.12%
0.101		3	0.9510	0.8533	1.0000	0.9265	0.9963	0.0227	0.0393	4.13%	3.36%
0.199		3	0.9792	0.9241	1.0000	0.9559	1.0000	0.0128	0.0222	2.26%	0.50%
0.307		3	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	0.00%	-1.62%

### Combined Proportion Normal Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	0.9890	0.9338
0.013		1.0000	0.9412	0.9522
0.042		1.0000	1.0000	0.9706
0.101		0.5478	0.4375	0.4890
0.199		0.0000	0.0000	0.0000
0.307		0.0000	0.0000	0.0000

### Proportion Normal Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	0.9861	0.9782	0.9807
0.013		0.9717	0.9771	0.9923
0.042		0.9751	0.9928	0.9851
0.101		0.5498	0.4704	0.5278
0.199		0.0000	0.0000	0.0000
0.307		0.0000	0.0000	0.0000

### Proportion Survived Detail

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	1.0000	1.0000	0.9522
0.013		1.0000	0.9632	0.9596
0.042		1.0000	1.0000	0.9853
0.101		0.9963	0.9301	0.9265
0.199		1.0000	0.9816	0.9559
0.307		1.0000	1.0000	1.0000

# CETIS Summary Report

Report Date: 11 Jan-23 12:50 (p 3 of 3)  
 Test Code/ID: P220819.13UIA / 15-6747-3203

## Bivalve Larval Survival and Development Test

EcoAnalysts

### Combined Proportion Normal Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	284/284	269/272	254/272
0.013		275/275	256/272	259/272
0.042		274/274	274/274	264/272
0.101		149/272	119/272	133/272
0.199		0/272	0/272	0/272
0.307		0/272	0/272	0/272

### Proportion Normal Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	284/288	269/275	254/259
0.013		275/283	256/262	259/261
0.042		274/281	274/276	264/268
0.101		149/271	119/253	133/252
0.199		0/277	0/267	0/260
0.307		0/273	0/273	0/277

### Proportion Survived Binomials

Conc-mg/L	Code	Rep 1	Rep 2	Rep 3
0	D	272/272	272/272	259/272
0.013		272/272	262/272	261/272
0.042		272/272	272/272	268/272
0.101		271/272	253/272	252/272
0.199		272/272	267/272	260/272
0.307		272/272	272/272	272/272

**CETIS Test Data Worksheet**

Report Date: 11 Jan-23 12:53 (p 1 of 1)  
 Test Code/ID: P220819.13UIA / 15-6747-3203

**Bivalve Larval Survival and Development Test** EcoAnalysts

Start Date: 07 Dec-22 17:43    Species: Mytilus galloprovincialis    Sample Code: P220819.13UIA  
 End Date: 09 Dec-22 16:27    Protocol: EPA/600/R-95/136 (1995)    Sample Source: Reference Toxicant  
 Sample Date: 19 Aug-22    Material: Unionized Ammonia    Sample Station: P220819.13UIA

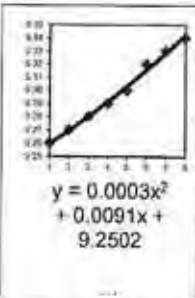
Conc-mg/L	Code	Rep	Pos	Initial Density	Final Density	# Counted	# Normal	Notes
0	D	1	6	272	288	288	284	
0	D	2	15	272	275	275	269	
0	D	3	13	272	259	259	254	
0.013		1	4	272	283	283	275	
0.013		2	7	272	262	262	256	
0.013		3	5	272	261	261	259	
0.042		1	10	272	281	281	274	
0.042		2	1	272	276	276	274	
0.042		3	18	272	268	268	264	
0.101		1	9	272	271	271	149	
0.101		2	8	272	253	253	119	
0.101		3	12	272	252	252	133	
0.199		1	3	272	277	277	0	
0.199		2	14	272	267	267	0	
0.199		3	16	272	260	260	0	
0.307		1	11	272	273	273	0	
0.307		2	17	272	273	273	0	
0.307		3	2	272	277	277	0	

# Un-ionized Ammonia Calculator

CLIENT:	Pioneer	Date of Test:	December 7, 2022
PROJECT:	Olympia Site	Test Type:	<i>Mytilus galloprovincialis</i>
COMMENTS:	P220819.13		

To convert Total Ammonia (mg/L) to Free (un-ionized) Ammonia (mg/L) enter the corresponding total ammonia, salinity, temperature, and pH.

Ionic strength:pKa*	
1	9.26
2	9.27
3	9.28
4	9.29
5	9.30
6	9.32
7	9.33
8	9.34



Sample	Mod	NH3T (mg/L)	salinity (ppt)	pH	temp (C)	temp (K)	pKa*		NH3U (mg/L)
							Actual	Calculated	
Target / Sample Name		Actual	Actual	Actual	Actual	Calculated	Calculated	Calculated	
Example 3.5		2.000	10.0	7.5	5.0	278.15	9.2520	0.008	
1									
2									
3	1.5	0.941	28	7.7	15.3	288.45	9.2555	0.013	
4	3	3.14	28	7.7	15.3	288.45	9.2555	0.042	
5	6	7.48	28	7.7	15.3	288.45	9.2555	0.101	
6	12	14.8	28	7.7	15.3	288.45	9.2555	0.199	
7	18	22.8	28	7.7	15.3	288.45	9.2555	0.307	
8									
9									
10									
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45									

*QAW*  
*MANS*



### 48 Hour Bivalve Development Reference Toxicant Test

Test ID: <b>P220819.13</b>	Replicates: 3	Study Director: <b>J. Levensood</b>	Location: <b>Inc #1</b>
Dilution Water Batch: <b>FSN120122.01</b>	Organism Batch: <b>TS120622.01 &amp; TS092022</b>	Associated Test(s): <b>Pioneer Tech Corp.</b>	Organism: <b>M.sp.</b>
Chamber Size/Type: <b>30 ml shell vial</b>	Exposure Volume: <b>10 ml</b>		
Toxicant: Ammonium Chloride:	Lot #: <b>22E3150086</b>	Date Prepared: <b>12/7/22</b>	Initials: <b>DM</b>
Target Concentrations: <b>See spiking worksheet</b>	Quantity of Stock: Target: <b>See spiking worksheet</b>	Quantity of Diluent: Target: <b>200 mL</b>	
<b>See spiking worksheet</b>	Actual: <b>See spiking worksheet</b>	Actual: <b>200 mL</b>	

#### SPAWNING DATA

Initial Spawning Time: <b>7:00</b>	Final Spawning Time: <b>14:57</b>	Fertilization Time: <b>14:57</b>	No. of Females: <b>6</b>	No. of Males: <b>2</b>
Embryo Density (count/mL):	1. <b>162</b>	2. <b>174</b>	3. <b>✓</b>	Mean: <b>168</b>
Stocking Volume Calculation: $2700 / 16.800 = 0.16 \times 40 \text{ mL} = 6.43 \text{ mL}$ <sup>50</sup> <del>900</del> $40 \text{ mL} - 6.43 = 33.57 \text{ mL FBW}$				
<b>0 Hours</b>	Date: <b>12/7/22</b> WQ Time: <b>15:06 DM</b>	Start Time: <b>17:43</b>	Initials: <b>NL/DM</b>	

#### STOCK

	Control	1.5	3	6	12	18
D.O. (%) (>4.8 mg/L)	<b>8.2</b>	<b>8.3</b>	<b>8.4</b>	<b>8.4</b>	<b>8.5</b>	<b>8.4</b>
Temperature (16 ± 1°C)	<b>15.3</b>	<b>15.3</b>	<b>15.3</b>	<b>15.3</b>	<b>15.3</b>	<b>15.3</b>
Salinity (28 ± 1 ppt)	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>28</b>
pH (7.5-9)	<b>7.7</b>	<b>7.7</b>	<b>7.7</b>	<b>7.7</b>	<b>7.7</b>	<b>7.7</b>

<b>Day 1</b>	Temperature (16 ± 1°C)	<b>15.4</b>	<b>TL6</b>	<b>NL</b>
<b>Final Day</b>	Date: <b>12/9</b>	WQ Time: <b>16:22</b>	End Time: <b>16:27</b>	Initials: <b>NL</b>
	Formalin Lot #: <b>220304-50</b>	Rose Bengal Lot #: <b>5135</b>		

#### STOCK

	Control	1.5	3	6	12	18
D.O. (%) (>4.8 mg/L)	<b>7.8</b>	<b>7.9</b>	<b>8.0</b>	<b>7.9</b>	<b>7.8</b>	<b>7.9</b>
Temperature (16 ± 1°C) ①	<b>15.8</b>	<b>15.8</b>	<b>15.8</b>	<b>15.8</b>	<b>15.8</b>	<b>15.8</b>
Salinity (28 ± 1 ppt)	<b>30</b> ③	<b>29</b>	<b>28</b>	<b>28</b>	<b>28</b>	<b>29</b>
pH (7.5-9)	<b>7.9</b>	<b>8.0</b>	<b>8.0</b>	<b>8.0</b>	<b>7.9</b>	<b>8.0</b>

- ① Used Inc #1 temp blank - DM-12/7/22, NL 12/8, NL 12/9
- ② MR-DM-12/7/22
- ③ Possible evaporation of swr. - NL 12/9



## 48 Hour Bivalve Development Reference Toxicant Test

P220819.13

Conc.	Rep	Number Normal	Number Abnormal	Date	Initials
Control	1	284	4	12/20/22	MK
	2	269	6	12/20/22	MK
	3	254	5	12/20/22	MK
1.5	1	275	8	12/20/22	MK
	2	286	6	12/20/22	MK
	3	259	2	12/20/22	MK
3	1	274	7	12/20/22	MK
	2	274	2	12/20/22	MK
	3	264	4	12/20/22	MK
6	1	149	122	12/20/22	MK
	2	119	134	12/20/22	MK
	3	133	119	12/20/22	MK
12	1	0	277	12/20/22	MK
	2	0	267	12/20/22	MK
	3	0	260	12/20/22	MK
18	1	0	273	12/20/22	MK
	2	0	273	12/20/22	MK
	3	0	277	12/20/22	MK

### Stocking Density

Rep	Count	Init.
1	263	MK
2	307	MK
3	247	MK
<b>Mean:</b>	<b>272</b>	<b>MK</b>

QA Count Checks:			
#1 conc/rep <u>01</u>	#2 conc/rep <u>32</u>	#3 conc/rep <u>31</u>	#4 conc/rep _____
# normal <u>282</u>	# normal <u>271</u>	# normal <u>265</u>	# normal _____
# abnormal <u>4</u>	# abnormal <u>2</u>	# abnormal <u>4</u>	# abnormal _____
Tech. Init. <u>DML</u>	Tech. Init. <u>DML</u>	Tech. Init. <u>DML</u>	Tech. Init. _____
Calc. orig: $282/286 = 98.6\%$ QA: $282/286 = 98.6\%$	orig: $271/276 = 98.2\%$ QA: $271/273 = 99.3\%$	orig: $265/281 = 94.3\%$ QA: $265/269 = 98.5\%$	/
$\% \Delta = 0.1\%$	$\% \Delta = 0\%$	$\% \Delta = 1.0\%$	
QA Check Acceptability: <input checked="" type="checkbox"/> <5% difference in means of QA & orig. counts			

**Ammonia Reference Toxicant  
Spiking Worksheet**

Reference Toxicant ID: P220819.13  
 Date Prepared: 12/7/22  
 Technician Initials: DM

## Biv / Echino NH<sub>3</sub> RT

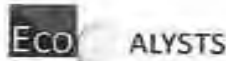
Assumptions in Model  
 Stock ammonia concentration is 9,000 mg/L = 9 mg/mL

Date: 11/22/2022  
 Measurement: 9343.33333

Test Solutions			Volume of stock to reach desired concentration	
Measured Concentration	Desired Concentration	Volume	mL stock to increase	
mg/L	mg/L	mL		
0.00	0	200		SALT WATER
0.941	1.5	200		0.048
3.14	3	200		0.096
4.28	6	200		0.193
14.8	12	200		0.385
22.8	18	200		0.578

**APPENDIX B. CHAIN-OF-CUSTODY FORMS, LOGS, AND PRE-TEST DOCUMENTS**

# CHAIN OF CUSTODY



EFF IN WATER

PIONEER Tech Corp

EcoAnalysts, Inc.  
4770 NE View Dr., Portland, WA. 98364  
Tel: (360) 297-6040

Destination:	Sample Originator (Organization): <b>PIONEER Tech Corp</b>	Report Results To: <b>Hannah Morse</b>	Phone: <b>360 570 1700</b>
Destination Contact:	PERSON WHO COLLECTED SAMPLE: <b>HM</b>	Contact Name:	Fax:
Date:	Address: <b>6205 Corporate Ct Ct E Ste A Olympia WA 98502</b>	Lap Address:	Email: <b>morseh@uspioneer.com</b>
Turn-Around-Time: <b>Standard</b>	Phone: <b>360-570 1700</b>	Invoicing To:	
Project Name: <b>Solid Wood, Inc.</b>	Fax:	Comments or Special Instructions:	
Contract/PO:	E-mail:		

No.	Sample ID	Matrix	Volume & Type of Container	Date & Time	10 DAY AMPHIPOD SOLID PHASE	SED. LARVAL DEVELOP.	30 DAY POLYCHAETA GROWTH	Analyses:	Preservation	Sample Temp Upon Receipt	LAB ID
1	WB-SO-SD70-0005	SSS	~6L	11/30 0830	X	X	X		Ice-water	0.3°C	P221201.03
2	WB-SO-SD71-0005	↓	↓	11/30 0905	X	X	X		Ice-water	0.3°C	P221201.04
3	WB-SO-SD72-0005	↓	↓	11/30 1025	X	X	X		Ice-water	0.7°C	P221201.05
4	WB-SO-SD73-0005	↓	↓	11/30 0935	X	X	X		Ice-water	0.7°C	P221201.06
5	WB-SO-SD74-0005	↓	↓	11/30 1115	X	X	X		Ice-water	0.7°C	P221201.07
6	WB-SO-SD75-0005	↓	↓	11/30 1145	X	X	X		Ice-water	0.3°C	P221201.08
7											
8											
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17											
18											
19											
20											

Relinquished by:		Received by:		Relinquished by:		Received by:		Matrix Codes FW = Fresh Water SS = Salt & Silts SS = Soil & Sediment
Print Name: <b>Hannah Morse</b>	Print Name: <b>Shelle Mulligan</b>	Print Name:	Print Name:	Print Name:	Print Name:			
Signature: <i>[Signature]</i>	Signature: <i>[Signature]</i>	Signature:	Signature:	Signature:	Signature:			
Affiliation: <b>PTC</b>	Affiliation: <b>EcoAnalysts</b>	Affiliation:	Affiliation:	Affiliation:	Affiliation:			
Date/Time: <b>11/30 1315</b>	Date/Time: <b>12/1/22 1300</b>	Date/Time:	Date/Time:	Date/Time:	Date/Time:			

# CHAIN OF CUSTODY

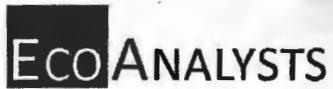


EcoAnalysts, Inc.  
4770 NE View Dr., Port Gamble, WA. 98364  
Tel: (360) 297-6040

Destination: <b>EcoAnalyst</b>	Sample Originator (Organization): <b>EcoAnalysts</b>	Report Results To:	Phone:
Destination Contact: <b>-</b>	PERSON WHO COLLECTED SAMPLE: <b>Brian Hester</b>	Contact Name:	Fax:
Date: <b>11.18.22</b>	Address:	Address:	Email:
Turn-Around-Time: <b>NA</b>	Phone:	Analyses:	Invoicing To:
Project Name: <b>Ref Sed Collection / Internals</b>	Fax:		
Contract/PO:	E-mail:		

No.	Sample ID	Secondary ID: Replicate, X of Y, etc.	Matrix	Volume/Mass	Date	Time	As needed general						Preservation	Sample Temp Upon Receipt	LAB ID
1	CARR-REF-1		Sed	~1BL	11.18.22	1246	X								
2	CARR-REF-2		sed	~1BL	11.18.22	1401	X								
3	CARR-REF-3A		Sed	~1BL	11.18.22	1055	X								
4	CARR-REF-3B		Sed	~10L	11.18.22	1055	X								
5	CARR-REF-4		Sed	~5L	11.18.22	1309	X								
6	CARR-REF-5		Sed	~1BL	11.18.22	1345	X								
7	<del>CARR-REF-6</del>		<del>Sed</del>	<del>~1BL</del>	<del>11.18.22</del>	<del>---</del>									
8	CARR-REF-7		Sed	~1BL	11.18.22	1200	X								
9															
10															
11															
12															
13															
14															
15															
16															
17															
18															
19															
20															

Relinquished by:		Received by:		Relinquished by:		Received by:		Matrix Codes FW = Fresh Water SB = Salt & Brackish Water SS = Soil & Sediment TS = Tissue
Print Name: <b>Brian Hester</b>	Signature:	Print Name: <b>Brian Hester</b>	Signature:	Print Name:	Signature:	Print Name:	Signature:	
Affiliation: <b>EcoAnalysts</b>	Date/Time: <b>11.19.22 0845</b>	Affiliation: <b>EcoAnalysts</b>	Date/Time: <b>11.19.22 0845</b>	Affiliation:	Date/Time:	Affiliation:	Date/Time:	
① IE 11.19.22								



STATION COORDINATE LOG  
For Van Veen

Project: Ref Sediment Collection

Recorder: Nicole Lundgren

DATE	TIME	STATION	DROP NO.	LATITUDE	LONGITUDE	DEPTH (ft)	RECOVERY DEPTH (cm)	Tidal Height	COMMENTS
11/18	1055	NOT Recorded	-	N47.34385	W122.69447	154	NOT Recorded		deep fine grain site. not measured
11/18		↓							
11/18	1200	CR22	1	N47.33192	W122.67063	6.3	2-4cm		12% fines / 14% fines
11/18	1246	CR R1-53a	3	N47.33770	W122.66438	59.5	8cm		48% fines
11/18	1309	CR R1-63	1	N47.33481	W122.66418	61.1	8cm		72% fines, repositioned
11/18	1345	CR R1-53b	2	N47.33452	W122.66417	62.4	8cm		76%
11/18	1401	CR R1-53c	2	N47.33391	W122.66411	58.4	6cm		68% fines mixed
11/18	1424	CR R1-53d	3	N47.33370	W122.66409	54.7	6cm		61% fines together
11/18									

acc  
ref  
5A  
5B  
V  
V  
V  
7  
1  
4  
5  
2  
2

① 15 drops

② 15 - 11/18

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### Wet-Sieve Procedure for Determining Percent Fines (<63 µm) of Sediment

DATE: 12/1/2022	CLIENT: Pioneer Tech Corp.	PROJECT: Solid Wood Inc.
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**Procedure:**

1. Collect 50 mL of sediment to be analyzed
2. Transfer sediment to a #230 (63 µm) testing sieve
3. Rinse sieve thoroughly with a stream of water until water flowing through the sieve is clear
4. Transfer all retained material to a 100mL graduated cylinder using a small funnel and DI squirt bottle
5. Allow sediment to settle. Record the volume of sediment retained below.

SAMPLE ID:	A) INITIAL VOLUME OF SEDIMENT (mL)	B) VOLUME OF SEDIMENT RETAINED (mL)	A - B =	Multiplier	Estimated Percent Fines
Example	50	22	28	x2 =	56
WB-SO-SD70-0005	50	41	9	x2 =	18
WB-SO-SD71-0005 (1)	50	39	11	x2 =	22
WB-SO-SD72-0005	50	27	23	x2 =	46
WB-SO-SD73-0005 (2)	50	35	15	x2 =	30
WB-SO-SD74-0005 (3)	50	19	31	x2 =	62
WB-SO-SD75-0005 (4)	50	31	19	x2 =	38
				x2 =	
WB-SO-SD74-0005 (Excluding organic matter)	50	15	35	x2 =	70
WB-SO-SD75-0005 (Excluding organic matter)	50	18	32	x2 =	64
1	WB-SO-SD71-0005	Shell hash, live clams, live polychaetes, live crab.			
2	WB-SO-SD73-0005	Shell hash			
3	WB-SO-SD74-0005	Fine organic matter; 4 mL of retained material was organic fluff			
4	WB-SO-SD75-0005	Large amount of fine organic matter, blocked sieve; 13 mL of retained material was organic			

T.2

CLIENT			PROJECT										SPECIES										
Pioneer Tech Corp.			Solid Wood Inc.																				
Calibration Standards Temperature: 19.4			Date: 12/2/2022			Tech: BH																	
NH <sub>3</sub> sample temperature should be within +/- 1°C of standard temp at time and date of analysis																							
Sample	Material	Overlying/ Porewater	Total NH <sub>3</sub>			NH <sub>3</sub> sample			Total Sulfide			Caicuatea Total Sulfide			Porewater salinity (ppt)	Projected test temp (C)	Temp (K)	Unionized NH <sub>3</sub>		Undissociated Sulfide		Undissociated Sulfide (mg/L as H <sub>2</sub> S)	Notes
			Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record	Record				Record	Record	Record	Record		
WB-SO-SD70-0005	Bulk	PW	1.48	19.2	T17	ND	10	1.0	ND	28.60	7.65	16.0	289.15	9.26	0.019	6.66	ND	ND					
WB-SO-SD71-0005	Bulk	PW	1.15	19.3	T17	3	10	1.0	3	28.80	7.67	16.0	289.15	9.26	0.015	6.66	0.364	0.000					
WB-SO-SD72-0005	Bulk	PW	1.44	18.8	T17	0	10	1.0	0	29.44	7.67	16.0	289.15	9.26	0.019	6.66	0.000	0.000					
WB-SO-SD73-0005	Bulk	PW	1.22	19.0	T17	16	10	1.0	16	28.69	7.59	16.0	289.15	9.26	0.013	6.66	2.278	0.002					
WB-SO-SD74-0005	Bulk	PW	1.24	19.0	T17	ND	10	1.0	ND	29.19	7.61	16.0	289.15	9.26	0.014	6.66	ND	ND					
WB-SO-SD75-0005	Bulk	PW	0.874	19.2	T17	26	10	1.0	26	28.71	7.62	16.0	289.15	9.26	0.010	6.66	3.488	0.003	pH 10 check read 7.38. values may be skewed low. BH 12/2/22				

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double-sided printing.

## ORGANISM RECEIPT LOG

Date: 12/7/22	Time: 1010	Batch No. NWA120722					
Organism: Eohaustorius estuarius							
Source / Supplier: Northwest Amphipod							
No. Ordered: 1515	No. Received: 1515 + 10%	Source Batch: Collection date, hatch date, etc.): Collected: 12/15/22					
Condition of Organisms: Good		Approximate Size or Age: (Days from hatch, life stage, size class, etc.): Size: 3-5 mm					
Shipper: FedEx		B of L (Tracking No.) 810564174320					
Condition of Container: Good		Received By: M. Seibert					
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	# Dead	% Dead*	Tech. (Initials)
1	0	7.1	0	7.0			MS
*If >10% contact lab manager							
Notes:  0 rec'd on moist sand							

**Northwest Amphipod, LLC**3101 SE Ferry Slip Rd #803, P.O. Box 542, Newport, OR 97365  
Tel: 541-867-7225, [nwamphipod@gmail.com](mailto:nwamphipod@gmail.com)**SUBJECT:** Animal Collection Data Sheet (shipping)**SOLD TO:**EcoAnalysts  
4770 NE View Dr.  
P.O. Box 216  
Port Gamble WA 98364Brian Hester/Collin Ray/Hillary Eicholer,  
Michelle Knowlen, Lauren Brandkamp, Julia Levengood  
360.297.6040  
Julia Levengood  
360.509.4141

FedEx# 1817-5747-7

P.O. # 2516

**DATE OF SHIPMENT:** 12-6-22**ANIMAL HISTORY**

Species	Age/Size	Number Shipped
<i>Eohaustorius estuaris</i>	3-5mm	1515 + 10%

**WATER QUALITY AT TIME OF SHIPMENT**

Temperature (°C): 11.4	pH: 8.0	Salinity (ppt): 300	D.O. (mg/L): 8.8
Other:			

**PACKAGED BY:** GB**DATE:** 12-6-22**FIELD COLLECTION/CULTURE NOTES**Collected 12-05-22 from Yaquina Bay, OR  
Interstitial WQ: Temp 2.0°C, Salinity 29.0ppt; salinity adjusted ~5 ppt up or down as needed.

Held at ~15°C in aerated water.

**ADDITIONAL COMMENTS**

2-liters of 0.5 mm sieved home sediment included.

**PLEASE RETURN ALL SHIPPING MATERIALS**

If you have any questions, please call Yves Nakahama, Gary Buhler or Gerald Irissarri at (541) 867-7225.

Thank You.







Aquatic Toxicology Support  
1849 Charleston Beach Road West  
Bremerton, Washington 98312  
(360) 813-1202

Order Summary

Species: <i>Neanthes arenaceodentata</i> *	Emerge Date: 28 Nov'22
Number Ordered: 540	Number Shipped: 540
Date Shipped: 14 Dec '22	Salinity (ppt): 30
pH: 8.0	Temperature (°C): 20.9

\*Smith 1964. CSU Long Beach strain. Feed upon arrival.

## ORGANISM RECEIPT LOG

Date: 12/6/22		Time: 1430		Batch No. TS120622.01			
Organism: Mytilis galloprovincialis							
Source / Supplier: Taylor Shellfish							
No. Ordered: 10 lbs		No. Received: 10 lbs		Source Batch: Collection date, hatch date, etc.): collection: 12/6/22 1030			
Condition of Organisms: good				Approximate Size or Age: (Days from hatch, life stage, size class, etc.): Mixed age adults			
Shipper: Courier				B of L (Tracking No.) Courier			
Condition of Container: NA				Received By: DM			
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	# Dead	% Dead*	Tech. (Initials)
①	①	①	①	⑨	—	—	DM
*if >10% contact lab manager							
Notes: ① Received direct - DM - 12/6/22							

# TAYLOR SHELLFISH FARMS

SE 130 LYNCH RD. SHELTON WA 98584  
PHONE #: (360) 426-6178  
WASHINGTON STATE CERT. # WA46SP

Harvest  
Hour

10 am

HARVEST DATE:

Harvest  
Minute

30

HARVEST  Totten  
AREA:

Harvest  
Date

HARVEST  
ITEM:

Mussels

Harvest  
Date

12/6/22

Dept ID

FARM CODE:

Harvest  
Minute

M127 Galleher

QUANTITY:

10

Dozens

Tubs

Pounds

Sacks

## ORGANISM RECEIPT LOG

Date: <u>9/20/22</u>		Time: <u>1000</u>		Batch No. <u>TS092022</u>			
Organism: <u>Mytilus gallo,</u>							
Source / Supplier: <u>Taylor Shellfish</u>							
No. Ordered: <u>5 lbs</u>		No. Received: <u>5 lbs</u>		Source Batch: <u>collected 9/19/22</u> <small>Collection date, hatch date, etc.:</small>			
Condition of Organisms: <u>Good</u>				Approximate Size or Age: <u>Adult</u> <small>(Days from hatch, life stage, size class, etc.):</small>			
Shipper: <u>Carrier</u>				B of L (Tracking No.): <u>NA</u>			
Condition of Container: <u>Good</u>				Received By: <u>JL</u>			
Container	D.O. (mg/L)	Temp. (°C)	Cond. or Sal. (Include Units)	pH (Units)	# Dead	% Dead*	Tech. (Initials)
*	—————→						JL
*if >10% contact lab manager							
Notes: <u>* received Dry.</u>							

# TAYLOR SHELLFISH FARMS

SE 130 LYNCH RD, SHELTON WA 98584  
PHONE #: (360) 426-6178  
WASHINGTON STATE CERT. # : WA46SP

Harvest  
Hour

9/14/22 12:05

HARVEST DATE:

Harvest  
Minute

HARVEST

Sale  
 Pick Up  
*Cotton*

West Harstine

AREA:

Refer  
Date

HARVEST

Manila Clams

Geoduck

Refer

ITEM:

Oysters

*Mussels*

Refer

Dept ID

FARM CODE:

Refer  
Minute

*M127*

*Gallegos Cove*

QUANTITY:

*10*

Dozens

Tubs

Pounds

Sacks

Use the same harvest data and area o

### MAINTENANCE LOG FOR CULTURES

ORGANISM: E.oh  
 LOCATION: Bath 6

Batch Number: NWA120722      Date Received: 12/7      Initial # of Organisms: 16666      10% mortality = 1666 <sup>①</sup>

Date	Feed AM/PM	Tub No.	D.O.	Temp (°C)	Cond/Sp	pH	H <sub>2</sub> O Change	Organisms appear healthy (Y/N)	# Mort	Cumulative # Mort*	Init.	Comments
12/17	-	6A 1	8.0	15.9	29	8.0	Y	Y	0	-	NL	
12/17	-	2	7.4	16.2	29	7.7	Y	Y	0	33	NL	
12/18	-	✓ 1	8.2	15.5	29	8.0	Y	Y	4	37	LG	
12/18	-	✓ 2	8.2	15.8	29	8.0	Y	Y	<del>4</del> 8	<del>37</del>	LG	
12/19	-	1	8.2	15.5	29	7.9	Y	Y	0	37	LG	
12/19	-	2	8.2	15.6	29	7.9	Y	Y	0	37	LG	
12/20	-	✓ 1	8.1	15.5	29	7.9	Y	Y	0	37	LG	
12/20	-	✓ 2	6.2	15.5	29	7.8	Y	Y	0	37	LG	Airlines buried in sand, adjusted. <sub>2 LG</sub>
<div style="border: 1px solid black; width: 80%; margin: auto; padding: 20px; transform: rotate(-15deg);"> <p style="font-size: 2em; font-family: cursive;">End of culture</p> </div>												

FT = Flow-through

\*For all containers and all days for a given batch; if >10% notify lab manager

## MAINTENANCE LOG FOR FLOW-THROUGH CULTURE TUBS

LOCATION: Bath 7

Organism (A): <u>M.sp</u>	Batch Number: <u>TS09<sup>20</sup>222.01</u>	Date Received: <u>9/22/22</u>	Initial # of Organisms: _____	10% Mort = _____
Organism (B):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =
Organism (C):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =
Organism (D):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =
Organism (E):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =

Date	Feed AM/PM		Organism (A, B, C, D, or E)	D.O.	Temp (°C)	Cond/ Sal	pH	H <sub>2</sub> O Change	Organisms appear healthy (Y/N)	# Mort	Cumulative # Mort*	Init.	Comments
11/7	-	✓	A	8.2	11.5	30	7.7	FT	Y	0	-	NL	
11/11	-	✓	A	7.8	11.7	32	7.7	FT	Y	0	-	DM	
11/14	-	✓	A	7.4	11.2	31	7.7	FT	Y	0	-	MS	
11/16	✓	-	A	8.5	11.2	31	7.7	FT	Y	0	-	NL	
11/18	✓	-	A	8.5	11.4	31	7.7	FT	Y	0	-	SZ	
11/21	-	✓	A	8.0	11.3	31	7.7	FT	Y	0	-	SZ	
11/23	✓	-	A	8.4	11.3	31	7.7	FT	Y	0	0	NL	
11/25	✓	-	A	8.5	11.7	31	7.9	FT	Y	0	0	NL	
11/28	-	✓	A	8.2	10.9	31	7.7	FT	Y	0	0	LG	
11/30	-	-	A	8.3	10.8	31	7.8	FT	Y	0	0	LG	
12/2	-	✓	A	8.1	10.7	30	7.8	FT	Y	0	0	DM	
12/5	-	✓	A	8.3	11.0	31	7.6	FT	Y	0	0	SZ	
12/7	-	✓	A	8.2	10.2	31	7.8	FT	Y	0	0	LG	
12/9	✓	-	A	7.2	13.8	31	7.7	FT	Y	0	0	BT	

FT = Flow-through

\*For all days of a given batch; if >10% notify lab manager

① 1E-NL 11/9, DM 12/2/22

END OF CULTURE



## MAINTENANCE LOG FOR FLOW-THROUGH CULTURE TUBS

LOCATION: Bath 6

Organism (A): <u>M. sp</u>	Batch Number: <u>T5120622.0</u>	Date Received: <u>12/16/22</u>	Initial # of Organisms: <u>—</u>	10% Mort = <u>—</u>
Organism (B):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =
Organism (C):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =
Organism (D):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =
Organism (E):	Batch Number:	Date Received:	Initial # of Organisms:	10% Mort =

Date	Feed AM/PM	Organism (A, B, C, D, or E)	D.O.	Temp (°C)	Cond/ (sal)	pH	H <sub>2</sub> O Change	Organisms appear healthy (Y/N)	# Mort	Cumulative # Mort*	Init.	Comments
12/7	- ✓	A	6.5	11.0	31	7.5	FT	Y	0	0	UG	
12/8	✓ -	A	6.7	14.3	31	7.5	FT	Y	0	0	BY	
12/11	- ✓	A	6.3	15.0	30	7.5	FT	Y	1	1	UG	
12/13	✓ -	A	6.5	15.0	30	7.5	FT	Y	0	1	UG	
12/15	- ✓	A	7.0	14.4	31	7.6	FT	Y	0	1	UG	
12/18	- ✓	A	6.5	14.0	31	7.4	FT	Y	0	1	UG	
12/20	✓ -	A	7.4	13.6	30	7.6	FT	Y	0	1	UG	
<del>End of culture</del>												

FT = Flow-through

\*For all days of a given batch; if >10% notify lab manager

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