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ENVIRONMENTAL CONDITIONS REPORT Cassidy Road Shooting Site CLALLAM COUNTY, WASHINGTON





December 9, 2022 Shannon & Wilson No: 107843-005

#### Submitted To: Washington State Dept. of Natural Resources 1111 Washington Street SE Olympia, WA 98501 Attn: Ms. Amy Sikora

## Subject: ENVIRONMENTAL CONDITIONS REPORT, CASSIDY ROAD SHOOTING SITE, CLALLAM COUNTY, WASHINGTON

Shannon & Wilson prepared this report and participated in this project as a subconsultant to the Washington State Department of Natural Resources. Our scope of services was specified in Agreement Number AE 426 dated October 26, 2021. This report presents our findings, conclusions, and recommendations. This Environmental Conditions Report was prepared by the undersigned.

We appreciate the opportunity to be of service to you on this project. If you have questions concerning this report, or we may be of further service, please contact us.

Sincerely,

SHANNON & WILSON

Christian Canfield Environmental Staff



Meg Strong, LG, LHG Senior Consultant

CTC:MJS/ctc

### EXECUTIVE SUMMARY

The Cassidy Road Shooting Site is in located in Clallam County (Latitude 48.058008, and Longitude -123.230539) (Figure 1). A complaint was filed with the Washington State Department of Ecology (Ecology) in 2000 by a member of the public concerning potential litter and lead contamination at the Cassidy Road Shooting site (site). In response, Ecology collected three surface soil samples in 2000 from near-surface soil at the site. The results from the three soil samples exceeded the Model Toxics Control Act Method A for unrestricted use (MTCA-A) cleanup levels (CULs) for lead of 250 milligrams per kilogram (mg/kg). Lead contamination was attributed to spent munitions. The Ecology site identification number is 3958.

On August 27, 2003, it was reported to staff from the Clallam County Environmental Health that the area where the soil samples had been collected by Ecology in June 2000 had been since graded over and trees had been planted. . No further characterization related to the extent of contamination was reportedly conducted until 2021. Although a gate restricts access to the site, the public can still access the premises on foot.

In 2022, Shannon & Wilson investigated the site for the presence of near-surface soil contamination. This investigation included the use of an X-ray fluorescence detection device and soil sampling for laboratory analysis. Sampling rationale consisted of a grid-like approach to attempt to delineate the lateral extent of potential contamination.

This Environmental Conditions Report (ECR) evaluates the results of the 2022 investigation and the extent of contamination within the site. Findings, and recommendations from this investigation (e.g., additional sampling to delineate the extent of contamination) are as follows:

- Elevated levels of lead, arsenic, and carcinogenic polycyclic aromatic hydrocarbons (cPAHs) above MTCA-A CULs were detected. Soil sample locations are shown in Figure 2 and elevated levels are shown in Figure 3.
- Three areas of concern shown highlighted in Figure 3 should be removed and disposed at a regulated facility as contaminated soil. We recommend a minimum of a 5-foot lateral distance from the known contaminated soil sample locations and a minimum 1-foot vertical limit of excavation.
- Confirmation soil samples should be collected from the sidewalls and bottom of excavations after contaminated soil removal. Analytical testing of confirmation samples should include the analyte(s) with concentration exceedance(s), with respect to their location, to confirm if the extent of contamination has been removed.

Once confirmation chemical analysis results have demonstrated contaminant concentrations to be below their respective cleanup criterion, the site can be regraded to eliminate the excavation pits.

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### 1 INTRODUCTION

Shannon & Wilson has prepared this ECR related to environmental services associated with the Department of Natural Resources Cassidy Road Shooting Site in Clallam County, Washington (Figure 1). This ECR was prepared in accordance with the accepted proposal, "Scope and Cost Estimate for Environmental Services at Cassidy Road Shooting Site, Clallam County, Washington," dated October 20, 2021.

### 2 SITE BACKGROUND

The Cassidy Road Shooting Site is in located in Clallam County (Latitude 48.058008, and Longitude -123.230539). A complaint was filed with the Washington State Department of Ecology (Ecology) in 2000 by a member of the public concerning potential litter and lead contamination at the Cassidy Road Shooting site. In response, Ecology collected three surface soil samples in 2000 from near-surface soil at the site. The three soil samples exceeded the Model Toxics Control Act Method A for unrestricted use (MTCA-A) cleanup levels (CULs) for lead of 250 milligrams per kilogram (mg/kg). Lead contamination was attributed to spent munitions. The Ecology site identification number is 3958.

On August 27, 2003, it was reported to staff from the Clallam County Environmental Health that the area where the soil samples had been collected in June 2000 had been since graded over and trees had been planted. No further characterization related to the extent of contamination has reportedly been conducted until 2021. Although a gate restricts access to the site, the public can still access the premises on foot. There is a residential area approximately 0.5 mile from the site to the west (see Exhibits 2-1 and 2-2 as follows).



Exhibit 2-1: Cassidy Road Shooting Site, August 2001, Facing South

On February 24, 2004, Ecology conducted a Site Hazard Assessment on the site, which resulted in a hazard ranking of 5 (on a scale of 1 to 5, 5 is the lowest rank).



Exhibit 2-2: 3D Imagery of Cassidy Road Shooting Site, August 2021, Facing Northwest

The primary contaminant of concern (pCOC) is lead in soil from the spent munitions. Other chemicals associated with spent munitions include the metals antimony, arsenic, copper, zinc, and carcinogenic polycyclic aromatic hydrocarbon (cPAH). Antimony is used as a hardener in lead bullets and is associated with lead, where present. Since antimony is co-located with lead, antimony was not investigated as part of the proposed scope of work, while other pCOCs including arsenic, copper, zinc, and cPAHs were investigated. Antimony is generally 4 to 6% of the average lead bullet.

This ECR addresses characterizing of onsite soil to establish if they need treatment or offsite disposal, undertaking sampling in the gravel pit area to assess the distribution and concentrations of pCOCs in the near-surface soil, and mapping the thickness and distribution of pCOCs within the areas of concern. The purpose is to understand how to reduce or remove risk to human health and the environment, and to generate a report to Ecology communicating this information.

### 3 FIELD ACTIVITIES

In advance of any field activity, the One Call number was contacted for utility locating.

Field activities consisted of a site reconnaissance, grab soil samples, and metals soil screening using an X-ray fluorescence (XRF). XRF is the property of a material to emit X-rays, with a characteristic energy, upon being irradiated by X-rays from a known

radioisotope source. The emitted X-rays are detected by the particular XRF instrument as they impact a detector, which converts the energy of the emitted X-ray into electric current. The strength of the current is proportional to the energy of the X-ray. An onboard microprocessor counts how often an energy is detected, assigns the energy to a particular element, and reports the calculated concentration for the element.

A Shannon & Wilson representative visited the site on February 14 and 15 and March 4, 2022. The site was open, flat, and graded.

A grid was set up on the site and used to get representative samples. The grid location was selected during the reconnaissance by the likely contaminant source area, suspected lateral and vertical extents of contaminants, and nearby sensitive receptors. Possible source areas were determined by using historical photographs, aerial imagery, and information provided by local residents. Multiple samples were selected to be analyzed within select locations.

Nine soil samples were collected from the site for metals analysis at the laboratory. Soil samples were selected for laboratory analysis based on multiple factors including XRF results, location, and depth. The laboratory analyzed sample was also used as a quality control measure when an XRF lead calculation was near the MTCA-A cleanup criteria of 250 mg/kg. Samples were collected using a decontaminated trowel or directly with a gloved hand. Select samples were analyzed for:

- PAHs by U.S. Environmental Protection Agency (EPA) Methods 8270 Selective Ion Monitoring
- Arsenic, copper, lead, and zinc by U.S. Environmental Protection Agency (EPA) Method 6020B

Laboratory detection limits were reported below the MTCA-A CULs. Each soil sample was analyzed with the XRF during field activities and those results used to select the sample submitted for qualitative laboratory analysis. Sampling equipment that was re-used was decontaminated prior to initial use, between sampling locations, and at the completion of the site-specific sampling. The sampling locations were established using agrid-like approach and located in the field with an Arrow Series® global positioning device (GPS). Approximate soil and XRF sample locations can be seen in Figure 2.

Select soil samples were transported to Fremont Analytical, Inc., an Ecology accredited third party analytical laboratory, within the appropriate temperature range (between 0 and 6° Celsius). Laboratory samples were submitted on a standard laboratory turnaround time of ten days. No investigation-derived waste was generated during field activities.

Since the near-surface soils are the impacted media and some interim removal action of near-surface soils has been undertaken, groundwater was not analyzed as part of this investigation.

### 4 X-RAY FLUORESCENCE AND LABORATORY ANALYSIS

The soil analytical results obtained with the XRF are presented in Table 1 and are summarized below. The soil analytical results obtained with laboratory analysis are presented in Tables 2 and 3 and are summarized below. The detected values are compared with MTCA-A CUL for unrestricted land use. Where no criterion is established for MTCA-A for a parameter, MTCA Method B (MTCA-B) values are used. The toxicity equivalency factors (TEFs) for the cPAHs method has been developed to evaluate structurally related compounds, sharing a common mechanism of action. The TEF compounds are weighed and screened against values reported both within and between human health and ecological risk assessments.

### 4.1 X-Ray Fluorescence Results

Concentrations calculated with the XRF device were presented with a standard deviation. This deviation is variable between samples and can be seen in Table 1. Shannon & Wilson used the XRF to measure soil concentrations for arsenic, copper, and lead. The maximum contaminant concentration was calculated by taking the presented concentration in addition with standard deviation exceeded the relative MTCA-A and/or MTCA-B screening criteria. Samples recorded using the XRF with contaminant concentrations which exceeded the relevant MTCA criterion are shown below:

- Arsenic (concentrations were screened against the MTCA-A cleanup criteria of 20 mg/kg)
  - CR-24 (2 inches below ground surface [bgs]) Maximum concentration of 34 mg/kg
  - CR-36 (5 inches bgs) Maximum concentration of 29 mg/kg
  - CR-45 (surface) Maximum concentration of 32 mg/kg
  - **CR-47 (5 inches bgs)** Maximum concentration of 33 mg/kg
  - TP-3 (surface) Maximum concentration 26 mg/kg
  - TP-4 (1 foot bgs) Maximum concentration 29 mg/kg
  - **TP-5 (surface)** Maximum concentration 33 mg/kg
  - TP-6 (surface) Maximum concentration 332 mg/kg
  - **TP-6 (1 foot bgs)** Maximum concentration 112 mg/kg

- **TP-7 (surface)** Maximum concentration 279 mg/kg
- Lead (concentrations were screened against the MTCA-A cleanup criteria of 250 mg/kg)
  - CR-3 (6 inches bgs) Maximum concentration of 422 mg/kg
  - CR-24 (2 inches bgs) Maximum concentration of 259 mg/kg
  - **CR-37 (3 inches bgs)** Maximum concentration of 623 mg/kg
  - **CR-39 (surface)** Maximum concentration of 556 mg/kg
  - **CR-40 (3 inches bgs)** Maximum concentration of 410 mg/kg
  - CR-43 (surface) Maximum concentration of 274 mg/kg
  - CR-45 (surface) Maximum concentration of 554 mg/kg
  - CR-45 (3 inches bgs) Maximum concentration of 393 mg/kg
  - CR-46 (surface) Maximum concentration of 256 mg/kg
  - **CR-47 (5 inches bgs)** Maximum concentration of 293 mg/kg
  - **CR-48 (4 inches bgs)** Maximum concentration of 363 mg/kg

### 4.2 Analytical Laboratory Results

Select soil samples were submitted to Fremont Analytical for chemical analysis. Table 2 provides a summary of soil analytical results. Table 3 provides the TEF corrected cPAH values. The analytical laboratory reports are provided in Appendix A.

The detected values are compared with MTCA-A CUL for unrestricted land use. Where no criterion is established for MTCA-A for a parameter, MTCA-B values are used. The soil analytical results from laboratory analysis with detections above regulatory criteria are summarized below:

- Lead (concentrations were screened against the MTCA-A cleanup criteria of 250 mg/kg)
  - CR-24 (2 inches bgs) Concentration of 259 mg/kg
  - **CR-45 (surface)** Concentration of 554 mg/kg
  - **CR-45 (3 inches bgs)** Concentration of 393 mg/kg

The cPAHs are TEF weighted, screened against values reported both within and between human health and ecological risk assessments and are reported as a toxicity equivalent quotient.

- TEF Adjusted cPAH Concentrations
  - **CR-45 (surface)** Total carcinogenic cPAH toxic equivalence adjusted concentration of 0.65 mg/kg, exceeding screening criteria of 0.10 mg/kg.

Arsenic, copper, and zinc were not detected above their respective screening criteria in the select samples that were analyzed. Other PAHs were not detected in the select samples that were analyzed. Approximate sample locations and results can be seen in Figures 2 and 3.

### 5 FINDINGS, AND RECOMMENDATIONS

This ECR evaluates the evidence of contamination within the project site. Findings, and recommendations from the sampling and analysis (e.g., additional sampling to delineate the extent of contamination) in 2022 are as follows:

- Arsenic, lead and cPAHs in soil samples were detected in some samples at values that exceeded the MTCA CULs.
- Three areas of concern shown highlighted in Figure 3 should be removed as contaminated soil. We recommend a minimum of a 5-foot lateral distance from the known contaminated soil sample locations and a minimum 1-foot vertical limit of excavation. This soil should be taken offsite and disposed of at a Subtitle D licensed waste facility.
- Confirmation soil samples should be collected from the sidewalls and bottom of excavations after contaminated soil removal. Analytical testing of confirmation samples should include the analyte(s) with concentration exceedance(s), with respect to their location, to confirm if the extent of contamination has been removed. These contaminates include lead, arsenic, and cPAHs.
- Once confirmation chemical analysis results have demonstrated contaminant concentrations to be below their respective cleanup criterion, the Site can be re-graded to eliminate the excavation pits.

### 6 CLOSURE

Shannon & Wilson has prepared this document in a professional manner using that level of skill and care normally exercised for similar projects under similar conditions by reputable and competent environmental consultants currently practicing in the area.

Shannon & Wilson has prepared the enclosed "Important Information About Your Environmental Report" to assist you and others in understanding the use and limitations of our reports.

### Appendix A Laboratory Reports

### CONTENTS

- Fremont Analytical, Inc. Laboratory Report No. 2203269
- Fremont Analytical, Inc. Laboratory Report No. 2205114

# Important Information

About Your Environmental Report

# CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

### THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

### SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

### MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

### A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

### THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

# BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

### READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the GBA, Silver Spring, Maryland

### **SHANNON & WILSON**

#### Table 1: Summary of Soil XRF Results

Location:	CR-1		CR-1 CR-2		CF	₹-3	CF	<b> -</b> 4	CF	२-5	CF	<b> -</b> 6	CF	R-7	CF	२-8
Sample Depth <sup>(1)</sup> :	0	6	0	6	0	6	0	6	0	4	0	3	0	6	0	5
Metals																
Arsenic	6±5	ND	ND	ND	ND	ND	ND	6±5	5±5	ND	6±5	ND	ND	ND	ND	ND
Copper	29 ± 13	30 ± 19	40 ± 15	36 ± 17	17 ± 10	27 ± 15	20 ± 13	41 ± 15	33 ± 14	34 ± 16	43 ± 15	40 ± 17	29 ± 19	30 ± 16	28 ± 13	99 ± 26
Lead	20 ± 7	13 ± 9	10 ± 7	ND	11 ± 5	398 ± 24	16 ± 7	8 ± 7	18 ± 7	8 ± 7	12 ± 7	18 ± 8	19 ± 7	13 ± 8	17 ± 7	21 ± 10

Location:	CF	२-9	CR	-10	CR	-11	CR	-12	CR	-13	CR	-14	CR	-15	CR	-16
Sample Depth <sup>(1)</sup> :	0	3	0	3	0	4	0	6	0	4	0	4	0	6	0	3
Metals																
Arsenic	ND	6 ± 5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4 ± 4	ND	8 ± 6	ND
Copper	83 ± 20	111 ± 19	49 ± 15	46 ± 18	52 ± 15	373 ± 39	82 ± 18	35 ± 16	41 ± 13	35 ± 15	36 ± 14	39 ± 15	103 ± 16	35 ± 14	58 ± 16	43 ± 18
Lead	10 ± 7	ND	17 ± 7	38 ± 10	34 ± 8	40 ± 11	23 ± 9	19 ± 8	9±5	ND	10 ± 6	19 ± 8	8 ± 5	ND	22 ± 7	63 ± 12

Location:	CR-17	CR	-18	CR	-19	CR	-20	CR	-21	CR	-22	CR	-23	CR	-24
Sample Depth <sup>(1)</sup> :	0	0	2	0	2	0	6	0	4	0	2	0	2	0	2
Metals															
Arsenic	8 ± 6	ND	7 ± 6	ND	ND	ND	20 ± 14								
Copper	84 ± 17	45 ± 13	39 ± 16	39 ± 12	39 ± 16	21 ± 10	44 ± 19	25 ± 12	98 ± 27	55 ± 23	76 ± 20	39 ± 14	51 ± 20	57 ± 16	82 ± 20
Lead	30 ± 9	24 ± 7	15 ± 7	22 ± 6	9±7	26 ± 6	16 ± 9	9 ± 6	22 ± 11	ND	10 ± 8	17 ± 7	24 ± 10	45 ± 9	239 ± 20

Location:	CR	-25	CR	-26	CR	-27	CR	-28	CR	-29	CR	-30	CR	-31	CR	-32
Sample Depth <sup>(1)</sup> :	0	5	0	5	0	6	0	6	0	6	0	3	0	2	0	2
Metals																
Arsenic	ND	10 ± 8	D	5±5	ND	6 ± 6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Copper	44 ± 18	52 ± 22	24 ± 17	24 ± 15	41 ± 15	44 ± 14	33 ± 13	60 ± 15	29 ± 19	37 ± 15	32 ± 17	47 ± 19	53 ± 21	48 ± 17	37 ± 14	60 ± 20
Lead	44 ± 10	23 ± 10	26 ± 9	9±7	44 ± 9	36 ± 8	102 ± 11	224 ± 16	55 ± 12	9 ± 7	77 ± 12	118 ± 16	34 ± 11	10 ± 7	20 ± 14	65 ± 12

Location:	CR	-33	CR-34		CR-35		CR	-36	CR	-37	CR	-38	CR	-39	CR	-40
Sample Depth <sup>(1)</sup> :	0	3	0	6	0	6	0	5	0	3	0	6	0	3	0	3
Metals																
Arsenic	ND	ND	ND	6 ± 5	ND	ND	ND	10 ± 19	ND	ND	ND	ND	ND	ND	ND	ND
Copper	30 ± 14	84 ± 19	51 ± 27	33 ± 15	ND	78 ± 19	56 ± 18	67 ± 23	57 ± 18	93 ± 17	43 ± 14	95 ± 21	50 ± 21	49 ± 17	35 ± 15	260 ± 37
Lead	17 ± 7	74 ± 11	15 ± 12	ND	30 ± 14	ND	107 ± 13	41 ± 12	164 ± 17	597 ± 26	80 ± 10	96 ± 13	522 ± 34	190 ± 17	50 ± 10	379 ± 31

Location:	CR	-41	CR-42		CR-43		CR	-44	CR	-45	CR	-46	CR	-47	CR	-48
Sample Depth <sup>(1)</sup> :	0	5	0	3	0	4	0	3	0	3	0	4	0	5	0	4
Metals																
Arsenic	13 ± 7	ND	ND	6±5	ND	ND	ND	ND	16 ± 16	ND	ND	ND	ND	19 ± 14	8 ± 7	ND
Copper	28 ± 16	54 ± 16	26 ± 16	28 ± 14	47 ± 28	38 ± 17	40 ± 15	ND	49 ± 13	50 ± 17	49 ± 18	61 ± 27	46 ± 17	39 ± 15	50 ± 2	52 ± 20
Lead	21 ± 8	62 ± 10	14 ± 8	15 ± 7	242 ± 32	17 ± 8	192 ± 16	90 ± 25	529 ± 25	376 ± 17	236 ± 20	228 ± 21	211 ± 19	274 ± 19	203 ± 11	337 ± 26

NOTES:

(1) Indicates soil sample depth in approximate inches below ground surface.

Highlighted indicates analyte was detected at or above the established cleanup level.

MTCA-A = Washington Model Toxics Control Act Method A; ND = analyte not detected above the XRF reporting limits; NE = not established for this analyte; XRF = X-ray fluorescence

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#### Table 1: Summary of Soil XRF Results (Continued)

Location:	CR	-49	CF	R-50	CR	-51	CR	-52	CR	-53	CR	-54	CR	-55		CR-56	
Sample Depth <sup>(1)</sup> :	0	6	0	4	1	4	0	3	0	3	0	3	0	3	0	3	5
Metals																	
Arsenic	5±5	ND	4 ± 3	6 ± 3	ND	ND	3 ± 3	ND	ND	ND	ND	ND	ND	ND	7 ± 5	8 ± 5	8 ± 7
Copper	31 ± 14	31 ± 19	18 ± 9	37 ± 9	17 ± 7	16 ± 7	30 ± 8	21 ± 7	34 ± 12	33 ± 12	30 ± 8	31 ± 11	19 ± 11	17 ± 8	32 ± 8	35 ± 9	32 ± 11
Lead	9±7	9 ± 9	ND	21 ± 4	7 ± 3	ND	4 ± 4	ND	5 ± 4	ND	56 ± 5	47 ± 7	10 ± 5	ND	76 ± 6	98 ± 7	86 ± 9

Location:	CR	-57	CR	-58	CR	-59	CR	-60	CR	-61	CR	-62		TP	-1	
Sample Depth <sup>(1)</sup> :	0	4	1	4	1	5	0	3	0	3	0	3	0	6 inches	2 feet	4 feet
Metals																
Arsenic	ND	ND	ND	9 ± 7	7 ± 5	6 ± 5	6 ± 2	4 ± 3	8 ± 4	ND	6 ± 4	6 ± 5	ND	10 ± 6	ND	ND
Copper	32 ± 13	34 ± 14	30 ± 7	30 ± 13	28 ± 7	42 ± 10	17 ± 6	18 ± 5	32 ± 8	157 ± 37	38 ± 9	30 ± 11	21 ± 7	34 ± 12	33 ± 12	30 ± 8
Lead	54 ± 8	44 ± 8	84 ± 6	65 ± 7	179 ± 8	76 ± 7	24 ± 4	11 ± 4	72 ± 6	75 ± 6	8 ± 6	9 ± 6	11 ± 4	7 ± 3	ND	5 ± 4

Location:		TP-2			TP-3			TP-4			TP-5			TP-6	
Sample Depth <sup>(1)</sup> :	0	1 foot	5 feet	0	1.5 feet	3 feet	0	1 foot	3 feet	0	1 foot	3.5 feet	0	1 foot	3 feet
Metals															
Arsenic	ND	6 ± 4	ND	21 ± 5	ND	ND	13 ± 5	22 ± 7	ND	35 ± 8	ND	ND	307 ± 25	98 ± 14	ND
Copper	31 ± 11	19 ± 11	17 ± 8	32 ± 8	35 ± 9	32 ± 11	32 ± 13	34 ± 14	30 ± 7	30 ± 13	28 ± 7	32 ± 11	32 ± 13	34 ± 14	30 ± 7
Lead	20 ± 6	59 ± 6	ND	156 ± 5	ND	ND	ND	ND	ND	56 ± 7	ND	ND	37 ± 6	ND	ND

Location:		TP-7		MTCA-A	MTCA-B				
Sample Depth <sup>(1)</sup> :	0	1.5 feet	Levels	Levels					
Metals									
Arsenic	256 ± 23	ND	ND	20	24				
Copper	30 ± 13	28 ± 7	28 ± 7	NE	3,200				
Lead	168 ± 17	ND	ND	250	NE				

NOTES:

(1) Indicates soil sample depth in approximate inches below ground surface.

Highlighted indicates analyte was detected at or above the established cleanup level.

MTCA-A = Washington Model Toxics Control Act Method A; ND = analyte not detected above the XRF reporting limits; NE = not established for this analyte; XRF = X-ray fluorescence

### **Table 2: Summary of Soil Laboratory Results**

Location:	C	CR-3	CR	2-24	CR	-45	CR-56	CR-59	CR-61	MTCA-A	MTCA-B
Sample Depth <sup>(1)</sup> :	0	6	0	2	0	3	3	1	3	Cleanup Levels	Cleanup Levels
Polyaromatic Hydrocarbons (PAHs) - mg/kg											
Phenanthrene	ND		ND		0.0998				ND	NE	NE
Fluoranthene	ND		ND		0.139				ND	NE	3,200
Pyrene	ND		0.0453		0.395				ND	NE	2,400
Benzo(a)anthracene	ND		0.0333		0.326				0.0347	NE	NE
Chrysene	ND		0.0475		0.515				0.0470	NE	NE
Benzo(b)fluoranthene	ND		0.0448		0.301				0.0384	NE	NE
Benzo(k)fluoranthene	ND		ND		0.0906				ND	NE	NE
Benzo(a)pyrene	ND		0.0496		0.555				0.0445	0.1	24
Indeno(1,2,3-cd)pyrene	ND		ND		0.111				ND	NE	NE
Dibenz(a,h)anthracene	ND		ND		0.0685				ND	NE	NE
Benzo(g,h,i)perylene	ND		0.0322		0.302				0.0236	NE	NE
All other PAHs	ND		ND		ND				ND	NA	NA
Metals - mg/kg											
Arsenic	2.98	2.73	2.70	3.47	4.17	3.67	3.12	3.99	4.25	20	24
Copper	19.2	14.7	549	51.5	37.6	31.8	24.2	23.2	24.5	NE	3,200
Lead	12.6	8.69	27.4	264	449	337	114	147	41.4	250	NE
Zinc	66.2	63.0	59.1	73.5	49.6	41.9				NE	400

NOTES:

(1) Indicates soil sample depth in approximate inches below ground surface.

Highlighted cells indicates analyte was detected at or above the established cleanup level.

Bold text indicates analyte was detected at or above the laboratory reporting limit.

-- = analyte not analyzed MTCA-A = Washington Model Toxics Control Act Method A; MTCA-B = Washington Model Toxics Control Act Method B; mg/kg = milligrams per kilogram; ND = analyte not detected above laboratory reporting limits; NE = not established for this analyte

### Table 3: Toxicity Equivalency Factor Adjusted Polycyclic Aromatic Hydrocarbon Concentrations

	Total cPAH TEQ Calculation for Sample CR-24 at 0 inch bgs									
Analyte	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	Adjusted Concentration <sup>1</sup> (mg/kg)						
benzo(a)pyrene	0.0496	0.0211	1	0.0496						
benzo(a)anthracene	0.0333	0.0211	0.1	0.00333						
benzo(b)fluoranthene	0.0448	0.0211	0.1	0.00448						
benzo(k)fluoranthene	ND	0.0211	0.1	0.001055						
chrysene	0.0475	0.0422	0.01	0.000475						
dibenzo[a,h]anthracene	ND	0.0211	0.1	0.001055						
indeno[1,2,3-cd]pyrene	ND	0.0422	0.1	0.00211						
Total cPAH TEQ <sup>2</sup>				0.062						
MTCA Method A Cleanup Lev	el for Unrestricted I an	d Use		0 10						

Total cPAH TEQ Calculation for Sample CR-45 at 0 inch bgs										
Analyte	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	Adjusted Concentration <sup>1</sup> (mg/kg)						
benzo(a)pyrene	0.555	0.0224	1	0.555						
benzo(a)anthracene	0.326	0.0224	0.1	0.0326						
benzo(b)fluoranthene	0.301	0.0224	0.1	0.0301						
benzo(k)fluoranthene	0.0906	0.0224	0.1	0.00906						
chrysene	0.515	0.0448	0.01	0.00515						
dibenzo[a,h]anthracene	0.0685	0.0448	0.1	0.00685						
indeno[1,2,3-cd]pyrene	0.111	0.0448	0.1	0.0111						
Total cPAH TEQ <sup>2</sup>				0.650						
MTCA Method A Cleanup Leve	0.10									

#### Table 3: TEF Adjusted PAH Concenctrations (Continued)

	Total cPAH 1	Total cPAH TEQ Calculation for Sample CR-45 at 0 inch bgs									
Analyte	Result (mg/kg)	Method Detection Limit (mg/kg)	Toxicity Equivalency Factor	Adjusted Concentration <sup>1</sup> (mg/kg)							
benzo(a)pyrene	0.0445	0.0217	1	0.0445							
benzo(a)anthracene	0.0347	0.0217	0.1	0.00347							
benzo(b)fluoranthene	0.0384	0.0217	0.1	0.00384							
benzo(k)fluoranthene	ND	0.0217	0.1	0.001085							
chrysene	0.0470	0.0434	0.01	0.00047							
dibenzo[a,h]anthracene	ND	0.0434	0.1	0.00217							
indeno[1,2,3-cd]pyrene	ND	0.0434	0.1	0.00217							
Total cPAH TEQ <sup>2</sup>				0.058							
MTCA Method A Cleanup Lev	el for Unrestricted La	ind Use		0.10							

NOTES:

1 For detected compounds, calculated as the detected concentration multiplied by the compound's TEF. For compounds that are ND, calculated as onehalf of the MDL multiplied by the compound's TEF.

2 Sum of the TEF adjusted concentration for each cPAH.

Shaded text indicates a concentration exceeding the MTCA cleanup level.

bgs = below ground surface; cPAH = carcinogenic polycyclic aromatic hydrocarbon; MDL = Method Detection Limit; mg/kg = milligrams per kilogram;

MTCA = Model Toxics Control Act; ND = not detected above the MDL; TEF = toxicity equivalent factor; TEQ = toxicity equivalent quotient







### Appendix A Laboratory Reports

### CONTENTS

- Fremont Analytical, Inc. Laboratory Report No. 2203269
- Fremont Analytical, Inc. Laboratory Report No. 2205114



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

Shannon & Wilson Christian Canfield 400 N. 34th Street, Suite 100 Seattle, WA 98103

RE: DNR - Cassidy Road Work Order Number: 2203269

March 17, 2022

#### **Attention Christian Canfield:**

Fremont Analytical, Inc. received 6 sample(s) on 3/10/2022 for the analyses presented in the following report.

#### Polyaromatic Hydrocarbons by EPA Method 8270 (SIM) Sample Moisture (Percent Moisture) Total Metals by EPA Method 6020B

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



CLIENT: Project: Work Order:	Shannon & Wilson DNR - Cassidy Road 2203269	Work Order Sample Summary						
Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received					
2203269-001	CR-3:0	03/10/2022 12:00 PM	03/10/2022 4:47 PM					
2203269-002	CR-45:3	03/10/2022 12:20 PM	03/10/2022 4:47 PM					
2203269-003	CR-24:0	03/10/2022 12:40 PM	03/10/2022 4:47 PM					
2203269-004	CR-45:0	03/10/2022 12:30 PM	03/10/2022 4:47 PM					
2203269-005	CR-24:2	03/10/2022 12:50 PM	03/10/2022 4:47 PM					
2203269-006	CR-3:6	03/10/2022 12:10 PM	03/10/2022 4:47 PM					



**Case Narrative** 

WO#: **2203269** Date: **3/17/2022** 

CLIENT:Shannon & WilsonProject:DNR - Cassidy Road

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 & Acronyms**



WO#: **2203269** Date Reported: **3/17/2022** 

#### Qualifiers:

- \* Flagged value is not within established 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 Reporting Limit
- R High relative percent difference observed

Acronyms:

%Rec - Percent Recoverv 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



Client: Shannon & Wilson Collection Date: 3/10/202					te: 3/10/2022 12:00:00 PM	
Project: DNR - Cassidy Road						
<b>I ab ID:</b> 2203269-001				Matrix: Sc	il	
Client Semple ID: CB 2:0					/11	
Client Sample ID: CR-3:0						
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA	A Method 8	<u>270 (SIM)</u>		Batch	ID:	35684 Analyst: IH
Naphthalene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
2-Methylnaphthalene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
1-Methylnaphthalene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Acenaphthylene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Acenaphthene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Fluorene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Phenanthrene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Anthracene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Fluoranthene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Pyrene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Benz(a)anthracene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Chrysene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Benzo(b)fluoranthene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Benzo(k)fluoranthene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Benzo(a)pyrene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Indeno(1,2,3-cd)pyrene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Dibenz(a,h)anthracene	ND	62.5		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Benzo(g,h,i)perylene	ND	31.2		µg/Kg-dry	1	3/12/2022 12:24:11 AM
Surr: 2-Fluorobiphenyl	78.1	29.6 - 130		%Rec	1	3/12/2022 12:24:11 AM
Surr: Terphenyl-d14 (surr)	81.7	38 - 145		%Rec	1	3/12/2022 12:24:11 AM
Total Metals by EPA Method 6020B				Batch	ID:	35721 Analyst: EH
Arsenic	2.98	0.152		mg/Kg-dry	1	3/15/2022 4:12:55 PM
Copper	19.2	1.27		mg/Kg-dry	1	3/15/2022 4:12:55 PM
Lead	12.6	0.253		mg/Kg-dry	1	3/15/2022 4:12:55 PM
Zinc	66.2	2.22		mg/Kg-dry	1	3/15/2022 4:12:55 PM
Sample Moisture (Percent Moisture	)			Batch	ID:	R73909 Analyst: KJ
Percent Moisture	36.8	0.500		wt%	1	3/11/2022 10:55:41 AM



Client: Shannon & Wilson	Collection Date: 3/10/2022 12:20:00 F					
Project: DNR - Cassidy Road						
Lab ID: 2203269-002				Matrix: Sc	oil	
Client Sample ID: CR-45:3						
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Total Metals by EPA Method 6020B				Batch	ID: 35	721 Analyst: EH
Arsenic	3.67	0.108		mg/Kg-dry	1	3/15/2022 4:15:39 PM
Copper	31.8	0.896		mg/Kg-dry	1	3/15/2022 4:15:39 PM
Lead	337	1.79	D	mg/Kg-dry	10	3/17/2022 12:56:07 PM
Zinc	41.9	1.57		mg/Kg-dry	1	3/15/2022 4:15:39 PM
Sample Moisture (Percent Moisture	<u>e)</u>			Batch	ID: R7	4043 Analyst: MCH
Percent Moisture	12.8	0.500		wt%	1	3/16/2022 3:05:30 PM



Client: Shannon & Wilson Collection Date: 3/10/2022 12:40:0						e: 3/10/2022 12:40:00 PM
Project: DNR - Cassidy Road						
<b>I ab ID:</b> 2203269-003				Matrix: Sc	sil	
Client Semple ID: CD 24:0					///	
Client Sample ID: CR-24:0	_		_		_	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
Polyaromatic Hydrocarbons by EPA	Method 8	<u>270 (SIM)</u>		Batch	n ID:	35684 Analyst: IH
Naphthalene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
2-Methylnaphthalene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
1-Methylnaphthalene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Acenaphthylene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Acenaphthene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Fluorene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Phenanthrene	ND	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Anthracene	ND	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Fluoranthene	ND	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Pyrene	45.3	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Benz(a)anthracene	33.3	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Chrysene	47.5	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Benzo(b)fluoranthene	44.8	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Benzo(k)fluoranthene	ND	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Benzo(a)pyrene	49.6	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Indeno(1,2,3-cd)pyrene	ND	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Dibenz(a,h)anthracene	ND	42.2		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Benzo(g,h,i)perylene	32.2	21.1		µg/Kg-dry	1	3/12/2022 12:51:56 AM
Surr: 2-Fluorobiphenyl	87.9	29.6 - 130		%Rec	1	3/12/2022 12:51:56 AM
Surr: Terphenyl-d14 (surr)	93.5	38 - 145		%Rec	1	3/12/2022 12:51:56 AM
Total Metals by EPA Method 6020B				Batch	n ID:	35721 Analyst: EH
Arsenic	2.70	0.103		mg/Kg-dry	1	3/15/2022 4:18:23 PM
Copper	549	8.59	D	mg/Kg-dry	10	3/17/2022 12:58:52 PM
Lead	27.4	0.172		ma/Ka-drv	1	3/15/2022 4:18:23 PM
Zinc	59.1	1.50		mg/Kg-dry	1	3/15/2022 4:18:23 PM
Sample Moisture (Percent Moisture)	1			Batch	n ID:	R73909 Analyst: KJ
Percent Moisture	8.37	0.500		wt%	1	3/11/2022 10:55:41 AM



Client: Shannon & Wilson		Collection Date: 3/10/2022 12:30:00 PM				
Project: DNR - Cassidy Road						
<b>I ab ID:</b> 2203269-004				Matrix: Sc	sil	
Client Sample ID: CR-45:0	_				_	
Analyses	Result	RL	Qual	Units	DF	Date Analyzed
				-		
Polyaromatic Hydrocarbons by EPA	<u>A Method 8</u>	<u>270 (SIM)</u>		Batch	ו ID: 3	35684 Analyst: IH
Naphthalene	ND	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
2-Methylnaphthalene	ND	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
1-Methylnaphthalene	ND	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Acenaphthylene	ND	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Acenaphthene	ND	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Fluorene	ND	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Phenanthrene	99.8	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Anthracene	ND	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Fluoranthene	139	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Pyrene	395	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Benz(a)anthracene	326	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Chrysene	515	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Benzo(b)fluoranthene	301	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Benzo(k)fluoranthene	90.6	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Benzo(a)pyrene	555	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Indeno(1,2,3-cd)pyrene	111	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Dibenz(a,h)anthracene	68.5	44.8		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Benzo(g,h,i)perylene	302	22.4		µg/Kg-dry	1	3/12/2022 1:19:38 AM
Surr: 2-Fluorobiphenyl	86.8	29.6 - 130		%Rec	1	3/12/2022 1:19:38 AM
Surr: Terphenyl-d14 (surr)	89.3	38 - 145		%Rec	1	3/12/2022 1:19:38 AM
Total Metals by EPA Method 6020B				Batch	n ID: 3	35721 Analyst: EH
Arsenic	4.17	0.108		mg/Kg-dry	1	3/15/2022 4:26:36 PM
Copper	37.6	0.899		mg/Kg-dry	1	3/15/2022 4:26:36 PM
Lead	449	1.80	D	mg/Kg-dry	10	3/17/2022 1:01:36 PM
Zinc	49.6	1.57		mg/Kg-dry	1	3/15/2022 4:26:36 PM
Sample Moisture (Percent Moisture	<u>e)</u>			Batch	n ID: F	R73909 Analyst: KJ
Percent Moisture	12.4	0.500		wt%	1	3/11/2022 10:55:41 AM



Client: Shannor	n & Wilson	Collection Date: 3/10/2022 12:5					
Project: DNR - C	assidy Road						
Lab ID: 2203269	9-005				Matrix: Sc	oil	
Client Sample ID	: CR-24:2						
Analyses		Result	RL	Qual	Units	DF	Date Analyzed
Total Metals by	EPA Method 6020B	<u>.</u>			Batch	ID: 35	721 Analyst: EH
Arsenic		3.47	0.0969		mg/Kg-dry	1	3/15/2022 4:29:20 PM
Copper		51.5	0.807		mg/Kg-dry	1	3/15/2022 4:29:20 PM
Lead		264	1.61	D	mg/Kg-dry	10	3/17/2022 1:04:20 PM
Zinc		73.5	1.41		mg/Kg-dry	1	3/15/2022 4:29:20 PM
Sample Moisture	e (Percent Moisture	<u>e)</u>			Batch	ID: R7	4043 Analyst: MCH
Percent Moisture		6.88	0.500		wt%	1	3/16/2022 3:05:30 PM



Client:	Shannon & Wilson				Collection	Da	te: 3/10/20	22 12:10:00 PN	l
Project:	DNR - Cassidy Road								
Lab ID:	2203269-006				Matrix: Sc	il			
Client Sa	ample ID: CR-3:6								
Analyse	S	Result	RL	Qual	Units	DF	= Da	te Analyzed	
Total M	etals by EPA Method 6020	B			Batch	ID:	35721	Analyst: EH	
Arsenic		2.73	0.114		mg/Kg-dry	1	3/15/	2022 4:32:04 PM	
Copper		14.7	0.952		mg/Kg-dry	1	3/15/	2022 4:32:04 PM	
Lead		8.69	0.190		mg/Kg-dry	1	3/15/	2022 4:32:04 PM	
Zinc		63.0	1.67		mg/Kg-dry	1	3/15/	2022 4:32:04 PM	
<u>Sample</u>	Moisture (Percent Moistu	<u>re)</u>			Batch	ID:	R74043	Analyst: MCH	
Percent	Moisture	16.7	0.500		wt%	1	3/16/	2022 3:05:30 PM	

h		And	alytical											
Work Or	der:	2203269									QC S	SUMMAI	RY REF	PORT
CLIENT:		Shannon & V	Vilson								Total Meta	als by FPA	Method	6020B
Project:		DNR - Cassi	dy Road										Method	00200
Sample ID:	MB-35	721	SampType:	MBLK			Units: mg/Kg		Prep Da	te: 3/15/20	)22	RunNo: 739	996	
Client ID:	MBLK	6	Batch ID:	35721					Analysis Da	te: 3/15/20	)22	SeqNo: 151	16275	
Analyte			Re	sult	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic				ND	0.0938									
Copper				ND	0.781									
Lead				ND	0.156									
Zinc				ND	1.37									
Sample ID:	LCS-35	5721	SampType:	LCS			Units: mg/Kg		Prep Da	te: 3/15/20	)22	RunNo: 739	996	
Client ID:	LCSS		Batch ID:	35721					Analysis Da	te: 3/15/20	)22	SeqNo: 151	16276	
Analyte			Re	sult	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic			3	37.8	0.0960	40.00	0	94.6	80	120				
Copper			3	38.8	0.800	40.00	0	97.1	80	120				
Lead			1	19.8	0.160	20.00	0	98.9	80	120				
Zinc			3	38.1	1.40	40.00	0	95.2	80	120				
Sample ID:	220329	7-002AMS	SampType:	MS			Units: mg/Kg-	dry	Prep Da	te: 3/15/20	)22	RunNo: 739	996	
Client ID:	BATCH	1	Batch ID:	35721					Analysis Da	te: 3/15/20	)22	SeqNo: 151	16279	
Analyte			Re	sult	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic			2	14.0	0.0987	41.13	3.606	98.3	75	125				
Copper			6	67.6	0.823	41.13	88.33	-50.3	75	125				S
Lead			2	20.9	0.165	20.57	2.259	90.7	75	125				
Zinc			8	32.9	1.44	41.13	57.04	62.9	75	125				S
NOTES: S - Outly	/ing spik	e recovery(ies) o	bserved. A dupl	licate ana	lysis was pe	erformed with s	similar results indicati	ing a pos	sible matrix e	effect.				
Sample ID:	220329	7-002AMSD	SampType:	MSD			Units: mg/Kq-	dry	Prep Da	te: 3/15/20	)22	RunNo: 739	996	
Client ID:	BATCH	1	Batch ID:	35721			5.5		Analysis Da	te: 3/15/20	)22	SeqNo: 151	16280	
Analyte			Re	sult	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual

38.98

3.606

75

125

44.05

97.0

20

6.18





Work Order: CLIENT: Project:	2203269 Shannon & DNR - Cass	Wilson sidy Road								QC S	SUMMA als by EPA	RY REF	ORT 6020B
Sample ID: 22032	97-002AMSD	SampTyp	e: MSD			Units: mg	′Kg-dry	Prep Da	te: 3/15/20	22	RunNo: 73	996	
Client ID: BATC	Н	Batch ID:	35721					Analysis Da	te: 3/15/20	22	SeqNo: 15	16280	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper			67.5	0.780	38.98	88.33	-53.6	75	125	67.64	0.285	20	S
Lead			20.1	0.156	19.49	2.259	91.6	75	125	20.92	3.94	20	
Zinc			78.5	1.36	38.98	57.04	55.1	75	125	82.92	5.44	20	S
<b>NOTES:</b> S - Outlying spi	ke recovery(ies)	observed. A o	duplicate ana	lysis was pe	erformed with s	similar results inc	licating a poss	sible matrix e	effect.				

Sample ID: 2203297-002APDS	SampType: PDS			Units: mg	′Kg-dry	Prep Da	te: 3/15/20	22	RunNo: 739	96	
Client ID: BATCH	Batch ID: 35721					Analysis Da	te: 3/15/20	22	SeqNo: 151	6281	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Copper	131	0.823	41.1	88.3	103	75	125				
Zinc	99.8	1.44	41.1	57.0	104	75	125				



Fremont
Analytical

Work Order: 2203	3269							2.00	SUMMAR	RY REF	PORT
CLIENT: Shar	nnon & Wilson				-						
Project: DNR	- Cassidy Road				PC	olyaroma	tic Hydro	carbons b	y EPA Met	hod 827	D (SIM)
Sample ID: MB-35684	SampType: <b>MBLK</b>			Units: µg/Kg		Prep Da	te: 3/11/202	22	RunNo: 739	92	
Client ID: MBLKS	Batch ID: 35684					Analysis Da	te: 3/11/202	22	SeqNo: 151	6125	
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									
Acenaphthylene	ND	20.0									
Acenaphthene	ND	20.0									
Fluorene	ND	20.0									
Phenanthrene	ND	40.0									
Anthracene	ND	40.0									
Fluoranthene	ND	40.0									
Pyrene	ND	40.0									
Benz(a)anthracene	ND	20.0									
Chrysene	ND	40.0									
Benzo(b)fluoranthene	ND	20.0									
Benzo(k)fluoranthene	ND	20.0									
Benzo(a)pyrene	ND	20.0									
Indeno(1,2,3-cd)pyrene	ND	40.0									
Dibenz(a,h)anthracene	ND	40.0									
Benzo(g,h,i)perylene	ND	20.0									
Surr: 2-Fluorobiphenyl	1,030		1,000		103	29.6	130				
Surr: Terphenyl-d14 (su	ırr) 1,120		1,000		112	38	145				
Sample ID: LCS-35684	SampType: LCS			Units: µg/Kg		Prep Da	te: 3/11/202	22	RunNo: 739	92	
Client ID: LCSS	Batch ID: 35684					Analysis Da	te: 3/11/202	22	SeqNo: 151	6126	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,880	20.0	2,000	0	94.0	60.2	119				
2-Methylnaphthalene	1,840	20.0	2,000	0	92.2	60.4	121				
1-Methylnaphthalene	1,810	20.0	2,000	0	90.5	62	119				
Acenaphthylene	1,760	20.0	2,000	0	87.9	58.5	120				
Acenaphthene	1,910	20.0	2,000	0	95.7	57.8	117				



1,740

1,660

1,100

1,120

40.0

20.0

2,000

2,000

1,000

1,000

Work Order: 2203	269							00 9	SUMMA		
CLIENT: Shar	non & Wilson				_	_					
Project: DNR	- Cassidy Road				Ро	lyaromat	tic Hydro	ocarbons b	y EPA Met	thod 827	0 (SIM)
Sample ID: LCS-35684	SampType: LCS			Units: µg/Kg		Prep Dat	te: 3/11/20	22	RunNo: 739	992	
Client ID: LCSS	Batch ID: 35684					Analysis Da	te: 3/11/20	22	SeqNo: 151	6126	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	1,930	20.0	2,000	0	96.4	60.3	122				
Phenanthrene	1,860	40.0	2,000	0	93.0	58.6	120				
Anthracene	1,850	40.0	2,000	0	92.4	58.1	122				
Fluoranthene	1,880	40.0	2,000	0	94.2	61.8	123				
Pyrene	1,850	40.0	2,000	0	92.4	59.8	122				
Benz(a)anthracene	1,890	20.0	2,000	0	94.5	62.7	123				
Chrysene	1,880	40.0	2,000	0	93.8	56.2	123				
Benzo(b)fluoranthene	1,990	20.0	2,000	0	99.6	56.6	126				
Benzo(k)fluoranthene	1,910	20.0	2,000	0	95.4	56.9	131				
Benzo(a)pyrene	1,800	20.0	2,000	0	90.1	63.8	134				
Indeno(1,2,3-cd)pyrene	1,760	40.0	2,000	0	88.0	59.3	122				

Sample ID: 2203230-002AMS	SampType: <b>MS</b>			Units: µg/K	g-dry	Prep Da	te: 3/11/20	22	RunNo: 73	992	
Client ID: BATCH	Batch ID: 35684					Analysis Da	te: 3/11/20	22	SeqNo: 15	6129	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,640	20.5	2,049	0	80.3	30.2	123				
2-Methylnaphthalene	1,600	20.5	2,049	0	78.1	40.9	115				
1-Methylnaphthalene	1,570	20.5	2,049	0	76.9	35.6	121				
Acenaphthylene	1,520	20.5	2,049	0	74.0	37.6	117				
Acenaphthene	1,650	20.5	2,049	0	80.7	35.6	115				
Fluorene	1,650	20.5	2,049	0	80.4	38.8	119				
Phenanthrene	1,610	41.0	2,049	0	78.7	32.8	120				
Anthracene	1,590	41.0	2,049	0	77.6	33.7	122				
Fluoranthene	1,630	41.0	2,049	0	79.5	37.5	124				
Pyrene	1,600	41.0	2,049	0	77.9	34	122				

0

0

86.9

83.0

110

112

60.4

52.7

29.6

38

125

126

130

145

Dibenz(a,h)anthracene

Surr: 2-Fluorobiphenyl

Surr: Terphenyl-d14 (surr)

Benzo(g,h,i)perylene



#### Work Order: 2203269

CLIENT: Shannon & Wilson

### QC SUMMARY REPORT

Project: DNR - Cassidy Road

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

Sample ID: 2203230-002AMS	SampType: <b>MS</b>			Units: µg/k	(g-dry	Prep Da	te: 3/11/20	22	RunNo: 739	92	
Client ID: BATCH	Batch ID: 35684					Analysis Da	te: 3/11/20	22	SeqNo: 151	6129	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	1,630	20.5	2,049	4.394	79.1	34.7	127				
Chrysene	1,620	41.0	2,049	0	79.0	33.4	120				
Benzo(b)fluoranthene	1,680	20.5	2,049	0	81.9	31.8	125				
Benzo(k)fluoranthene	1,570	20.5	2,049	0	76.8	30.2	129				
Benzo(a)pyrene	1,530	20.5	2,049	6.838	74.6	31.3	139				
Indeno(1,2,3-cd)pyrene	1,510	41.0	2,049	0	73.5	22.8	126				
Dibenz(a,h)anthracene	1,480	41.0	2,049	0	72.4	28.1	127				
Benzo(g,h,i)perylene	1,410	20.5	2,049	0	68.9	18.7	125				
Surr: 2-Fluorobiphenyl	964		1,024		94.1	29.6	130				
Surr: Terphenyl-d14 (surr)	977		1,024		95.3	38	145				

Sample ID: 2203230-002AMSD	SampType: <b>MSD</b>			Units: µg/K	g-dry	Prep Dat	e: <b>3/11/20</b>	22	RunNo: 739	992	
Client ID: BATCH	Batch ID: 35684					Analysis Dat	ie: <b>3/11/20</b>	22	SeqNo: 151	6130	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,540	21.1	2,108	0	72.8	30.2	123	1,645	6.88	30	
2-Methylnaphthalene	1,500	21.1	2,108	0	71.0	40.9	115	1,600	6.60	30	
1-Methylnaphthalene	1,470	21.1	2,108	0	69.9	35.6	121	1,575	6.65	30	
Acenaphthylene	1,410	21.1	2,108	0	67.0	37.6	117	1,517	7.12	30	
Acenaphthene	1,560	21.1	2,108	0	73.8	35.6	115	1,653	6.03	30	
Fluorene	1,560	21.1	2,108	0	73.9	38.8	119	1,648	5.63	30	
Phenanthrene	1,490	42.2	2,108	0	70.9	32.8	120	1,612	7.55	30	
Anthracene	1,480	42.2	2,108	0	70.3	33.7	122	1,590	7.10	30	
Fluoranthene	1,520	42.2	2,108	0	72.0	37.5	124	1,629	7.05	30	
Pyrene	1,480	42.2	2,108	0	70.3	34	122	1,596	7.45	30	
Benz(a)anthracene	1,510	21.1	2,108	4.394	71.5	34.7	127	1,625	7.31	30	
Chrysene	1,500	42.2	2,108	0	71.3	33.4	120	1,617	7.37	30	
Benzo(b)fluoranthene	1,560	21.1	2,108	0	73.8	31.8	125	1,677	7.51	30	
Benzo(k)fluoranthene	1,550	21.1	2,108	0	73.7	30.2	129	1,574	1.23	30	
Benzo(a)pyrene	1,440	21.1	2,108	6.838	68.2	31.3	139	1,535	6.06	30	



#### Work Order: 2203269

CLIENT: Shannon & Wilson

### DNR - Cassidy Road

### **QC SUMMARY REPORT**

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

Project: DNR	- Cassidy Road					PC	oryaromat	ic Hydro	ocarbons d	y EPA Met		) (SINI)
Sample ID: 2203230-002A	MSD SampType	e: MSD			Units: µg/	Kg-dry	Prep Dat	e: <b>3/11/20</b>	22	RunNo: 739	92	
Client ID: BATCH	Batch ID:	35684					Analysis Dat	e: <b>3/11/20</b>	22	SeqNo: 151	6130	
Analyte	I	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene		1,380	42.2	2,108	0	65.4	22.8	126	1,507	8.92	30	
Dibenz(a,h)anthracene		1,370	42.2	2,108	0	64.9	28.1	127	1,482	7.98	30	
Benzo(g,h,i)perylene		1,280	21.1	2,108	0	60.6	18.7	125	1,412	10.1	30	
Surr: 2-Fluorobiphenyl		908		1,054		86.2	29.6	130		0		
Surr: Terphenyl-d14 (sur	rr)	898		1,054		85.2	38	145		0		



### Sample Log-In Check List

Client Name: SW		Work Ord	er Numb	er: 2203269	
Logged by: Cla	re Griggs	Date Rece	eived:	3/10/2022	2 4:47:00 PM
Chain of Custody					
1. Is Chain of Custo	dy complete?	Yes	✓	No 🗌	Not Present
2. How was the sam	ple delivered?	<u>Client</u>			
<u>Log In</u>					
3. Coolers are prese	nt?	Yes	✓	No 🗌	NA 🗌
4. Shipping containe	r/cooler in good condition?	Yes	✓	No 🗌	
5. Custody Seals pre (Refer to commer	esent on shipping container/cooler? its for Custody Seals not intact)	Yes	✓	No 🗌	Not Present
6. Was an attempt n	nade to cool the samples?	Yes	✓	No 🗌	
7. Were all items red	evived at a temperature of >2°C to 6°C *	Yes -	✓	No 🗌	
8. Sample(s) in prop	er container(s)?	Yes [	✓	No 🗌	
9. Sufficient sample	volume for indicated test(s)?	Yes -	✓	No 🗌	
10. Are samples prop	erly preserved?	Yes	✓	No 🗌	
11. Was preservative	added to bottles?	Yes		No 🔽	NA 🗌
12. Is there headspace	e in the VOA vials?	Yes		No 🗌	NA 🔽
13. Did all samples co	ontainers arrive in good condition(unbroken)?	Yes	✓	No 🗌	
14. Does paperwork r	natch bottle labels?	Yes	✓	No 🗌	
15. Are matrices corre	ectly identified on Chain of Custody?	Yes	✓	No 🗌	
16. Is it clear what an	alyses were requested?	Yes	✓	No 🗌	
17. Were all holding t	mes able to be met?	Yes	✓	No 🗌	
Special Handling	<u>(if applicable)</u>				
18. Was client notified	d of all discrepancies with this order?	Yes		No 🗌	NA 🗹
Person Notif	ied: Date:				
By Whom:	Via:	eMail	Ph	one 🗌 Fax 🛛	In Person
Regarding:					
Client Instruc	ctions:				

#### Item Information

Item #	Temp ⁰C
Sample	3.0

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

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e Delh Saucizza 3/10/22 16:47	) 10/22 1625 × 4MSaMSarcy Lisa) Date/Time Received (Signature) Print Name ×	with shell :	Chill Streen C	x A A A Relinquished (Signature) x
e Date/Time	Date/Time Received (Signature) Print Name		M Print Name	Relinquished (Signature)
Ted Client's agreement	Fremont Analytical on behalf of the Client named above, that I have verifi	is Agreement with f this Agreement	orized to enter into the front and backside of	I represent that I am auth to each of the terms on the
	e O-Phosphate Fluoride Nitrate+Nitrite	Sulfate Bromic	Nitrite Chloride	***Anions (Circle): Nitrate
Sr Sn Ti TI V 20 X Standard Next Day	n: Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se S	ts TAL Individu	CRA-8 Priority Pollutan	**Metals (Circle): MTCA-5 P
Water, WW = Waste Water Turn-around Time:	ediment, SL = Solid, W = Water, DW = Drinking Water, GW = Ground Water, SW = Storm V	oduct, S = Soil, SD = S	B = Bulk, O = Other, P = Pr	*Matrix: A = Air, AQ = Aqueous,
				10
				9
				8
				7
		1210 5	3/10	6CR-3:6
		1250 5	3/10	5 CR-24:2
	X	1230 S	3/16	4 CN-45 %
	XX	5 0121	3/10	3 CR-24:8
	X	1220 5	3/10	2 OR-45:3
	X	1200 5	3/10	1 CR - 3: 8
Comments	# of	Sample Sample Time (Matrix)*	Sample Date	Sample Name
11111	PMEmail Christian. Can Field Shenrus 1.c			Fax:
mple Disposal: Return to client Disposal by lab (after 30 days)	Report To (PM): Christian Canfield Sam		-	Telephone:
	Location: Say Vim UNA	98103	WA	City, State, Zip: Sec + Kly
	collected by: Christian Canfield	Site 100	34th St.	Address: 400 N.
	Project No:	ne.	Wilson, 1	cient: Sugaron &
ecial Remarks:	Project Name: MUL - Cassid a load spe	ax: 206-352-7178	TONTOOL	
boratory Project No (Internal): 2203269	Date: 3/10/2022 Page: 1 of: ( Lab	eattie, WA 98103 Fel: 206-352-3790		T G
tory Services Agreement	Chain of Custody Record & Laborat	0 Fremont Ave N.	360 B	



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

Shannon & Wilson Christian Canfield 400 N. 34th Street, Suite 100 Seattle, WA 98103

RE: DNR - Cassidy Road Work Order Number: 2205114

May 10, 2022

#### **Attention Christian Canfield:**

Fremont Analytical, Inc. received 3 sample(s) on 5/5/2022 for the analyses presented in the following report.

#### Polyaromatic Hydrocarbons by EPA Method 8270 (SIM) Sample Moisture (Percent Moisture) Total Metals by EPA Method 6020B

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



CLIENT: Project: Work Order:	Shannon & Wilson DNR - Cassidy Road 2205114	Work Order Sample Summary					
Lab Sample ID	Client Sample ID	Date/Time Collected	Date/Time Received				
2205114-001	CR-59:1	05/04/2022 1:00 PM	05/05/2022 8:34 AM				
2205114-002	CR-61:3	05/04/2022 2:30 PM	05/05/2022 8:34 AM				
2205114-003	CR-56:3	05/04/2022 12:50 PM	05/05/2022 8:34 AM				

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



**Case Narrative** 

WO#: **2205114** Date: **5/10/2022** 

CLIENT:Shannon & WilsonProject:DNR - Cassidy Road

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 & Acronyms**



WO#: **2205114** Date Reported: **5/10/2022** 

#### Qualifiers:

- \* Flagged value is not within established 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 Reporting 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



Shannon & Wilson

CLIENT:

### **Analytical Report**

Project: DNR - Cassidy Road								
Lab ID: 2205114-001 Client Sample ID: CR-59:1		Collection Date: 5/4/2022 1:00:00 PM Matrix: Soil						
Analyses	Result	RL	Qual	Units	DF	Date Analyzed		
Total Metals by EPA Method 6020	B			Batch	ID: 36	342 Analyst: EH		
Arsenic	3.99	0.107		mg/Kg-dry	1	5/9/2022 11:34:44 AM		
Copper	23.2	0.890		mg/Kg-dry	1	5/9/2022 11:34:44 AM		
Lead	147	1.78	D	mg/Kg-dry	10	5/9/2022 12:41:19 PM		
Sample Moisture (Percent Moistur	re)			Batch	ID: R7	75244 Analyst: AK		
Percent Moisture	12.9	0.500		wt%	1	5/6/2022 2:02:07 PM		



Shannon & Wilson

CLIENT:

### **Analytical Report**

 Work Order:
 2205114

 Date Reported:
 5/10/2022

Collection Date: 5/4/2022 2:30:00 PM

Matrix: Soil

# Project:DNR - Cassidy RoadLab ID:2205114-002Client Sample ID:CR-61:3

Analyses	Result	RL	Qual	Units	D	F Date	e Analyzed
Polyaromatic Hydrocarbons by EPA	Method	<u>8270 (SIM)</u>		Batch	ID:	36335	Analyst: OK
Naphthalene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
- 2-Methylnaphthalene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
1-Methylnaphthalene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Acenaphthylene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Acenaphthene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Fluorene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Phenanthrene	ND	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Anthracene	ND	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Fluoranthene	ND	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Pyrene	ND	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Benz(a)anthracene	34.7	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Chrysene	47.0	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Benzo(b)fluoranthene	38.4	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Benzo(k)fluoranthene	ND	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Benzo(a)pyrene	44.5	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Indeno(1,2,3-cd)pyrene	ND	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Dibenz(a,h)anthracene	ND	43.4		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Benzo(g,h,i)perylene	23.6	21.7		µg/Kg-dry	1	5/6/2	2022 5:55:45 PM
Surr: 2-Fluorobiphenyl	71.9	29.6 - 130		%Rec	1	5/6/2	2022 5:55:45 PM
Surr: Terphenyl-d14 (surr)	67.8	38 - 145		%Rec	1	5/6/2	2022 5:55:45 PM
Total Metals by EPA Method 6020B				Batch	ID:	36342	Analyst: EH
Arsenic	4.25	0.115		mg/Kg-dry	1	5/9/2	2022 11:37:34 AM
Copper	24.5	0.957		mg/Kg-dry	1	5/9/2	2022 11:37:34 AM
Lead	41.4	0.191		mg/Kg-dry	1	5/9/2	2022 11:37:34 AM
Sample Moisture (Percent Moisture)				Batch	ID:	R75244	Analyst: AK
Percent Moisture	17.7	0.500		wt%	1	5/6/2	2022 2:02:07 PM



Shannon & Wilson

CLIENT:

### **Analytical Report**

Project: DNR - Cassidy Road							
Lab ID: 2205114-003 Client Sample ID: CR-56:3			Collection Date: 5/4/2022 12:50:00 PM Matrix: Soil				
Analyses	Result	RL Qual	Units	DF	Date Analyzed		
Total Metals by EPA Method 6020	B		Batch	ID: 36	342 Analyst: EH		
Arsenic	3.12	0.110	mg/Kg-dry	1	5/9/2022 11:40:23 AM		
Copper	24.2	0.914	mg/Kg-dry	1	5/9/2022 11:40:23 AM		
Lead	114	0.183	mg/Kg-dry	1	5/9/2022 11:40:23 AM		
Sample Moisture (Percent Moistur	<u>re)</u>		Batch	ID: R	75244 Analyst: AK		
Percent Moisture	15.8	0.500	wt%	1	5/6/2022 2:02:07 PM		



Work Order:	2205114								00.5	ειιμαι		PORT
CLIENT:	Shannon &	Wilson										
Project:	DNR - Cass	idy Road							Total Meta	als by EPA	Method	6020B
Sample ID: MB-3	6342	SampType: MBLK			Units: <b>mg/Kg</b>		Prep Dat	e: <b>5/5/202</b>	2	RunNo: 752	266	
Client ID: MBL	(S	Batch ID: 36342					Analysis Dat	e: <b>5/9/202</b>	2	SeqNo: 154	4140	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic		ND	0.0902									
Copper		ND	0.752									
Lead		ND	0.150									
Sample ID: LCS-	36342	SampType: LCS			Units: mg/Kg		Prep Dat	e: <b>5/5/202</b>	2	RunNo: 752	266	
Client ID: LCSS	5	Batch ID: 36342					Analysis Dat	e: <b>5/9/202</b>	2	SeqNo: 154	4141	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic		35.3	0.0923	38.46	0	91.7	80	120				
Copper		37.7	0.769	38.46	0	98.1	80	120				
Lead		18.7	0.154	19.23	0	97.5	80	120				
Sample ID: 22051	19-012AMS	SampType: MS			Units: mg/Kg-	dry	Prep Dat	e: 5/5/202	2	RunNo: 752	266	
Client ID: BATC	н	Batch ID: 36342					Analysis Dat	e: <b>5/9/202</b>	2	SeqNo: 154	14144	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic		56.9	0.134	55.72	2.335	97.9	75	125				
Copper		95.1	1.11	55.72	37.94	103	75	125				
Lead		30.4	0.223	27.86	4.983	91.4	75	125				
Sample ID: 22051	19-012AMSD	SampType: MSD			Units: mg/Kg-	dry	Prep Dat	e: <b>5/5/202</b>	2	RunNo: 752	266	
Client ID: BATC	н	Batch ID: 36342					Analysis Dat	e: <b>5/9/202</b>	2	SeqNo: 154	4145	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Arsenic		52.8	0.133	55.30	2.335	91.3	75	125	56.88	7.40	20	
Copper		89.2	1.11	55.30	37.94	92.7	75	125	95.07	6.39	20	
Lead		29.3	0.221	27.65	4.983	88.0	75	125	30.44	3.83	20	



Fremont
Analytical

Work Order: 2	205114							00	SUMMARY REF	
CLIENT: S	Shannon & Wilson									
Project: [	Project: DNR - Cassidy Road					Po	lyaromat	ic Hydrocarbons b	by EPA Method 827	0 (SIM)
Sample ID: MB-36335 SampType: MBLK		/pe: MBLK			Units: µg/Kg		Prep Dat	e: <b>5/5/2022</b>	RunNo: 75272	
Client ID: MBLKS	Batch ID	D: 36335					Analysis Dat	e: <b>5/6/2022</b>	SeqNo: 1544299	
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							
Acenaphthylene		ND	20.0							
Acenaphthene		ND	20.0							
Fluorene		ND	20.0							
Phenanthrene		ND	40.0							
Anthracene		ND	40.0							
Fluoranthene		ND	40.0							
Pyrene		ND	40.0							
Benz(a)anthracene		ND	20.0							
Chrysene		ND	40.0							
Benzo(b)fluoranthene	•	ND	20.0							
Benzo(k)fluoranthene		ND	20.0							
Benzo(a)pyrene		ND	20.0							
Indeno(1,2,3-cd)pyrer	ne	ND	40.0							
Dibenz(a,h)anthracen	e	ND	40.0							
Benzo(g,h,i)perylene		ND	20.0							
Surr: 2-Fluorobiphe	enyl	695		1,000		69.5	29.6	130		
Surr: Terphenyl-d1	4 (surr)	654		1,000		65.4	38	145		
Sample ID: LCS-363	35 SampTy	/pe: LCS			Units: µg/Kg		Prep Dat	e: <b>5/5/2022</b>	RunNo: <b>75272</b>	
Client ID: LCSS	Batch ID	D: 36335					Analysis Dat	e: <b>5/6/2022</b>	SeqNo: 1544300	
Analyte		Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit RPD Ref Val	%RPD RPDLimit	Qual
Naphthalene		1,840	20.0	2,000	0	91.9	60.2	119		
2-Methylnaphthalene		2,050	20.0	2,000	0	103	60.4	121		
1-Methylnaphthalene		2,030	20.0	2,000	0	102	62	119		
Acenaphthylene		1,970	20.0	2,000	0	98.6	58.5	120		
Acenaphthene		1,840	20.0	2,000	0	92.0	57.8	117		



Work Order:	2205114				0	C SUMMARY REPORT
CLIENT:	Shannon & W	ilson				
Project:	DNR - Cassid	y Road		Polyaromatic	: Hydrocarbo	ns by EPA Method 8270 (SIM)
Sample ID: LCS-3	6335	SampType: LO	S Units: µg/Kg	Prep Date:	5/5/2022	RunNo: <b>75272</b>
		Batch ID: 30	235	Analysis Date:	5/6/2022	SeaNo: 1544300

Client ID: LCSS	Batch ID: 36335					Analysis Da	te: <b>5/6/202</b>	2	SeqNo: 154	4300	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Fluorene	1,850	20.0	2,000	0	92.4	60.3	122				
Phenanthrene	1,800	40.0	2,000	0	89.9	58.6	120				
Anthracene	1,840	40.0	2,000	0	92.2	58.1	122				
Fluoranthene	1,800	40.0	2,000	0	90.0	61.8	123				
Pyrene	1,790	40.0	2,000	0	89.6	59.8	122				
Benz(a)anthracene	1,940	20.0	2,000	0	97.2	62.7	123				
Chrysene	1,790	40.0	2,000	0	89.3	56.2	123				
Benzo(b)fluoranthene	1,860	20.0	2,000	0	92.8	56.6	126				
Benzo(k)fluoranthene	1,750	20.0	2,000	0	87.7	56.9	131				
Benzo(a)pyrene	1,660	20.0	2,000	0	82.9	63.8	134				
Indeno(1,2,3-cd)pyrene	1,670	40.0	2,000	0	83.4	59.3	122				
Dibenz(a,h)anthracene	1,680	40.0	2,000	0	84.0	60.4	125				
Benzo(g,h,i)perylene	1,550	20.0	2,000	0	77.4	52.7	126				
Surr: 2-Fluorobiphenyl	841		1,000		84.1	29.6	130				
Surr: Terphenyl-d14 (surr)	762		1,000		76.2	38	145				

Sample ID: 2205069-001AMS	SampType: <b>MS</b>			Units: µg/Kg	J-dry	Prep Dat	te: 5/5/202	2	RunNo: 752	72	
Client ID: BATCH	Batch ID: 36335					Analysis Da	te: 5/6/202	2	SeqNo: 154	4302	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,630	19.3	1,933	0	84.2	30.2	123				
2-Methylnaphthalene	1,820	19.3	1,933	0	94.1	40.9	115				
1-Methylnaphthalene	1,800	19.3	1,933	0	93.2	35.6	121				
Acenaphthylene	1,770	19.3	1,933	0	91.3	37.6	117				
Acenaphthene	1,610	19.3	1,933	0	83.3	35.6	115				
Fluorene	1,620	19.3	1,933	0	84.0	38.8	119				
Phenanthrene	1,570	38.7	1,933	0	81.1	32.8	120				
Anthracene	1,600	38.7	1,933	0	82.8	33.7	122				
Fluoranthene	1,590	38.7	1,933	0	82.1	37.5	124				
Pyrene	1,570	38.7	1,933	0	81.3	34	122				



Work Order: 2205114

Work Order:	2205114									2.00	SUMMAI		PORT
CLIENT:	Shannon &	Wilson					_						
Project:	DNR - Case	idy Road					Po	lyaroma	tic Hydro	ocarbons b	y EPA Me	thod 827	0 (SIM)
Sample ID: 22050	69-001AMS	SampType	e: MS			Units: µg	/Kg-dry	Prep Da	te: 5/5/202	22	RunNo: 752	272	
Client ID: BATC	н	Batch ID:	36335					Analysis Da	te: 5/6/202	22	SeqNo: 154	44302	
Analyte			Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Benz(a)anthracene	e		1,700	19.3	1,933	4.498	87.5	34.7	127				
Chrysene			1,560	38.7	1,933	0	80.5	33.4	120				
Benzo(b)fluoranthe	ene		1,580	19.3	1,933	0	81.8	31.8	125				
Benzo(k)fluoranthe	ene		1,530	19.3	1,933	0	79.3	30.2	129				
Benzo(a)pyrene			1,410	19.3	1,933	0	73.2	31.3	139				
Indeno(1,2,3-cd)py	/rene		1,430	38.7	1,933	0	74.1	22.8	126				
Dibenz(a,h)anthrae	cene		1,450	38.7	1,933	0	74.9	28.1	127				
Benzo(g,h,i)peryle	ne		1,310	19.3	1,933	0	67.9	18.7	125				
Surr: 2-Fluorobi	phenyl		723		966.6		74.8	29.6	130				
Surr: Terphenyl	-d14 (surr)		659		966.6		68.2	38	145				
Sample ID: 22050	69-001AMSD	SampType	e: MSD			Units: µg	/Kg-dry	Prep Da	te: <b>5/5/202</b>	22	RunNo: 752	272	

	1 21			10 0		•					
Client ID: BATCH	Batch ID: 36335					Analysis Da	ite: 5/6/202	2	SeqNo: 154	4303	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Naphthalene	1,720	20.5	2,055	0	83.5	30.2	123	1,628	5.30	30	
2-Methylnaphthalene	1,920	20.5	2,055	0	93.3	40.9	115	1,819	5.26	30	
1-Methylnaphthalene	1,890	20.5	2,055	0	92.1	35.6	121	1,802	4.88	30	
Acenaphthylene	1,850	20.5	2,055	0	90.0	37.6	117	1,765	4.66	30	
Acenaphthene	1,710	20.5	2,055	0	83.1	35.6	115	1,610	5.82	30	
Fluorene	1,730	20.5	2,055	0	84.2	38.8	119	1,623	6.38	30	
Phenanthrene	1,660	41.1	2,055	0	80.9	32.8	120	1,568	5.83	30	
Anthracene	1,730	41.1	2,055	0	84.2	33.7	122	1,600	7.82	30	
Fluoranthene	1,680	41.1	2,055	0	82.0	37.5	124	1,587	5.97	30	
Pyrene	1,670	41.1	2,055	0	81.4	34	122	1,571	6.23	30	
Benz(a)anthracene	1,800	20.5	2,055	4.498	87.5	34.7	127	1,695	6.18	30	
Chrysene	1,680	41.1	2,055	0	81.7	33.4	120	1,557	7.52	30	
Benzo(b)fluoranthene	1,690	20.5	2,055	0	82.0	31.8	125	1,581	6.37	30	
Benzo(k)fluoranthene	1,640	20.5	2,055	0	79.6	30.2	129	1,532	6.58	30	
Benzo(a)pyrene	1,510	20.5	2,055	0	73.6	31.3	139	1,414	6.69	30	



#### Work Order: 2205114

CLIENT: Shannon & Wilson

### QC SUMMARY REPORT

Project: DNR - Cassidy Road

Polyaromatic Hydrocarbons by EPA Method 8270 (SIM)

Sample ID: 2205069-001AMSD	SampType: MSD			Units: µg/Kg	-dry	Prep Dat	te: 5/5/202	2	RunNo: 752	272	
Client ID: BATCH	Batch ID: 36335					Analysis Da	te: 5/6/202	2	SeqNo: 154	4303	
Analyte	Result	RL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Indeno(1,2,3-cd)pyrene	1,530	41.1	2,055	0	74.3	22.8	126	1,432	6.38	30	
Dibenz(a,h)anthracene	1,540	41.1	2,055	0	75.0	28.1	127	1,449	6.21	30	
Benzo(g,h,i)perylene	1,400	20.5	2,055	0	68.0	18.7	125	1,312	6.24	30	
Surr: 2-Fluorobiphenyl	756		1,027		73.6	29.6	130		0		
Surr: Terphenyl-d14 (surr)	697		1,027		67.9	38	145		0		



### Sample Log-In Check List

Logged by:       Elisabeth Samoray       Date Received:       5/5/2022 8:34:00 AM         Chain of Custody       Participation       No       Not Present         1.       Is Chain of Custody complete?       Yes       No       Not Present         2.       How was the sample delivered?       Client       No       Not Present         Logg In       Yes       No       No       NA         3.       Coolers are present?       Yes       No       NA         4.       Shipping container/cooler in good condition?       Yes       No       Not Present         5.       Custody Seals present on shipping container/cooler?       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       NA         9.       Sufficient sample volume for indicated test(s)?       Yes       No       NA         10.       Are samples properly preserved?       Yes       No       NA         11.       Was preservative added to bottles?       Yes       No       NA
Chain of Custody         1. Is Chain of Custody complete?       Yes       No       Not Present         2. How was the sample delivered?       Client         Log In
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         4. Shipping container/cooler in good condition?       Yes       No         5. Custody Seals present on shipping container/cooler?       Yes       No       No         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       NA       .         9. Sufficient sample volume for indicated test(s)?       Yes       No       NA         10. Are samples properly preserved?       Yes       No       NA         11. Was preservative added to bottles?       Yes       No       NA         12. Is there headspace in the VOA vials?       Yes       No       NA
2. How was the sample delivered?       Client         Log In
Log In         3. Coolers are present?       Yes       No       NA         4. Shipping container/cooler in good condition?       Yes       No       NA         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       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       NA         9. Sufficient sample volume for indicated test(s)?       Yes       No       NA         10. Are samples properly preserved?       Yes       No       NA         11. Was preservative added to bottles?       Yes       No       NA         12. Is there headspace in the VOA vials?       Yes       No       NA
3. Coolers are present?       Yes       No       NA         4. Shipping container/cooler in good condition?       Yes       No       NA         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       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       Ves       No       NA         9. Sufficient sample volume for indicated test(s)?       Yes       No       NA         10. Are samples properly preserved?       Yes       No       NA         11. Was preservative added to bottles?       Yes       No       NA         12, Is there headspace in the VOA vials?       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       Yes       No         9. Sufficient sample volume for indicated test(s)?       Yes       No       NA         10. Are samples properly preserved?       Yes       No       NA         11. Was preservative added to bottles?       Yes       No       NA         12, Is there headspace in the VOA vials?       Yes       No       NA
4. Shipping container/cooler in good condition?       Yes       No       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       Ves       No       NA         9. Sufficient sample volume for indicated test(s)?       Yes       No       Na         10. Are samples properly preserved?       Yes       No       NA         11. Was preservative added to bottles?       Yes       No       NA         12. Is there headspace in the VOA vials?       Yes       No       NA
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       NA         9. Sufficient sample volume for indicated test(s)?       Yes       ✔       No       NA         10. Are samples properly preserved?       Yes       ✔       No       NA         11. Was preservative added to bottles?       Yes       No       NA         12. Is there headspace in the VOA vials?       Yes       No       NA
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       NA         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          12. Is there headspace in the VOA vials?       Yes       ✓       No
6. Was an attempt made to cool the samples:       105 €       100 €       101 €         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 □       NA □         9. Sufficient sample volume for indicated test(s)?       Yes ♥       No □       10. Are samples properly preserved?       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 ♥
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       No         9. Sufficient sample volume for indicated test(s)?       Yes ♥       No       Image: Control of the sample spectrum of the samples properly preserved?       Yes ♥       No         10. Are samples properly preserved?       Yes ♥       No       Image: Control of the sample spectrum of the samples properly preserved?       Yes ♥       No       Image: Control of the sample spectrum of sample spectrum of the sample
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
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         12. Is there headspace in the VOA vials?       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         12. Is there headspace in the VOA vials?       Yes       ✓       No       ✓
10. Are samples properly preserved?       Yes       No       □         11. Was preservative added to bottles?       Yes       No       ✓         12. Is there headspace in the VOA vials?       Yes       No       ✓
11. Was preservative added to bottles?   Yes   No   NA     12. Is there headspace in the VOA vials?   Yes   No   NA
12. Is there headspace in the VOA vials? Yes No No NA
13. Did all samples containers arrive in good condition(unbroken)? Yes 🗹 No 🗌
14. Does paperwork match bottle labels? Yes 🗹 No
15. Are mannees confectly identified on Chain of Custody? Fes ♥ No □
10. Is it clear what analyses were requested? Yes ♥ NO □
17. were all holding times able to be met? Thes ♥ No □
<u>Special Handling (if applicable)</u>
18. Was client notified of all discrepancies with this order? Yes No No NA
Person Notified: Date:
By Whom: Via: eMail Phone Fax In Person
Regarding:
Client Instructions:
19 Additional remarks:

	Item #	Temp °C
Sample 1		3.0

\* Note: DoD/ELAP and TNI require items to be received at  $4^{\circ}C$  +/-  $2^{\circ}C$ 

	3600 Fremont Ave N.	Chain of Cu	ustody Record &	Laboratory Services Agreement	
Fremon	Seattle, WA 98103 Tel: 206-352-3790	Date: 5/4/2022	Page: / of:	Laboratory Project No (Internal): 2365114	4
- Analytica	71 Fax: 206-352-7178	Project Name: DNR	- Cassidy for	24 Special Remarks:	f of 1
client: Sharmon & Wils	Som Inc	Project No: 107843	-005		de 14
Address: 40 N. 34th	1 St. Sitek	Collected by: CTC			Pa
city, State, Zip: South Control Cult	E01863	Location: Clallan	Gunty WH		
Telephone:		Report To (PM): CUCST	ian Cantiel	Sample Disposal: Return to client Refusposal by lab (after 30 days)	
Fax:		PM Email: Ctcost	unwil com		
			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Sample Name	Sample Sample Type Date Time (Matri	Image: state         Image: state<		or ter States States	
1:0R-59:1	5/4 1300 S		X		1
2 CR-61:3	S/4 1830 S		XX		
3 CR-56:3	5/4 1250 5		X		
4					
5					
6					
7					
8					
9					
10	/				
*Matrix: A = Air, AQ = Aqueous, B = Bulk, O =	Other, P = Product, S = Soil, SC	) = Sediment, SL = Solid, W = Water,	DW = Drinking Water, GW = Ground Wa	vater, SW = Storm Water, WW = Waste Water Turn-around Time:	
**Metals (Circle): MTCA-5 RCRA-8 Pri	iority Pollutants TAL Indi	idual: Ag Al As B Ba Be Ca Cd	Co Cr 🗭 Fe Hg K Mg Mn Mo Na	va Ni Pb Sb Se Sr Sn Ti Ti V Zn A Standard A Next Day	
***Anions (Circle): Nitrate Nitrite	Chloride Sulfate Bro	mide O-Phosphate Fluoride	e Nitrate+Nitrite	3 Day Same Day	-
I represent that I am authorized to en- to each of the terms on the front and	nter into this Agreement w backside of this Agreemen	ith Fremont Analytical on beh ıt.	alf of the Client named above, th	that I have verified Client's agreement	
	mint Name	Date/Time Cichon 2000	Received (Signature) * aller Jrean	Max Trado 5/5/22 8:34	
Relinquished (Signature) x	Print Name	Date/Time	Received (Signature)	Print Name O Date/Time	
COC 1.3 - 11.06.20		www.fremo	ontanalytical.com	P	•

# Important Information

About Your Environmental Report

# CONSULTING SERVICES ARE PERFORMED FOR SPECIFIC PURPOSES AND FOR SPECIFIC CLIENTS.

Consultants prepare reports to meet the specific needs of specific individuals. A report prepared for a civil engineer may not be adequate for a construction contractor or even another civil engineer. Unless indicated otherwise, your consultant prepared your report expressly for you and expressly for the purposes you indicated. No one other than you should apply this report for its intended purpose without first conferring with the consultant. No party should apply this report for any purpose other than that originally contemplated without first conferring with the consultant.

### THE CONSULTANT'S REPORT IS BASED ON PROJECT-SPECIFIC FACTORS.

A geotechnical/environmental report is based on a subsurface exploration plan designed to consider a unique set of project-specific factors. Depending on the project, these may include the general nature of the structure and property involved; its size and configuration; its historical use and practice; the location of the structure on the site and its orientation; other improvements such as access roads, parking lots, and underground utilities; and the additional risk created by scope-of-service limitations imposed by the client. To help avoid costly problems, ask the consultant to evaluate how any factors that change subsequent to the date of the report may affect the recommendations. Unless your consultant indicates otherwise, your report should not be used (1) when the nature of the proposed project is changed (for example, if an office building will be erected instead of a parking garage, or if a refrigerated warehouse will be built instead of an unrefrigerated one, or chemicals are discovered on or near the site); (2) when the size, elevation, or configuration of the proposed project is altered; (3) when the location or orientation of the proposed project is modified; (4) when there is a change of ownership; or (5) for application to an adjacent site. Consultants cannot accept responsibility for problems that may occur if they are not consulted after factors that were considered in the development of the report have changed.

### SUBSURFACE CONDITIONS CAN CHANGE.

Subsurface conditions may be affected as a result of natural processes or human activity. Because a geotechnical/environmental report is based on conditions that existed at the time of subsurface exploration, construction decisions should not be based on a report whose adequacy may have been affected by time. Ask the consultant to advise if additional tests are desirable before construction starts; for example, groundwater conditions commonly vary seasonally.

Construction operations at or adjacent to the site and natural events such as floods, earthquakes, or groundwater fluctuations may also affect subsurface conditions and, thus, the continuing adequacy of a geotechnical/environmental report. The consultant should be kept apprised of any such events and should be consulted to determine if additional tests are necessary.

### MOST RECOMMENDATIONS ARE PROFESSIONAL JUDGMENTS.

Site exploration and testing identifies actual surface and subsurface conditions only at those points where samples are taken. The data were extrapolated by your consultant, who then applied judgment to render an opinion about overall subsurface conditions. The actual interface between materials may be far more gradual or abrupt than your report indicates. Actual conditions in areas not sampled may differ from those predicted in your report. While nothing can be done to prevent such situations, you and your consultant can work together to help reduce their impacts. Retaining

your consultant to observe subsurface construction operations can be particularly beneficial in this respect.

#### A REPORT'S CONCLUSIONS ARE PRELIMINARY.

The conclusions contained in your consultant's report are preliminary, because they must be based on the assumption that conditions revealed through selective exploratory sampling are indicative of actual conditions throughout a site. Actual subsurface conditions can be discerned only during earthwork; therefore, you should retain your consultant to observe actual conditions and to provide conclusions. Only the consultant who prepared the report is fully familiar with the background information needed to determine whether or not the report's recommendations based on those conclusions are valid and whether or not the contractor is abiding by applicable recommendations. The consultant who developed your report cannot assume responsibility or liability for the adequacy of the report's recommendations if another party is retained to observe construction.

### THE CONSULTANT'S REPORT IS SUBJECT TO MISINTERPRETATION.

Costly problems can occur when other design professionals develop their plans based on misinterpretation of a geotechnical/environmental report. To help avoid these problems, the consultant should be retained to work with other project design professionals to explain relevant geotechnical, geological, hydrogeological, and environmental findings, and to review the adequacy of their plans and specifications relative to these issues.

# BORING LOGS AND/OR MONITORING WELL DATA SHOULD NOT BE SEPARATED FROM THE REPORT.

Final boring logs developed by the consultant are based upon interpretation of field logs (assembled by site personnel), field test results, and laboratory and/or office evaluation of field samples and data. Only final boring logs and data are customarily included in geotechnical/environmental reports. These final logs should not, under any circumstances, be redrawn for inclusion in architectural or other design drawings, because drafters may commit errors or omissions in the transfer process.

To reduce the likelihood of boring log or monitoring well misinterpretation, contractors should be given ready access to the complete geotechnical engineering/environmental report prepared or authorized for their use. If access is provided only to the report prepared for you, you should advise contractors of the report's limitations, assuming that a contractor was not one of the specific persons for whom the report was prepared, and that developing construction cost estimates was not one of the specific purposes for which it was prepared. While a contractor may gain important knowledge from a report prepared for another party, the contractor should discuss the report with your consultant and perform the additional or alternative work believed necessary to obtain the data specifically appropriate for construction cost estimating purposes. Some clients hold the mistaken impression that simply disclaiming responsibility for the accuracy of subsurface information always insulates them from attendant liability. Providing the best available information to contractors helps prevent costly construction problems and the adversarial attitudes that aggravate them to a disproportionate scale.

### READ RESPONSIBILITY CLAUSES CLOSELY.

Because geotechnical/environmental engineering is based extensively on judgment and opinion, it is far less exact than other design disciplines. This situation has resulted in wholly unwarranted claims

being lodged against consultants. To help prevent this problem, consultants have developed a number of clauses for use in their contracts, reports, and other documents. These responsibility clauses are not exculpatory clauses designed to transfer the consultant's liabilities to other parties; rather, they are definitive clauses that identify where the consultant's responsibilities begin and end. Their use helps all parties involved recognize their individual responsibilities and take appropriate action. Some of these definitive clauses are likely to appear in your report, and you are encouraged to read them closely. Your consultant will be pleased to give full and frank answers to your questions.

The preceding paragraphs are based on information provided by the GBA, Silver Spring, Maryland