
Data Report
Sediment Characterization
West Sound Marina, Orcas Island
East Sound, Washington
FSID #12312587, CSID #15333

Prepared for:

West Sound Marina, Orcas Island
East Sound, WA

June 2022

Prepared by:

Coho 
Environmental

Seattle, WA

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Acronyms and Abbreviations

CSL	cleanup screening level
DNR	Washington State Department of Natural Resources

Ecology	Washington State Department of Ecology
GPS	global positioning system
HPAH	high-molecular weight PAHs
LCS	laboratory control standard
LPAH	low-molecular weight PAHs
MS	matrix spike
MSD	matrix spike duplicate
OC	organic carbon
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
QAPP	Quality Assurance Project Plan
SCO	sediment cleanup objective
SCUM	Sediment Cleanup User's Manual
SMS	Sediment Management Standards
SVOCs	semi-volatile organic compounds
TBT	tributyltin
TOC	total organic carbon
WAC	Washington Administrative Code
WSM	West Sound Marina

1 Introduction

West Sound Marina (WSM) leases state-owned aquatic lands from the Washington State Department of Natural Resources (DNR; Aquatic Lands Lease No. 20-B12555, September 16, 2020). Section 8 of the DNR lease requires WSM to assess, report and manage hazardous substances on DNR-managed lands. Sediment sampling conducted in 2020 identified concentrations of several hazardous substances above applicable state standards (Jen-Jay 2020). Additional sediment characterization was conducted in May 2022 to further characterize the nature and extent of sediment contamination at the marina.

2 Methods

The methods used to collect the sediment data are described in the Quality Assurance Project Plan (QAPP) for the project and are briefly summarized below (Coho Environmental 2021).

2.1 STUDY DESIGN

This study was intended to provide additional data for determining whether or not chemical concentrations in the marina require cleanup. Two separate sediment sampling designs were implemented, one for characterizing tributyltin (TBT) near the pressure wash pad associated with the Travelift (Stations 2, 4, and 5) and the other to characterize polycyclic aromatic hydrocarbons (PAHs) along the fuel dock at the southern edge of the marina (Stations 1, A, B, C, and D)(Figure 1). These are the hazardous substances and areas above state standards that were identified in the 2020 investigation.

A composite sediment sample was created from individual samples collected from Stations 2, 4, and 5. This sample was analyzed for TBT and total organic carbon (TOC). The composite sample was also archived for possible bioaccumulation testing. Individual aliquots from each of the three stations were also archived.

Similarly, a composite sample was created from individual samples collected from Stations 1, A, B, C and D. This sample was analyzed for PAHs, TOC, ammonia, and total sulfides. The composite sample was also archived for possible toxicity testing and individual aliquots from each of the five stations were also archived.

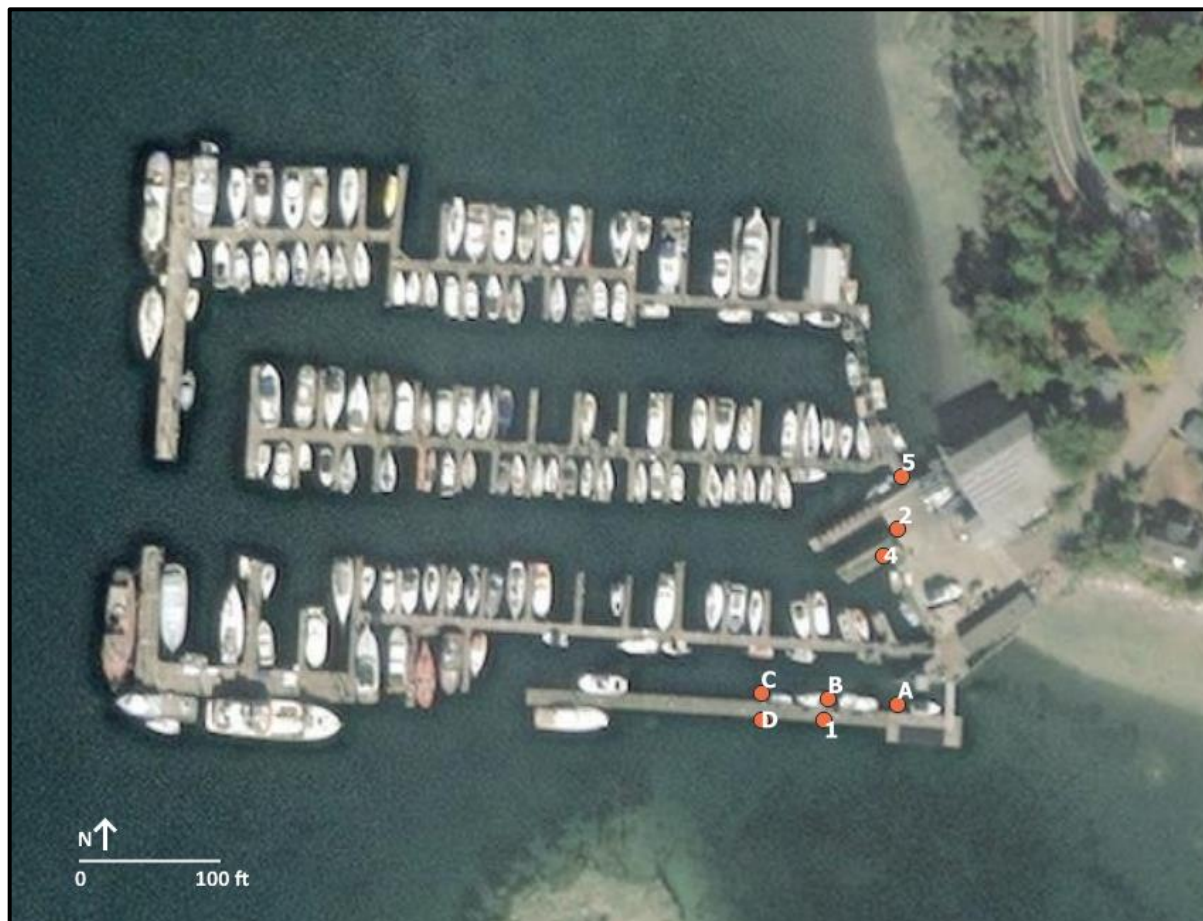


Figure 1. Sediment sampling locations

2.2 FIELD METHODS

The target sampling locations are adjacent to, and some were under, floating structures in the marina. Consequently, SCUBA divers were used to collect sediment samples by hand using a stainless steel scoop. Sample collection was limited to the top 15 cm of the sediment surface.

Because the study design described in Section 2.1 included the potential for bioaccumulation and/or toxicity testing, large volumes of sediment were collected. Approximately 15 L of sediment were collected at each of the three stations that comprised the composite sample for TBT analysis (Stations 2, 4, and 5). The total volume of this composite sample, which was potentially subject to bioaccumulation testing, was approximately 45 L. Sediment from each station was collected by the diver in a 19 L plastic bucket, which was then brought to the surface and emptied into separate 19 L stainless steel bowls, one for each station, where they were homogenized.

A composite sample was also created from individual sediment samples collected at Stations 1, A, B, C, and D. The total volume of this composite sample, which was potentially

subject to toxicity testing, was 8 L. A single 8-L sediment sample was also collected at Station REF, for potential toxicity testing. The individual sediment samples were collected using the same methods as described above.

Prior to forming the composite samples, aliquots from each individual sample were archived for potential future analysis of the target analytes described in Section 2.3. Sample jars were also filled for each of the two composite samples described above by taking an equal amount of sediment from each of the individual sample bowls.

The percent of fine sediment (i.e., silt and clay, sediment particles with diameter less than 63 µm) in the composite sample and reference sample that were potentially subject to toxicity testing was determined in the field using the procedure described in Section 9.1 of the QAPP. Briefly, this procedure entails measuring the volume of sediment in a 50 mL subsample that does not pass through a sieve with 63-µm openings. This volume is then converted to percent fines using the following equation:

$$\text{Percent fines} = (50 \text{ mL} - \text{Volume retained on sieve in mL}) \times 2$$

2.3 LABORATORY METHODS

The chemical analytical methods used by the analytical laboratory (Eurofins Seattle) are specified in Table 1. Some of the analyses were put on hold until the initial analyses were completed. For example, all the analyses of the REF sample were to be conducted only if toxicity testing was warranted, based on the PAH results. Also, bioaccumulation and toxicity testing were put on hold until chemistry results were available. The methods for bioaccumulation and toxicity testing are described in Sections 7.1.3 and 9.2.5 of the QAPP.

Table 1. Chemical analytical methods

Analyte	Analysis Method	Analyzed or Held		
		TBT Composite	PAH Composite	REF
TBT	EPA 8270E-SIM	Analyzed	—	Held
PAHs	EPA 8270E	—	Analyzed	Held
Other SVOCs	EPA 8270E	—	—	Held
TOC	EPA 9060A	Analyzed	Analyzed	Held
Total solids	SM 2540 G-97	Analyzed	Analyzed	Held
Ammonia	SM 4500-NH3 H-97	—	Analyzed	Held
Sulfides	SM 4500-S2 D-00	—	Analyzed	Analyzed
PCBs as Aroclors	EPA 8082A	—	—	Held
Metals	EPA 6020B	—	—	Held
Mercury	EPA 7471A	—	—	Held

— = sample not collected

3 Results

3.1 FIELD RESULTS

Sediment sampling was conducted on May 17, 2022. Samples were collected from nine individual stations listed on Table 2. Two composite samples (TBTcomp_051722 and PAHcomp_051722) were formed from eight of these stations (all but REF), as described in Section 2.1. The coordinates for the stations that were previously sampled in 2020 (2, 4, 5, 1, and D) match those from the 2020 investigation. Stations A, B, and C were moved slightly from the planned locations to accommodate a more accurate deployment of the GPS equipment, but all were within 2 m of the planned locations.

Table 2. Sediment sampling stations

Station	Planned Location ^a		Actual Location ^a		Difference (m)
	Latitude	Longitude	Latitude	Longitude	
2	48.62935	-122.95703	48.62935	-122.95703	0
4	48.62930	-122.95707	48.62930	-122.95707	0
5	48.62945	-122.95702	48.62945	-122.95702	0
1	48.62899	-122.95724	48.62899	-122.95724	0
A	48.62902	-122.95703	48.62901	-122.95704	1.6
B	48.62903	-122.95723	48.62902	-122.95724	1.4
C	48.62904	-122.95742	48.62903	-122.95742	1.3
D	48.62899	-122.95742	48.62899	-122.95742	0.0
REF	48.62748	-122.95966	48.62748	-122.95980	10.1

^a Horizontal datum NAD83

Percent fines were measured in the field for composite PAHcomp_051722 and the sample from Station REF. The results were 6% and 26% fines, respectively.

The characteristics of the sediment samples were very similar, which is not surprising given their close proximity to each other. Photographs of each individual sample, prior to homogenization, and the composite samples, are provided in Appendix A. The sediment at each location was dark olive in color and consisted primarily of fine to medium sand, with abundant shell hash. The sample from station 2 had a very slight petroleum sheen. No sheen was observed at any other station, nor was a hydrogen sulfide odor noticeable for any sample. Given the sample collection method, it was not possible to determine whether a redox potential discontinuity was present at the sample locations.

3.2 LABORATORY RESULTS

Chemistry results are listed in Table 3 for TBTcomp_051722 and Table 4 for PAHcomp_051722.

Table 3. Sediment chemistry results for TBTcomp_051722

Parameter	Units	Concentration
Tributyltin	µg/kg	31
Total organic carbon (TOC)	mg/kg	16,000 HJ
Total organic carbon (TOC)	%	1.6 HJ
Total solids	%	57.7

Table 4. Sediment chemistry results for PAHcomp_051722

Parameter	Dry Weight Units (µg/kg)	Organic Carbon-Normalized (mg/kg-OC)	Sediment Cleanup Objective (SCO) ^a (mg/kg-OC)	Cleanup Screening Level (CSL) ^a (mg/kg-OC)
PAHs				
Acenaphthene	84	6.5	16	57
Acenaphthylene	48	3.7	66	66
Anthracene	93	7.2	220	1,200
Benzo[a]anthracene	290	22.3	110	270
Benzo[a]pyrene	210	16.2	99	210
Benzo[b]fluoranthene	1,100	85	n/a	n/a
Benzo[g,h,i]perylene	100	7.7	31	78
Benzo[k]fluoranthene	290	22	n/a	n/a
Chrysene	1,000	76.9	110	460
Dibenzo[a,h]anthracene	39	3.0	12	33
Fluoranthene	2,300	177	160	1,200
Fluorene	220	16.9	23	79
Indeno[1,2,3-cd]pyrene	160	12.3	34	88
1-Methylnaphthalene	46	3.5	n/a	n/a
2-Methylnaphthalene	61	4.7	38	64
Naphthalene	41	3.2	99	170
Phenanthrene	1,900	146	100	480
Pyrene	1,600	123	1,000	1,400
Total Benzofluoranthenes ^b	1,390	107	230	450
Total HPAH ^c	7,089	545	960	5,300
Total LPAH ^d	2,447	188	370	780
Other sediment parameters				
Ammonia (NH ₃) as Nitrogen (mg/kg)	43 UJ			
Total organic carbon (TOC)(mg/kg)	13,000 HJ			
Total organic carbon (TOC)(%)	1.3 HJ			
Total sulfides (mg/kg)	610 J			
Total solids (%)	57.4			

All concentrations, except those with a U qualifier, are detected. Concentrations in bold exceed the SCO.

Data qualifiers (laboratory): H – sample was prepped or analyzed beyond the specified holding time, F1 – MS and/or MSD recovery exceeds control limits

Data qualifiers (validation): J – estimated value, U – not detected at the reporting limit shown

- ^a As provided in Washington's Sediment Management Standards (WAC 173-204-562, Table III)
- ^b Total benzo[fluoranthenes represents the sum of the "b", "j", and "k" isomers.
- ^c HPAH = High-molecular weight PAHs. Sum of concentrations for fluoranthene, pyrene, benz[a]anthracene, chrysene, total benzo[fluoranthenes, benzo[a]pyrene, indeno[1,2,3,-c,d]pyrene, dibenzo[a,h]anthracene, and benzo[g,h,i]perylene.
- ^d LPAH = Low-molecular weight PAHs. Sum of concentrations for naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, and anthracene.

The TBT concentration for sample TBTcomp_051722 was 33 µg/kg (Table 3). There are no marine sediment standards for TBT in Washington's Sediment Management Standards. However, this value is below the bioaccumulation trigger of 73 µg/kg established in the Dredged Material Evaluation and Disposal Procedures User Manual (USACE 2021). The bioaccumulation trigger is the sediment concentration above which there is a "reason to believe" that the chemical would accumulate in the tissues of target organisms. For concentrations below the bioaccumulation trigger, there is no such "reason to believe." Based on this result, no bioaccumulation testing was conducted for this sample.

The TBT concentration of 33 µg/kg is also below all the human health risk-based sediment concentrations for ingestion and direct contact with sediment published in Ecology's Sediment Cleanup User's Manual (SCUM), the lowest of which is 34 µg/kg (Ecology 2021). However, the scenarios for which those risk-based sediment concentrations were derived, including beach play by children and subsistence clam digging and net fishing by adults, are not applicable to a commercial marina, particularly for the specific sediment included in the TBT composite. These sediment sampling locations were underneath floating docks and are not accessible to recreational or subsistence activities underwater.

The PAH concentrations in the composite sample PAHcomp_051722 are generally well below the Sediment Cleanup Objective (SCO), including the results for low-molecular weight PAHs (LPAHs) and high-molecular weight PAHs (HPAHs), which incorporate all the individual PAH compounds. The LPAH and HPAH results were approximately 50% of the SCO values. Two individual PAH compounds fluoranthene (a component of HPAH) and phenanthrene (a component of LPAH) slightly exceeded the SCO values, but were well below the Cleanup Screening Levels (CSL). Based on these PAH results, no toxicity testing was warranted or conducted.

3.3 DATA VALIDATION RESULTS

Data validation results are discussed in separate sections below for each analytical group.

3.3.1 Semi-volatile organic compounds (SVOCs), including PAHs and tributyltin

The samples were extracted and analyzed within the recommended holding times. The surrogate percent recoveries were within control limits. There were no target compounds detected in the method blank. The laboratory control sample (LCS) percent recoveries were within control limits.

The matrix spike/matrix spike duplicate (MS/MSD) recoveries for the preparation and analytical batches that included sample TBTcomp_051722 were outside control limits. Sample matrix interference was likely responsible for the deviation because the associated LCS recovery was within acceptance limits. The MS/MSD samples were from an unrelated project, so the suspected matrix issues are also unrelated to the West Sound Marina project, so no data qualifiers were added to the TBT result.

No data qualifiers were assigned to SVOC results based on the data validation.

3.3.2 Conventional parameters (TOC, ammonia, and sulfides)

The samples were prepared and analyzed within the recommended holding times, except for TOC. Reanalysis of the TOC samples were performed outside of the analytical holding time due to acid treatment requiring multiple days. A validation qualifier of J (estimated value) was added to the TOC results. Estimated results are still usable for project decision-making.

There were no target compounds detected in the method blanks. The LCS percent recoveries were within control limits.

The MS recoveries and sample duplicate precision for preparation and analytical batches for ammonia were outside control limits. A validation qualifier of J was added to the non-detect result.

The MSD recoveries for preparation and analytical batches for sulfides were outside control limits. Sample matrix interference was likely responsible for the deviation because the associated LCS recovery was within acceptance limits. A validation qualifier of J was added to the sulfide result.

3.4 CONCLUSIONS

The results from the two composite sediment samples were evaluated in the context of the primary objective of this study, which was to determine whether or not chemical concentrations in the marina sediments require cleanup. This evaluation was conducted following guidelines in the Sediment Management Standards (SMS; WAC 173-204-510 and 173-204-520), as described in Chapter 2 of SCUM (Ecology 2021). According to SMS, station clusters of potential concern are defined as those that exceed the CSL. None of the results from this study exceeded applicable CSL values, so there is no station cluster of potential concern at the marina. Sediment conditions appear to have improved since the 2020 investigation was completed.

No further evaluation is warranted for benthic toxicity unless new information indicates an increase in chemical concentrations (WAC 173-204-510). Consequently, no Remedial Investigation/Feasibility Study or sediment cleanup is warranted and the site should not be identified as a cleanup site.

4 References

- Coho Environmental. 2021. Quality Assurance Project Plan. Sediment sampling. West Sound Marina, Orcas Island (WA). FSI #12312587, CSID #15333. Coho Environmental, Seattle, WA
- Ecology. 2021. Sediment Cleanup Users Manual (SCUM). Guidance for implementing the cleanup provisions of the Sediment Management Standards, Chapter 173-204 WAC. Third revision December 2021. Pub. No. 12-09-057. Toxics Cleanup Program, Washington State Department of Ecology, Olympia, WA
- Jen-Jay. 2020. Benthic sediment sampling. West Sound Marina. 5 June 2020. Prepared for West Sound Marina. Jen-Jay, Inc., Deer Harbor, WA
- USACE. 2021. Dredged material evaluation and disposal procedures. User manual. Dredged Material Management Program (Corps of Engineers, Seattle District; Environmental Protection Agency, Region 10; Washington State Department of Natural Resources; Washington State Dep. US Army Corps of Engineers, Seattle District, Dredged Material Management Office, Seattle, WA

Appendix A Sediment Sample Photographs



Station 2



Station 4



Station 5



Station 1



Station A



Station B



Station C



Station D



Station REF

Appendix B Laboratory Reports

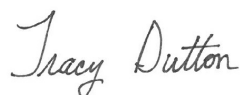
ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-113931-1
Client Project/Site: West Sound Marina

For:
Coho Environmental LLC
533 NE 90th St
Seattle, Washington 98115

Attn: Tad Deshler



Authorized for release by:
6/16/2022 12:18:32 AM

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Job ID: 580-113931-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-113931-1

Comments

No additional comments.

Receipt

The samples were received on 5/18/2022 12:20 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 6.5° C.

GC/MS Semi VOA

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

General Chemistry

Method 350.1/Plumb: The matrix spike (MS) recoveries for preparation batch 580-391249 and analytical batch 580-391449 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 350.1/Plumb: The sample duplicate (DUP) precision for preparation batch 580-391249 and analytical batch 580-391449 was outside control limits. Sample matrix interference is suspected.

Method 9060_PSEP: The sample duplicate (DUP) precision for analytical batch 580-392690 was outside control limits. Sample matrix interference is suspected.

Method 9060_PSEP: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to acid treatment required multiple days causing the samples to run out of hold time. : PAHCOMP_051722 (580-113931-1).

Method 9034: The matrix spike duplicate (MSD) recoveries for preparation batch 280-575968 and analytical batch 280-576027 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

Organic Prep

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

Definitions/Glossary

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control limits
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

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

Client Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Client Sample ID: PAHCOMP_051722

Lab Sample ID: 580-113931-1

Date Collected: 05/17/22 10:15

Matrix: Solid

Date Received: 05/18/22 12:20

Percent Solids: 57.4

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	84		7.6	0.91	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Acenaphthylene	48		7.6	0.76	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Anthracene	93		7.6	0.91	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Benzo[a]anthracene	290		7.6	2.7	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Benzo[a]pyrene	210		7.6	1.3	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Benzo[b]fluoranthene	1100		7.6	1.8	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Benzo[g,h,i]perylene	100		7.6	0.76	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Benzo[k]fluoranthene	290		7.6	0.91	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Chrysene	1000		7.6	2.3	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Dibenz(a,h)anthracene	39		7.6	1.1	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Fluoranthene	2300		7.6	2.1	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Fluorene	220		7.6	0.76	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Indeno[1,2,3-cd]pyrene	160		7.6	0.91	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
1-Methylnaphthalene	46		7.6	0.96	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
2-Methylnaphthalene	61		7.6	3.1	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Naphthalene	41		7.6	2.5	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Phenanthrene	1900		7.6	2.5	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1
Pyrene	1600		7.6	1.5	ug/Kg	☆	05/23/22 18:26	05/28/22 22:55	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14	97		57 - 145	05/23/22 18:26	05/28/22 22:55	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	610	F1	17	7.4	mg/Kg	☆	05/24/22 09:15	05/24/22 13:14	1
Total Organic Carbon - Duplicates	13000	H	2000	97	mg/Kg			06/02/22 21:05	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	57.4		0.1	0.1	%			05/23/22 16:37	1
Percent Moisture	42.6		0.1	0.1	%			05/23/22 16:37	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND	F1 F2	43	43	mg/Kg	☆		05/21/22 23:59	1

QC Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 580-391586/1-A

Matrix: Solid

Analysis Batch: 392238

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 391586

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	ND		5.0	0.60	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Acenaphthylene	ND		5.0	0.50	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Anthracene	ND		5.0	0.60	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Benzo[a]anthracene	ND		5.0	1.8	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Benzo[a]pyrene	ND		5.0	0.84	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Benzo[b]fluoranthene	ND		5.0	1.2	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Benzo[g,h,i]perylene	ND		5.0	0.50	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Benzo[k]fluoranthene	ND		5.0	0.60	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Chrysene	ND		5.0	1.5	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Dibenz(a,h)anthracene	ND		5.0	0.72	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Fluoranthene	ND		5.0	1.4	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Fluorene	ND		5.0	0.50	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Indeno[1,2,3-cd]pyrene	ND		5.0	0.60	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
1-Methylnaphthalene	ND		5.0	0.63	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
2-Methylnaphthalene	ND		5.0	2.1	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Naphthalene	ND		5.0	1.6	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Phenanthrene	ND		5.0	1.6	ug/Kg		05/23/22 18:26	05/28/22 17:47	1
Pyrene	ND		5.0	0.97	ug/Kg		05/23/22 18:26	05/28/22 17:47	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Terphenyl-d14	111		57 - 145	05/23/22 18:26	05/28/22 17:47	1

Lab Sample ID: LCS 580-391586/2-A

Matrix: Solid

Analysis Batch: 392238

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 391586

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Acenaphthene	1000	905		ug/Kg		91	65 - 120
Acenaphthylene	1000	854		ug/Kg		85	66 - 120
Anthracene	1000	902		ug/Kg		90	53 - 132
Benzo[a]anthracene	1000	927		ug/Kg		93	66 - 127
Benzo[a]pyrene	1000	842		ug/Kg		84	66 - 124
Benzo[b]fluoranthene	1000	929		ug/Kg		93	54 - 122
Benzo[g,h,i]perylene	1000	935		ug/Kg		94	61 - 128
Benzo[k]fluoranthene	1000	887		ug/Kg		89	51 - 131
Chrysene	1000	888		ug/Kg		89	57 - 128
Dibenz(a,h)anthracene	1000	971		ug/Kg		97	64 - 133
Fluoranthene	1000	962		ug/Kg		96	64 - 130
Fluorene	1000	914		ug/Kg		91	62 - 126
Indeno[1,2,3-cd]pyrene	1000	907		ug/Kg		91	63 - 132
1-Methylnaphthalene	1000	940		ug/Kg		94	64 - 120
2-Methylnaphthalene	1000	889		ug/Kg		89	64 - 120
Naphthalene	1000	936		ug/Kg		94	65 - 120
Phenanthrene	1000	927		ug/Kg		93	63 - 120
Pyrene	1000	935		ug/Kg		94	62 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Terphenyl-d14	98		57 - 145

Eurofins Seattle

QC Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Method: 350.1/Plumb - Nitrogen, Ammonia

Lab Sample ID: MB 580-391449/1
Matrix: Solid
Analysis Batch: 391449

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

Analyte	MB Result	MB Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Ammonia	ND		1.0	1.0	mg/Kg			05/21/22 23:59	1

Lab Sample ID: 580-113931-1 MS
Matrix: Solid
Analysis Batch: 391449

Client Sample ID: PAHCOMP_051722
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Ammonia	ND	F1 F2	85.0	103	F1	mg/Kg	✱	121	90 - 110

Lab Sample ID: 580-113931-1 MSD
Matrix: Solid
Analysis Batch: 391449

Client Sample ID: PAHCOMP_051722
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Ammonia	ND	F1 F2	84.8	83.5	F2	mg/Kg	✱	99	90 - 110	21	20

Lab Sample ID: 580-113931-1 DU
Matrix: Solid
Analysis Batch: 391449

Client Sample ID: PAHCOMP_051722
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Ammonia	ND	F1 F2	ND		mg/Kg	✱	NC	20

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 280-575968/2-A
Matrix: Solid
Analysis Batch: 576027

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 575968

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		9.9	4.2	mg/Kg		05/24/22 09:15	05/24/22 13:14	1

Lab Sample ID: LCS 280-575968/1-A
Matrix: Solid
Analysis Batch: 576027

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 575968

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	99.3	80.4		mg/Kg		81	35 - 119

Lab Sample ID: 580-113931-1 MS
Matrix: Solid
Analysis Batch: 576027

Client Sample ID: PAHCOMP_051722
Prep Type: Total/NA
Prep Batch: 575968

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	610	F1	164	669		mg/Kg	✱	37	35 - 119

Eurofins Seattle

QC Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric) (Continued)

Lab Sample ID: 580-113931-1 MSD

Matrix: Solid

Analysis Batch: 576027

Client Sample ID: PAHCOMP_051722

Prep Type: Total/NA

Prep Batch: 575968

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfide	610	F1	166	631	F1	mg/Kg	☆	14	35 - 119	6	35

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-392690/5

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	97	mg/Kg			06/02/22 20:19	1

Lab Sample ID: LCS 580-392690/6

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Duplicates	120000	112000		mg/Kg		93	80 - 120

Lab Sample ID: LCSD 580-392690/7

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	120000	112000		mg/Kg		94	80 - 120	0	20

Lab Chronicle

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Client Sample ID: PAHCOMP_051722

Lab Sample ID: 580-113931-1

Date Collected: 05/17/22 10:15

Matrix: Solid

Date Received: 05/18/22 12:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	392690	06/02/22 21:05	FCG	FGS SEA
Total/NA	Analysis	D 2216		1	391569	05/23/22 16:37	TMH	FGS SEA

Client Sample ID: PAHCOMP_051722

Lab Sample ID: 580-113931-1

Date Collected: 05/17/22 10:15

Matrix: Solid

Date Received: 05/18/22 12:20

Percent Solids: 57.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3546			391586	05/23/22 18:26	S1B	FGS SEA
Total/NA	Analysis	8270E SIM		1	392238	05/28/22 22:55	TL1	FGS SEA
Soluble	Leach	DI Leach/Plumb			391249	05/19/22 18:12	MLT	FGS SEA
Soluble	Analysis	350.1/Plumb		1	391449	05/21/22 23:59	FCG	FGS SEA
Total/NA	Prep	9030B			575968	05/24/22 09:15	ZPM	TAL DEN
Total/NA	Analysis	9034		1	576027	05/24/22 13:14	ZPM	TAL DEN

Laboratory References:

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

TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Laboratory: Eurofins Seattle

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
350.1/Plumb		Solid	Ammonia
9060_PSEP		Solid	Total Organic Carbon - Duplicates
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C583-19	08-03-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9034	9030B	Solid	Sulfide

Sample Summary

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113931-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-113931-1	PAHCOMP_051722	Solid	05/17/22 10:15	05/18/22 12:20

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

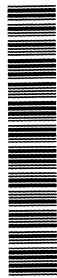
Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

[illegible]

 eurofins

Environment Testing
America

[illegible]

Login Sample Receipt Checklist

Client: Coho Environmental LLC

Job Number: 580-113931-1

Login Number: 113931

List Source: Eurofins Seattle

List Number: 1

Creator: Vallelunga, Diana L

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

Login Sample Receipt Checklist

Client: Coho Environmental LLC

Job Number: 580-113931-1

Login Number: 113931

List Number: 2

Creator: Rystrom, Joshua R

List Source: Eurofins Denver

List Creation: 05/21/22 12:12 PM

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



Environment Testing America

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-113943-1
Client Project/Site: West Sound Marina

For:
Coho Environmental LLC
533 NE 90th St
Seattle, Washington 98115

Attn: Tad Deshler

Authorized for release by:
6/16/2022 12:28:59 AM

Tracy Dutton, Client Relations Manager
(253)380-6574
Tracy.Dutton@et.eurofinsus.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Job ID: 580-113943-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-113943-1

Comments

No additional comments.

Receipt

The samples were received on 5/18/2022 12:20 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.8° C.

GC/MS Semi VOA

Method Organotins SIM: The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 570-236301 and analytical batch 570-237152 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

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

General Chemistry

Method 9034: The matrix spike duplicate (MSD) recoveries for preparation batch 280-575968 and analytical batch 280-576027 were outside control limits. Sample matrix interference is suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 9060_PSEP: The sample duplicate (DUP) precision for analytical batch 580-392690 was outside control limits. Sample matrix interference is suspected.

Method 9060_PSEP: Reanalysis of the following sample(s) was performed outside of the analytical holding time due to acid treatment required multiple days causing the samples to run out of hold time. : TBTCOMP_051722 (580-113943-1).

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

Organic Prep

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

Definitions/Glossary

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
F3	Duplicate RPD exceeds the control limit
H	Sample was prepped or analyzed beyond the specified holding time

Glossary

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

Client Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Client Sample ID: TBTCOMP_051722

Lab Sample ID: 580-113943-1

Date Collected: 05/17/22 12:15

Matrix: Solid

Date Received: 05/18/22 12:20

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	16000	H	2000	97	mg/Kg			06/02/22 20:28	1
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Solids	57.7		0.1	0.1	%			05/23/22 16:37	1
Percent Moisture	42.3		0.1	0.1	%			05/23/22 16:37	1

Client Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Client Sample ID: TBTCOMP_051722

Lab Sample ID: 580-113943-1

Date Collected: 05/17/22 12:15

Matrix: Solid

Date Received: 05/18/22 12:20

Percent Solids: 57.7

Method: Organotins SIM - Organotins (GC/MS SIM)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	33		5.2	2.3	ug/Kg	☆	05/23/22 15:12	05/26/22 17:23	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
Tripentyltin	106		39 - 150				05/23/22 15:12	05/26/22 17:23	1

Client Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Client Sample ID: REF_051722
Date Collected: 05/17/22 11:00
Date Received: 05/18/22 12:20

Lab Sample ID: 580-113943-2
Matrix: Solid

General Chemistry									
Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	30.5		0.1	0.1	%			05/27/22 10:07	1
Percent Solids	69.5		0.1	0.1	%			05/27/22 10:07	1

Client Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Client Sample ID: REF_051722

Lab Sample ID: 580-113943-2

Date Collected: 05/17/22 11:00

Matrix: Solid

Date Received: 05/18/22 12:20

Percent Solids: 69.5

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	240		14	6.0	mg/Kg	☼	05/24/22 09:15	05/24/22 13:14	1

QC Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Method: Organotins SIM - Organotins (GC/MS SIM)

Lab Sample ID: MB 570-236301/1-A

Matrix: Solid

Analysis Batch: 237152

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 236301

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Tributyltin	ND		3.0	1.3	ug/Kg		05/23/22 15:12	05/26/22 15:32	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
Triphenyltin	105		39 - 150				05/23/22 15:12	05/26/22 15:32	1

Lab Sample ID: LCS 570-236301/2-A

Matrix: Solid

Analysis Batch: 237152

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 236301

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Tributyltin	20.0	22.0		ug/Kg		110	10 - 126
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
Triphenyltin	94		39 - 150				

Lab Sample ID: LCSD 570-236301/3-A

Matrix: Solid

Analysis Batch: 237435

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 236301

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Tributyltin	20.0	17.3		ug/Kg		86	10 - 126	24	30
Surrogate	LCSD %Recovery	LCSD Qualifier	Limits						
Triphenyltin	103		39 - 150						

Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

Lab Sample ID: MB 280-575968/2-A

Matrix: Solid

Analysis Batch: 576027

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 575968

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide	ND		9.9	4.2	mg/Kg		05/24/22 09:15	05/24/22 13:14	1

Lab Sample ID: LCS 280-575968/1-A

Matrix: Solid

Analysis Batch: 576027

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 575968

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide	99.3	80.4		mg/Kg		81	35 - 119

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: MB 580-392690/5

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon - Duplicates	ND		2000	97	mg/Kg			06/02/22 20:19	1

Eurofins Seattle

QC Sample Results

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Method: 9060_PSEP - TOC (Puget Sound)

Lab Sample ID: LCS 580-392690/6

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Duplicates	120000	112000		mg/Kg		93	80 - 120

Lab Sample ID: LCSD 580-392690/7

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	120000	112000		mg/Kg		94	80 - 120	0	20

Lab Sample ID: 580-113943-1 MS

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: TBTCOMP_051722

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Total Organic Carbon - Duplicates	16000	H	120000	132000		mg/Kg		97	75 - 125

Lab Sample ID: 580-113943-1 MSD

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: TBTCOMP_051722

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Total Organic Carbon - Duplicates	16000	H	120000	132000		mg/Kg		97	75 - 125	0	20

Lab Sample ID: 580-113943-1 DU

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: TBTCOMP_051722

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Total Organic Carbon - Duplicates	16000	H	21000	F3	mg/Kg		30	20

Lab Sample ID: 580-113943-1 TRL

Matrix: Solid

Analysis Batch: 392690

Client Sample ID: TBTCOMP_051722

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	TRL Result	TRL Qualifier	Unit	D	RSD	RSD Limit
Total Organic Carbon - Duplicates	16000	H	22900		mg/Kg		19	20

Method: Moisture - Percent Moisture

Lab Sample ID: 580-113943-2 DU

Matrix: Solid

Analysis Batch: 576400

Client Sample ID: REF_051722

Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	30.5		34.7		%		13	20
Percent Solids	69.5		65.3		%		6	20

Eurofins Seattle

Lab Chronicle

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Client Sample ID: TBTCOMP_051722

Lab Sample ID: 580-113943-1

Date Collected: 05/17/22 12:15

Matrix: Solid

Date Received: 05/18/22 12:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	9060_PSEP		1	392690	06/02/22 20:28	FCG	FGS SEA
Total/NA	Analysis	D 2216		1	391569	05/23/22 16:37	TMH	FGS SEA

Client Sample ID: TBTCOMP_051722

Lab Sample ID: 580-113943-1

Date Collected: 05/17/22 12:15

Matrix: Solid

Date Received: 05/18/22 12:20

Percent Solids: 57.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	Organotin Prep			236301	05/23/22 15:12	UWEZ	ECL 4
Total/NA	Analysis	Organotins SIM		1	237152	05/26/22 17:23	ULLI	ECL 4

Client Sample ID: REF_051722

Lab Sample ID: 580-113943-2

Date Collected: 05/17/22 11:00

Matrix: Solid

Date Received: 05/18/22 12:20

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1	576400	05/27/22 10:07	ZPM	TAL DEN

Client Sample ID: REF_051722

Lab Sample ID: 580-113943-2

Date Collected: 05/17/22 11:00

Matrix: Solid

Date Received: 05/18/22 12:20

Percent Solids: 69.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	9030B			575968	05/24/22 09:15	ZPM	TAL DEN
Total/NA	Analysis	9034		1	576027	05/24/22 13:14	ZPM	TAL DEN

Laboratory References:

ECL 4 = Eurofins Calscience Tustin, 2841 Dow Avenue, Tustin, CA 92780, TEL (714)895-5494

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

TAL DEN = Eurofins Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

Accreditation/Certification Summary

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Laboratory: Eurofins Seattle

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C788	07-13-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9060_PSEP		Solid	Total Organic Carbon - Duplicates
D 2216		Solid	Percent Moisture
D 2216		Solid	Percent Solids

Laboratory: Eurofins Calscience

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
California	Los Angeles County Sanitation Districts	10109	09-30-22
California	SCAQMD LAP	17LA0919	12-01-22
California	State	2944	09-30-22
Guam	State	21-003R	06-22-22
Nevada	State	CA00111	07-31-22
Oregon	NELAP	4175	01-31-23
USDA	US Federal Programs	P330-20-00034	02-10-23
Washington	State	C916-18	10-12-22

Laboratory: Eurofins Denver

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

Authority	Program	Identification Number	Expiration Date
Washington	State	C583-19	08-03-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9034	9030B	Solid	Sulfide
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Sample Summary

Client: Coho Environmental LLC
Project/Site: West Sound Marina

Job ID: 580-113943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-113943-1	TBTCOMP_051722	Solid	05/17/22 12:15	05/18/22 12:20
580-113943-2	REF_051722	Solid	05/17/22 11:00	05/18/22 12:20

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Chain of Custody Record

Tacoma, WA 98424-1317
phone 253.922.2310 fax 253.922.5047

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☒ Other:

TestAmerica Laboratories, Inc. d/b/a Eurofins TestAmerica

Client Contact		Project Manager: Tad Deshler		Site Contact:		Date: 5/18/22		COC No:															
Coho Environmental LLC		Tel/Fax: (206) 778-9274		Lab Contact: Tracy Dutton		Carrier:		2 of 2															
533 NE 90th St.		Analysis Turnaround Time						TALS Project #:															
Seattle		☒ CALENDAR DAYS ☐ WORKING DAYS						Sampler: TD															
(206) 778-9274		TAT if different from Below _____						For Lab Use Only:															
Project Name: West Sound Marina		☐ 2 weeks						Walk-in Client: _____															
Site:		☒ 1 week						Lab Sampling: _____															
P O #		☐ 2 days						Job / SDG No.: _____															
		☐ 1 day																					
Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	TBT	TOC	% solids	Total sulfides	Mercury (hold for further instructions)	Metals (hold for further instructions)	SVOCs (hold for further instructions)	PCBs (hold for further instructions)	TOC (hold for further instructions)	% solids (hold for further instructions)	TBT (hold for further instructions)	Ammonia (hold for further instructions)	Sample Specific Notes:			
TBTcomp_051722	5/17/2022	1215	C	Sed	3	N	x	x	x														
REF_051722	5/17/2022	1100	G	Sed	9	N					x	x	x	x	x	x	x	x					
2_051722	5/17/2022	1215	G	Sed	3	N										x	x	x					
4_051722	5/17/2022	1230	G	Sed	3	N										x	x	x					
5_051722	5/17/2022	1200	G	Sed	3	N										x	x	x					
																							
						580-113943 Chain of Custody																	
						Therm. ID: 1R9 Cor: 3.8 ° Unc: 4.2 °																	
						Cooler Dsc: BB																	
						Packing: BJB FedEx: _____																	
						Cust. Seal: Yes ☒ No _____ UPS: _____																	
						Blue Ice, ☒ Wet ☐ Dry, None _____ Lab Cour: ☒ Other: _____																	
Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other _____																							
Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.						Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)																	
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown						☐ Return to Client ☐ Disposal by Lab ☒ Archive for _____ Months																	
Special Instructions/QC Requirements & Comments: Metals include As, Cd, Cr, Cu, Pb, Ag, Zn																							
Custody Seals Intact: ☐ Yes ☐ No						Custody Seal No.:						Cooler Temp. (°C): Obs'd: _____ Cor'd: _____						Therm ID No.:					
Relinquished by: Tad Deshler						Company: Coho Environmental						Date/Time: 5/18/22 12:20						Received by: Sydney Lamm					
Relinquished by:						Company:						Date/Time:						Received by:					
Relinquished by:						Company:						Date/Time:						Received in Laboratory by:					

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ORIGIN ID:TCMA (253) 922-2310
 SAMPLE RECEIVING
 EUROFINS FRONTIER GLOBAL- SEATTLE
 5755 8TH ST E

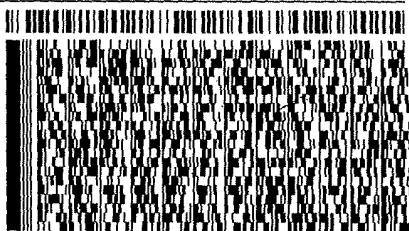
FIFE, WA 98424
 UNITED STATES US

TO SHIPPING/RECEIVING
 EUROFINS ENVIRONMEN
 2841 DOW AVENUE, SUIT

TUSTIN CA 92780

(714) 895-5494
 PO YES

REF 8580-4886



TRK# 5812 3868 398
 0201

92 DTH

RT 67
 ST 6

2670891

Custody Seal

DATE

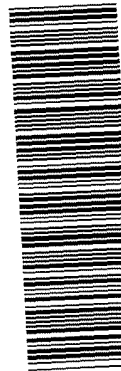
SIGNATURE

5/19/22

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Environment Testing
 TestAmerica

eurofins



580-113943 Waybill

5755 8th Street East
Tacoma, WA 98424
Phone: 253-922-2310



Chain of Custody Record

Environment Testing
America

Client Information (Sub Contract Lab)				Sample#:		Lab PM:		Carrier Tracking No(s):		COC No:	
Client Contact:				Phone:		Dutton, Tracy L		State of Origin:		580-104071.1	
Shipping/Receiving				Company:		Tracy Dutton@eurofinsus.com		Washington		Page: 1 of 1	
TestAmerica Laboratories, Inc.				Address:		State - Washington		Accreditations Required (See note):		Job #:	
Address:				City:		Due Date Requested:		Analysis Requested		Preservation Codes:	
4955 Yarrow Street,				Arvada		5/24/2022		Analysis Requested Field Filtered Sample (Yes or No) Perform MS/MSD (Yes or No) 9034/9030B Total Sulfides (Plumb) Total Number of Containers 1		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Nitric Acid R - NaHSO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify) Other:	
City:				TAT Requested (days):							
State, Zip:											
Phone:				PO #:							
Email:				WFO #:							
Project Name:				Project #:		Sample Date		Sample Time		Sample Matrix	
West Sound Marina				58017816		5/17/22		11:00 Pacific		Solid	
Site:				SSOW#:		Sample Date		Sample Time		Sample Matrix	
Sample Identification - Client ID (Lab ID)				Sample Date		Sample Time		Sample Matrix		Preservation Code:	
REF_051722 (580-113943-2)				5/17/22		11:00 Pacific		Solid		X	
Sample Identification - Client ID (Lab ID) Since laboratory accreditations are subject to change, Eurofins Environment Testing Northwest, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing Northwest, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing Northwest, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing Northwest, LLC.				Field Filtered Sample (Yes or No)		Perform MS/MSD (Yes or No)		9034/9030B Total Sulfides (Plumb)		Total Number of Containers	
Possible Hazard Identification				Unconfirmed		Primary Deliverable Rank: 2		Special Instructions/OC Requirements:		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
Deliverable Requested: I, II, III, IV, Other (specify)										☐ Return To Client ☐ Disposal By Lab ☐ Archive For Months	
Empty Kit Relinquished by:				Date:		Time:		Method of Shipment:		Cooler Temperature(s) °C and Other Remarks:	
Relinquished by:				5/19/22		1545		Company: EENW		Received by: [Signature]	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:	
Relinquished by:				Date/Time:		Company:		Received by:		Date/Time:	
Custody Seals Intact:				Custody Seal No.:							

Ver. 06/08/2021

Login Sample Receipt Checklist

Client: Coho Environmental LLC

Job Number: 580-113943-1

Login Number: 113943

List Source: Eurofins Seattle

List Number: 1

Creator: Vallelunga, Diana L

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

Login Sample Receipt Checklist

Client: Coho Environmental LLC

Job Number: 580-113943-1

Login Number: 113943

List Number: 2

Creator: Ornelas, Olga

List Source: Eurofins Calscience

List Creation: 05/20/22 03:22 PM

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

Login Sample Receipt Checklist

Client: Coho Environmental LLC

Job Number: 580-113943-1

Login Number: 113943

List Number: 3

Creator: Rystrom, Joshua R

List Source: Eurofins Denver

List Creation: 05/21/22 12:12 PM

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