



# Testing 6PPD-quinone on the Snoqualmie Reservation

## Quality Assurance Project Plan

By

**Environmental and Natural Resources Department of  
the Snoqualmie Indian Tribe**

For the

**Water Quality Program**

Washington State Department of Ecology

Olympia, Washington

July 2024, Publication 24-10-049

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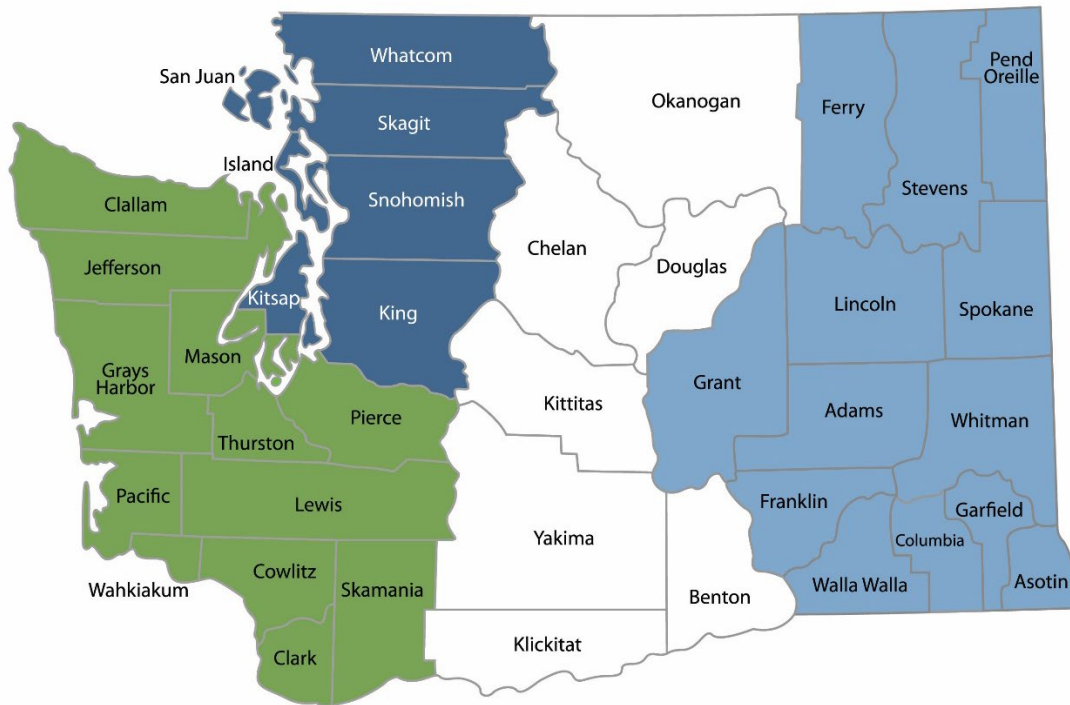
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## Map of Counties Served



<b>Southwest Region</b> 360-407-6300	<b>Northwest Region</b> 206-594-0000	<b>Central Region</b> 509-575-2490	<b>Eastern Region</b> 509-329-3400
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Region	Counties served	Mailing Address	Phone
<b>Southwest</b>	Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Mason, Lewis, Pacific, Pierce, Skamania, Thurston, Wahkiakum	PO Box 47775 Olympia, WA 98504	360-407-6300
<b>Northwest</b>	Island, King, Kitsap, San Juan, Skagit, Snohomish, Whatcom	PO Box 330316 Shoreline, WA 98133	206-594-0000
<b>Central</b>	Benton, Chelan, Douglas, Kittitas, Klickitat, Okanogan, Yakima	1250 W Alder St Union Gap, WA 98903	509-575-2490
<b>Eastern</b>	Adams, Asotin, Columbia, Ferry, Franklin, Garfield, Grant, Lincoln, Pend Oreille, Spokane, Stevens, Walla Walla, Whitman	4601 N Monroe Spokane, WA 99205	509-329-3400
<b>Headquarters</b>	Across Washington	PO Box 47600 Olympia, WA 98504	360-407-6000

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Water Quality Program  
Washington State Department of Ecology  
Olympia, WA

**July 2024 | Publication 24-10-049**

**Prepared for Ecology in support of 6PPD research by Environmental and Natural  
Resources Department of the Snoqualmie Indian Tribe**



DEPARTMENT OF  
**ECOLOGY**  
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## Background

6PPD-quinone (6PPD-q) is a newly identified stormwater contaminant. 6PPD-q is a transformation product of 6PPD in vehicle tires, and 6PPD-q has been identified as the second most toxic chemical to aquatic organisms. 6PPD-q is acutely toxic to coho salmon, causing mortality at concentrations less than 0.10 micrograms per liter, and is also acutely toxic or potentially causes sublethal effects in other salmonids.

The Snoqualmie River Watershed supports all five species of anadromous salmon, rainbow trout and brook trout which have been shown to be especially impacted by 6PPD-q. Other aquatic species of concern to the Snoqualmie Tribe include brook lamprey, freshwater mussels, amphibians, and benthic invertebrates. Much is still unknown about the fate and transport of 6PPD-q, including impacts to food webs and human health. Learning more about 6PPD-q is essential to ensure water quality and protection of cultural resources and will be of benefit to the Snoqualmie Indian Tribe in protecting tribal sovereign and inherent rights.

In October of 2006 the Snoqualmie Indian Tribe was awarded an initial reservation of 56 acres within the 6,000-acre Kimball/Coal Creek drainage basin located in the Snoqualmie Watershed. The Tribe continues to add other parcels into trust which contain streams and wetlands and connect to the Snoqualmie River. A large portion of the initial Reservation has been developed into the Snoqualmie Casino. The Snoqualmie Casino site is surrounded by steep slopes on the western, eastern, and northern edges which frame the streams and wetlands on the Reservation. Runoff from impervious surfaces on the Reservation is the main cause of surface water pollution.

Other research studies have shown a direct connection between road density and traffic to 6PPD-q mortalities. We currently estimate that 4,100 vehicles cross the Reservation every day and expect that will increase to an average of 4,268 vehicles once the new hotel opens. These estimates are determined from information related to the number of visitors who engage in gaming, dining, and entertainment activities as well as staff team members attending for work. This is ultimately an underestimation of vehicle traffic because it does not include deliveries, shuttles for drop-off, or traffic related to the construction of the new hotel.

## Project and Task Description

The Snoqualmie Tribe's Environmental and Natural Resources Department is tasked with monitoring the streams and wetlands on Tribal lands to ensure that water quality standards are met. This Quality Assurance Project Plan describes how we will add 6PPD-q sampling to the Tribe's established Nonpoint Source Pollution Monitoring Project. This will advance the Tribe's understanding of 6PPD-q concentrations in stormwater and waterways on the Snoqualmie Reservation, across storms and seasons.

The Tribe's Nonpoint Source Pollution Monitoring Project was created in 2008 has been collecting twice annual data on stormwater to inform water quality decisions. Eight (8) sampling sites were strategically chosen to assess water quality on the reservation. This project will modify the established experimental design for 6PPD-q collection.

This study will advance understanding of baseline 6PPD-q concentrations on the Reservation. We will also gather and describe land use and best management practices (BMP) characteristics. This could help assess and/or validate the effectiveness of BMPS in mitigating 6PPD-q pollution.

A subset of these sample sites will be used to better understand how land use features like parking lots, roads, and upstream development impact 6PPD-q concentrations. Another subset will help determine if the floating treatment wetlands in the stormwater pond, installed in the fall of 2023, help reduce 6PPD-q. Finally, samples will assess the effectiveness of vegetated swales in the parking lot of the Snoqualmie Casino. Though the swales do not include bioretention soil media, swales like these are common BMPs alongside roadways throughout Washington and understanding their effectiveness will aid in 6PPD-q management.

## Organization and Schedule

The indigenous and inherent sovereign power of the Snoqualmie Indian Tribe is vested in the Snoqualmie Tribal Council. The Snoqualmie Tribal Council has the authority to safeguard and promote the peace, safety, moral, and general welfare of the members of the Tribe by regulating the behavior of all persons within the jurisdiction of the Tribe, and to provide for the enactment and enforcement of the laws of the Tribe. This authority includes the Council's ability to manage, develop, protect, and regulate water, minerals, timber, fish, and wildlife, and other natural resources within the Tribe's jurisdiction.

The Environmental and Natural Resources (ENR) Department is designated as the lead Tribal department for all matters pertaining to the environmental protection of Tribal water resources. The ENR Department has the primary responsibility for project coordination and ensuring that data collection and evaluation meet quality assurance criteria.

The key individuals involved in project implementation are ENR Director Cindy Spiry, ENR Water Quality Program Manager Kelsey Payne, ENR Water Quality Program Assistant Jennifer Hartke, as well as rotating field staff.

The Water Quality Program Manager has a Bachelor of Science degree in Environmental Sciences from Western Washington University and a Master of Science degree from the University of Washington. The Water Quality Manager has completed classwork and on-the-job training in water quality sampling and data collection. She has over seven years of professional experience in the field and has worked for the Snoqualmie Tribe for over three years.

The Water Quality Program Assistant has a Bachelor of Science degree in Environmental Sciences from Western Washington University and previous experience as a hydrologist with US Geological Survey. Training in water quality will be ongoing. The ENR Director will provide information on offsite training, conferences, and classes that are pertinent to water quality.

Table 1. Schedule of activities

Activity	Start Date	Projected Date of Completion	Notes
<b>Project Management</b>	April 1, 2024	June 30, 2025	
<b>QAPP Approval</b>	May 7, 2024	May 31, 2024	Needs Ecology approval
<b>Field Work</b>	September 2024	March 2025	8 days sampling at 8 sites, for a total of 128 samples. Timing will be limited by rain events.
<b>Laboratory Analysis</b>	Ongoing	March 2025	The Tribe will share with Ecology individual lab reports as they are completed by MEL. Additionally, the Tribe will compile a spreadsheet of lab results with 6PPD-q concentrations in water quality samples.
<b>Progress Report</b>	Ongoing	November 15, 2024	
<b>Spreadsheet of Lab Results</b>	Ongoing	March 30, 2025	
<b>Communications/Final Report</b>	March 2025	June 2025	The final report should include key details including but not limited to: 6PPD-q lab analyses, traffic density of the Snoqualmie Casino parking lot and North Bend Way, upstream development activities, vegetation species in the swale and floating wetlands, and additional characteristics of BMPs.
<b>Field Procedures Report</b>	Ongoing	April 15, 2025	Describes, for each sampling event, relevant field notes on conditions at the location and the sample at the time of collection, sample volume collected, and chain of custody forms.
<b>Presentations</b>	Ongoing	May 14, 2025	Stormwater Work Group 6PPD Subgroup and an additional audience -Affiliated Tribes of Northwest Indians, Northwest Indian Fisheries Coordinated

			Tribal Water Quality Program, or MuniCon
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The greatest challenge in keeping to this timeline is the constraints around the timing of sampling during storm events. There will need to be flexibility in the schedule on days when it is raining to be able to achieve sampling goals. If sampling deviates from the specified protocol, we will document the timing of the rain event and conditions of sampling thoroughly for accurate comparisons and result interpretation. Sampling frequency and the number of samples per rain event is determined by the project budget, limiting the number of samples that can be collected. The timeline for the project is limited to funding availability, allowing for only one rainy season (October-April) of data collection before project completion.

## Experimental Design

Please reference Figure 1 for sample site locations.

Sample site **A1** is outflow pipe that feeds in the longest stream on the Snoqualmie Reservation. It is at the southern edge of the reservation; this site is an area where the stream is fed through a culvert under North Bend Way. Data collection here is important to identify potential issues of pollution caused from runoff coming from upstream development and North Bend Way.

Sample site **A6** is below where the outflow from the lower detention pond enters stream A. It can show any contributions to water quality from the lower detention pond. The site is right after the stream leaves the Reservation and can show how water quality has changed moving through the Reservation.

Site **B7x** is at the mouth of a culvert, just before Stream B exits the Reservation, and after it has traveled through the Reservation.

Sample site **C8** is located in the southeast corner of the reservation just north of North Bend Way. Like site A1, site C8 is in a stream that flows through a culvert under North Bend Way. This site will help to identify any runoff issues coming from North Bend Way or upstream development. Site C8 is located furthest upstream on Stream B.

Site **P1** is in the Casino's main retention pond. Comparing data from this site with data from Stream A both above and below the point that the pond flows into the stream helps to identify if and how the pond is contributing to water quality in the stream. This site will help to determine if the floating treatment wetlands in the stormwater pond reduce 6PPD-q.

Sample site **CB1** (collection basin), is a storm drain in the casino parking lot. This is the storm drain in the parking lot above the employee parking lot just to the east of the driveway up the hill. This site can help determine the quality of the stormwater before entering the remainder of the system that eventually flows into the streams.

Sample site **PLC** (parking lot collector) is the stormwater feature that collects and filters the stormwater off the employee parking lot on the north end of the reservation through an LID (bioswale) design. This site helps assess how effective the bioswale feature is at filtering runoff before entering the natural system.

Sample site **BAS** (basket) is a rock gabion feature that slows and may provide some filtering of water drained from P1. Water flows out of the pond into the basket and down into the natural stream. Sampling here helps assess how well the pond is being filtered. This site will help to determine if the floating treatment wetlands in the stormwater pond reduce 6PPD-q.

Samples will be collected according to established methods and accompanied with a chain of custody form to Manchester Environmental Laboratory to be analyzed for 6PPD-q. Rainfall data will be checked after sampling and recorded in the notes section of the chain of custody form. Our storm criteria for 6PPD-q sampling is described below (Table 2).

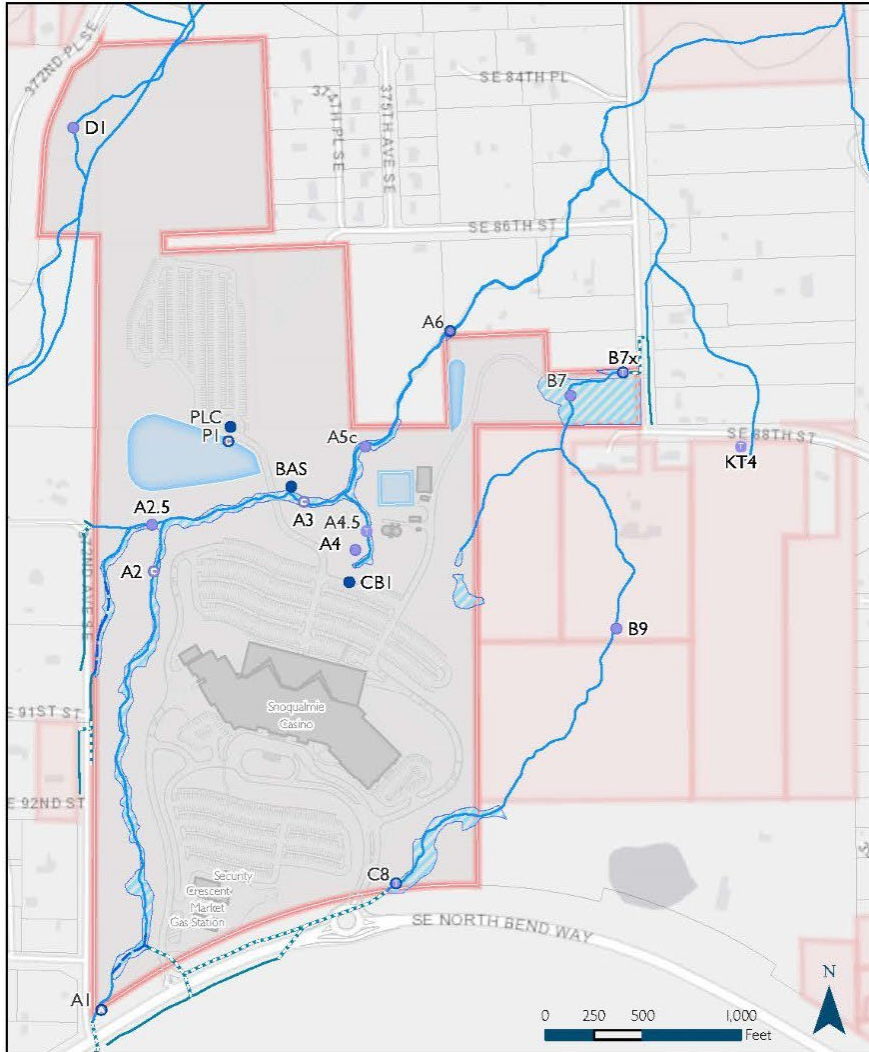
Table 2. Determination of rain events for 6PPD-q sampling

Rain Event Considerations	Quantitative
<b>Minimum Amount of Rainfall</b>	> 0.2 inches, no maximum
<b>Rainfall Duration</b>	1 hour minimum
<b>Sampling Period</b>	One sample at the beginning of storm event (within 4 hours) and following sample (within 4 hours of initial sample).

Sampling design was used based on previous sampling locations from the Snoqualmie Indian Tribe Water Quality Program QAPP. They were chosen to highlight water quality issues surrounding the stormwater pond and direct parking lot runoff, and to study the effects of BMP stormwater runoff treatment systems such as the lower parking lot bioswales. The number of samples chosen for each site was selected to increase the chance of finding 6PPD in stormwater, while remaining within budget constraints.



## SNOQUALMIE INDIAN TRIBE RESERVATION WATER QUALITY TESTING SITES

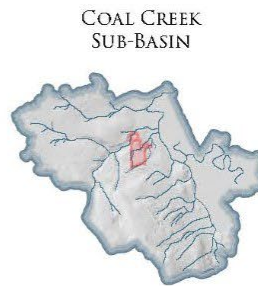


- King County Parcels
  - Trust lands
  - Fee Lands
  - Reservation Structures
  - EA Wetlands
  - Retention Pond
  - Fire Pond
- Reservation Streams**
- ditched channel
  - intermittent/undefined channel
  - piped channel
  - stream channel

**Water Quality Sites**

- Site Type, Logger
- 106, conductivity
  - 106, no logger
  - 106, water temp.
  - 106/319, conductivity
  - 106/319, no logger
  - 106/319, water temp.
  - 106/319, water temp. & air temp.
  - 319, no logger

- BAS – Basket
- CBI – Catchment Basin I
- PLC – Parking Lot Collector



Last Updated:  
3/14/2022 9:39 AM  
Path: Y:\GIS\_ENR\WQ\WaterQualityReservation\WaterQualityReservation2.aprx

Figure 1. Map of ENR Department sampling sites. Sites marked 319 will be sampled for 6PPD-q.



## Sampling Methods

We will use standardized sampling procedures, equipment and analytical methodologies to ensure quality comparable data. We will ensure that all supplies and consumables are stocked and in working condition.

Manchester Environmental Laboratory (MEL), Department of Ecology's accredited laboratory, will provide sample bottles. Each month, ENR staff will work with MEL staff to create a work order with the expected number of samples. Sixteen (16) samples will be collected for each rain event, two samples for each site. The first sample will be taken within four hours of the start of a rain event and the second sample will be taken within 4 hours from the start of the first sample. The work orders can be changed or cancelled depending on the weather conditions. After the work order is created, sample bottles can either be delivered by mail or picked up from MEL's storage locker in Tukwila, at least one day before sampling.

ENR staff will monitor weather conditions often and collect samples within 4 hours of the start of a rain event. Staff will notify the lab as soon as possible once a sample day is chosen to give them time to prepare and receive samples.

Before leaving for the field, ensure all materials have been assembled for sampling. Needed is a large cooler, ice to keep the samples cool, double bagged sampling bottles, backpack, bottle labels, pens, hammer, and a hand towel. Fill out the chain of custody form and as many of the bottle labels as you can, but do not adhere to the sample bottles yet. Samplers will wear powder free nitrile gloves and take samples using a sampling pole.

At each site, be careful not to disturb the substrate. Pour water into the bottle leaving no headspace. At site A1, sample directly out of the culvert, at site CB1 remove the grate using the hammer to access the water. Record the sampling time on the labels, dry the bottles with the hand towel, and adhere labels to each sampling bottle. Either fill out the times on the chain of custody form during sampling or take pictures of labels to fill out later. Cool samples on ice as soon as they are collected. Use plastic bags to double bag the sample bottles so melted ice doesn't dilute and contaminate the samples, especially on hot days.

After all samples have been loaded, finish filling out the chain of custody form and deliver samples and form to MEL's locker in Tukwila as soon as possible. Retain a copy of the chain of custody form for the Tribe's records. Adhere chain of custody seals to the cooler to for MEL staff to remove on arrival.

Washington Department of Ecology's Manchester Environmental Laboratory provides accurate, credible, and defensible analyses using the latest accredited methods. The lab will provide a report detailing the findings after analyzing the samples. MEL will dispose of samples following Washington Department of Ecology standards.

## Quality Control Requirements

Sample bottles for tire contaminants are amber glass to avoid photodegradation. 6PPD-q also attaches easily to many plastics, so glass bottles are recommended to minimize the loss of 6PPD-q. The bottles are extra clean but not treated. There are no storage requirements for unfilled bottles except keeping the lid on to prevent contamination. Minimal headspace should be left to prevent 6PPD and 6PPD-q oxygenation reactions. Sample water must be kept cool at 6°C +/- 2°C. The sample hold time is 14 days, deliver to the lab as soon as possible. If issues arise and the quality of sampling or laboratory analysis is suspected, the results of sampling may be removed from the dataset.

## Data Management

The Tribe will retain one copy of the chain of custody form for their records. This will have information on sample date, sample times, field crew, locations. Information about the rain event will be recorded in the notes section of the form. All chain of custody forms will be scanned in and stored on the ENR server for records retention.

After analysis MEL will produce a report consisting of a case narrative, analytical results, applicable quality control summary reports, and chain of custody. Data from this report will be entered into EPA's Water Quality Exchange (WQX) database. This data is co-owned by the Tribe.

## Audits and Reports

There will be regular review of all data collection, equipment, and data management techniques to ensure the data is collected conscientiously and carefully. Project supervisors have the authority to institute any necessary changes to bring the program into compliance. The progress report due on November 15, 2025 will describe success in meeting the project planning milestones, and alternative plans as needed.

The Tribe will produce a final report describing the results of this study and will present results to relevant audiences (Tribal Council, Ecology). The final report should include key details including but not limited to: 6PPD-q lab analyses, traffic density of the Snoqualmie Casino parking lot and North Bend Way, upstream development activities, vegetation species in the swale and floating wetlands, and additional characteristics of BMPs. The Tribe will produce a presentation to the Stormwater Work Group 6PPD Subgroup and an additional audience of their choice. Options for the additional audience include but are not limited to: Affiliated Tribes of Northwest Indians, Northwest Indian Fisheries Coordinated Tribal Water Quality Program, or MuniCon.

## Data Quality Assessment

The lab report will be reviewed at time of delivery. It will be reviewed before submitting to WQX, validated data will be periodically reviewed as it is entered. Any outliers and anomalies will be evaluated to ensure a data entry error has not occurred.

Department of Ecology team experts will assist with data analysis and statistics. The final report will include discussion of any data quality problems. Peer-reviewed literature will be requested on an as-needed basis.

## Budget

Table 3. Budget by item description

Budget Item Description	Computation		Quantity	Total Cost
	\$/Unit	Quantity	Type	
<b>Personnel</b>				
ENR Director	67.87	40	hours	\$2,714.80
Water Quality Manager	55.28	160	hours	\$8,844.80
Water Quality Assistant	27	80	hours	\$2,160.00
Field Staff	31	80	hours	\$2,480.00
GIS Manager	53.40	40	hours	\$2,136.00
<b>Personnel Subtotal</b>				<b>\$18,335.60</b>
<b>Fringe</b>				
Fringe benefits calculated @ 35% of salaries and wage (Retirement, Health Care, Annual and Sick Leave, Life Insurance, FICA)	0.35	400	hours	\$6,417.46
<b>Fringe Subtotal</b>				<b>\$6,417.46</b>
<b>Travel</b>				
Mileage	0.65	200	miles	\$130.00
<b>Travel Subtotal</b>				<b>\$130.00</b>
<b>Supplies</b>				
Ice and/or ice packs	\$31.25	8	unit	\$250.00
<b>Supplies Subtotal</b>				<b>\$250.00</b>
<b>Contractual</b>				
Shipping	\$300	8	N/A	\$2,400.00
Water quality laboratory analysis	\$700	64	Sample	\$44,800.00
<b>Contractual Subtotal</b>				<b>\$47,200.00</b>
<b>Total</b>				<b>\$72,333.06</b>

**Personnel:** Time for ENR Director, Cindy Spiry, to administer the funding, set up contracts, etc. Water Quality Manager, Kelsey Payne, would lead sample collection, shipping samples, receiving and interpreting reports, write final deliverable report to submit to Ecology and Tribal Council, and present on findings to Ecology staff and Tribal Council. Also includes time for the new Water

Quality Assistant and one other field staff (likely rotating) to participate in field sampling. The GIS Manager, Andrew McAninch assists with data uploads, quality control, and data storage, management, and analysis.

**Fringe:** Covers benefits for tribe staff, calculated at 35% of salaries and wage.

**Travel:** Reimbursement mileage for travel to and from sampling sites and sample drop-off locations.

**Supplies:** This small sum will cover the cost of cooling samples with ice or ice packs.

**Contractual:** Includes all costs of contract with Manchester Environmental Lab to analyze and report on 6PPD testing. Shipping to the laboratory is included as a separate line item.

Table 4. Budget by task

Task	Description	Amount
1	Project Management	\$6,650.10
2	QAPP Revision	\$2,238.84
3	Field Work	\$15,247.84
4	Laboratory Analysis	\$47,450
5	Communications	\$746.28
	<b>Total Project Cost</b>	<b>\$72,333.06</b>



Matrix Codes		Source Codes		Source Codes	
Code	Description	Code	Description	Code	Description
10	Water	00	Unspecified Source	60	Air (General)
40	Soil/Sediment	01	Unknown Liquid Media (Drum/Tank)	61	Ambient Air
70	Tissue	02	Unknown Liquid Media (Spill Area)	62	Source or Effluent Air
80	Oil/Solvent	03	Unknown Liquid Media (Waste Pond)	63	Industrial or Workroom Air
90	Waste				
00	Other (use only if no others apply)	10	<b>Water (General)</b>	70	<b>Tissue (General)</b>
CP	Consumer Product	12	Ambient Stream/River	71	Fish Tissue
		13	Lake Reservoir	72	Shellfish Tissue
		14	Estuary/Ocean	73	Bird Tissue
		15	Spring/Seepage	74	Mammal Tissue
		16	Rain	75	Macroinvertebrate
		17	Surface Runoff/Pond (general)	76	Algae
		18	Irrigation Canal/Return Flow	77	Periphyton
				78	Plant/Vegetation
		20	<b>Well (General)</b>	80	<b>Oil/Solvent (General)</b>
		21	Well (Industrial/Agricultural)	81	Oil (Transformer/Capacitor)
		22	Well (Drinking Water Supply)	82	Oil/Solvent (Drum Tank)
		23	Well (Test/Observation)	83	Oil/Solvent (Spill Area)
		24	Drinking Water Intake	84	Oil/Solvent (Waste/Pond)
		25	Drinking Water (At Tap)		
		30	<b>Effluent Wastewater (General)</b>	CP	<b>Consumer Product</b>
		31	Municipal Effluent	PU	Polyurethane Foam (PUF)
		32	Municipal Inplant Waters	FO	Foam
		33	Industrial Surface Runoff/Leachate	PL	Plastic
		34	Industrial Effluent	MT	Metals
		35	Industrial Inplant Waters	FA	Fabric
		36	Industrial Surface Runoff/Pond	PV	PVC
		37	Industrial Waste Pond	GL	Glass
		38	Landfill Runoff/Pond/Leachate	LQ	Liquid
		40	<b>Sediment (General)</b>	BA	Batting
		42	Bottom Sediment or Deposit	MI	Misc.
		44	Sludge (General)	SO	Solids
		45	Sludge (Waste Pond)	FM	Friction Materials
		46	Sludge (Drum/Tank)	PC	Personal Care Products
		48	Soil (General)		
		49	Soil (Spill/Contaminated Area)		
		50	Bore Hole Material		

Figure 2. Chain of custody form provided by MEL with matrix and source codes.



### Pre-Sampling Notification Form

Email to: Nancy Rosenbower – Project Coordinator  
[nros461@ecv.wa.gov](mailto:nros461@ecv.wa.gov) Phone: (360) 328-9308

Project Name: \_\_\_\_\_ MIC: \_\_\_\_\_  Enforcement  
 Project Manager: \_\_\_\_\_ Sampling Date(s): \_\_\_\_\_  Monitoring  
 Program: \_\_\_\_\_ Date to Lab: \_\_\_\_\_  Emergency  
 Phone No.: \_\_\_\_\_ Sample Pickup Location: \_\_\_\_\_  Class II  
 Date results needed by: \_\_\_\_\_ EIM Study ID (if available) \_\_\_\_\_  Preliminary Invest  
 Requested By: \_\_\_\_\_  Special turnaround

General Chemistry	W	S	O	Microbiology	W	S	O	Organic Chemistry	W	S	O
Alkalinity				Fecal Coliforms <input type="checkbox"/> MF <input type="checkbox"/> MPN				Base/Neutral/Acids (BNA)			
Conductivity				E. Coli MF				Polynuclear Aromatics (PAH)			
Hardness				E. Coli MPN							
pH				Enterococcus				Volatile Organic Analysis (VOA)			
Turbidity								BTEX			
<input type="checkbox"/> Fluoride <input type="checkbox"/> Chloride <input type="checkbox"/> Sulfate								Pest/PCBs (Organochlorine)			
Cyanide <input type="checkbox"/> Total <input type="checkbox"/> Dissociable				<b>Metals</b>	W <sub>t</sub>	W <sub>d</sub>	S	O	Pesticides only (Organochlorine)		
Total Solids				Priority Pollutant Metals (12 elements plus Hg)					PCBs only		
Total Nonvolatile Solids (TNVS)				TCLP metals					OP - Pests (Organophosphorous)		
Total Suspended Solids (TSS)				Hardness					Herbicides (Chlorophenoxy)		
Total Nonvolatile Suspended Solids (TNVSS)									Nitrogen Pesticides		
Total Dissolved Solids (TDS)				Mercury (Hg) <input type="checkbox"/> Regular <input type="checkbox"/> Low Level					Organochlorine Pesticides by GCMS 8270		
Chlorophyll <input type="checkbox"/> Filtered in field <input type="checkbox"/> Filtered at lab				Other: List individual elements below:					PBDEs		
% Solids									Hydrocarbon ID (match to source)		
% Volatile Solids (TVS)									HCID (gas/diesel/oil)		
Total Organic Carbon									TPH-D <sub>x</sub>		
Dissolved Organic Carbon									TPH-G <sub>x</sub>		
Biochemical Oxygen Demand (BOD) 5 day									PFAS		
BOD (5 day) –Inhibited											
BOD - Ultimate											
Ammonia											
Nitrate-Nitrite											
Orthophosphate											
Total Phosphorous											

Comments: \_\_\_\_\_ Enter the number of samples in the appropriate box(es) above W = water S = soil/sediment O = other (please specify)  
 W<sub>t</sub> = water total W<sub>d</sub> = water dissolved

Figure 3. Pre-sampling notification form provided by MEL, to be emailed to Nancy Rosenbower before sampling begins.





### Sample Container Request Form

Please email form to: [lwei461@ecy.wa.gov](mailto:lwei461@ecy.wa.gov)  
 Contact: Leon Weiks, Environmental Specialist 3  
 Phone: (360) 871-8825 Fax: (360) 871-8850

Please allow about 2 weeks for typical requests; longer for special requests

Requestor: \_\_\_\_\_

Project Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Today's Date: \_\_\_\_\_

Location for Delivery: \_\_\_\_\_

Date Needed by: \_\_\_\_\_

Index #	Description	Qty.
1	1 gallon jar WM, CLR (BNA)	
2	1/2 gallon jar WM, CLR	
3	1 liter jar WM, CLR (Organics) for HCID only, no preservative	
4	1 liter jar NM, CLR w/ 1:1 HCl 15mL dropper bottle included (Oil & Grease)	
7	16 oz short jar WM, CLR	
5	8 oz short jar WM, CLR	
8	4 oz short jar WM, CLR	
34	2 oz short jar WM, CLR	
13	2 oz short jar WM, CLR, w/septum	
11	40mL vial AMB w/septum <input type="checkbox"/> pre-preserved with HCl <input type="checkbox"/> dropper bottle of HCl <input type="checkbox"/> ascorbic acid for chlorinated VOA samples	
14	20mL vial w/acetic acid (Carbamates)	
39	1 liter glass NM, AMB (TPH-D) w/1:1 HCl	
15	1 liter glass NM, AMB (All other Organics)	
16	500mL HDPE bottle w/5mL 1:1 nitric acid (Metals including standard level mercury)	
17	1 gallon cubitainer LDPE (BOD)	
19	125mL Nalgene HDPE WM, CLR w/1:1 sulfuric acid (Nutrients or COD)	
20	125mL Nalgene HDPE WM, AMB (filters and syringe also required for orthophosphate)	
21	125mL Nalgene HDPE NM, CLR (Hardness) w/ 1:1 sulfuric acid <i>Hexachrome request w/o acid</i>	

Index #	Description	Qty.
22	500mL Nalgene HDPE WM, CLR (General Chem.)	
23	1000mL Nalgene HDPE WM, CLR (TSS)	
24	1000mL Nalgene HDPE WM, AMB (Chlorophyll)	
25	250mL HDPE NM, AMB (Cyanide)	
26	125mL Nalgene HDPE WM, CLR w/ 1:1 hydrochloric acid (TOC/DOC or TP) <input type="checkbox"/> Filters and syringe for DOC	
27	250mL poly WM, CLR (Fecal Coli)	
28	500mL poly WM, CLR (Multiple Micro Tests)	
29	250mL poly WM, CLR w/thiosulfate (Fecal Coliform - Chlorinated)	
30	500mL poly WM, CLR w/thiosulfate (Multiple Micro Tests - Chlorinated)	
31	8oz plastic jar HDPE (Grain size only)	
32	1 liter jar WM, CLR w/sulfuric acid (Phenolics)	
33	4oz sterile specimen cup (Micro - sediment)	
35	Soil VOA/BTEX Airtight Sampling Capsules (3 per sample)	
36	Soil VOA/BTEX Sampling Handle (1 per sampling event)	
37	500mL Teflon NM, CLR (LL Hg ONLY, w/gloves) <input type="checkbox"/> Total, Recoverable - no filter, preserved at lab <input type="checkbox"/> Dissolved with filter #38, preserved at lab <input type="checkbox"/> Field Blank Teflon NM w/LL and w/gloves	
38	Nalgene Metals Filters 0.45um for either #16 or #37	
40	PFAS CapSure Oblong HDPE WM 250mL <input type="checkbox"/> 500mL <input type="checkbox"/>	
Other Supplies		

All containers for organics are organic free with Teflon lined lids  
 WM = Wide Mouth    NM = Narrow Mouth    CLR = Clear    AMB = Amber

Alternate Supply Contact: Brodey Ristine – [BROS461@ecy.wa.gov](mailto:BROS461@ecy.wa.gov)

Figure 4. Sample container request form.

### Analytical Method Details - Ecology Manchester Environmental Laboratory

Method	Analyte	MDL	MR L	Units	Surr. %R	DUP RPD %R	Matrix Spike RPD %R	Blank Spike RPD	CAS #	
<b>Organics</b>										
<b>in Water</b>										
EPA1634	6PPD-quinone	0.480	2.00	ng/L	-	40	50-150	40	70-130	2754428-18-5
EPA1634	13C6-6PPD-Quinone			Surrogate	25-200	-	-	-	-	
EPA1634	D5-6PPD-quinone			ng/L	-	-	-	-	-	

Figure 5. Laboratory analytical methods for 6PPD-q.

## Appendix B. Glossary, Acronyms, and Abbreviations

### Glossary

**Nonpoint source:** Pollution that enters any waters of the state from any dispersed land-based or water-based activities, including but not limited to atmospheric deposition, surface-water runoff from agricultural lands, urban areas, or forest lands, subsurface or underground sources, or discharges from boats or marine vessels not otherwise regulated under the NPDES program. Generally, any unconfined and diffuse source of contamination. Legally, any source of water pollution that does not meet the legal definition of “point source” in section 502(14) of the Clean Water Act.

**Point source:** Source of pollution that discharges at a specific location from pipes, outfalls, and conveyance channels to a surface water. Examples of point source discharges include municipal wastewater treatment plants, municipal stormwater systems, industrial waste treatment facilities, and construction sites where more than 5 acres of land have been cleared.

**Pollution:** Contamination or other alteration of the physical, chemical, or biological properties of any waters of the state. This includes change in temperature, taste, color, turbidity, or odor of the waters. It also includes discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state. This definition assumes that these changes will, or are likely to, create a nuisance or render such waters harmful, detrimental, or injurious to (1) public health, safety, or welfare, or (2) domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or (3) livestock, wild animals, birds, fish, or other aquatic life.

**Stormwater:** The portion of precipitation that does not naturally percolate into the ground or evaporate but instead runs off roads, pavement, and roofs during rainfall or snow melt. Stormwater can also come from hard or saturated grass surfaces such as lawns, pastures, playfields, and from gravel roads and parking lots.

### Acronyms and Abbreviations

BMP	Best management practice
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
GIS	Geographic Information System software
MEL	Manchester Environmental Laboratory
QA	Quality assurance
QC	Quality control
SOP	Standard operating procedures