Monitoring Protocols for Ferry Terminal Routine Maintenance: Cleaning and Washing Marine Growth, Preparatory Cleaning, and Washing and Painting Below OHWM

The protocols originally contained in "*Ferry Transfer Span and Associated Over-Water Metal Structures (includes the tower, overhead walkways, wingwalls, and dolphins), Routine Maintenance Cleaning and Washing Marine Growth Removal*" were developed for Washington State Department of Transportation (WSDOT) to conduct monitoring of wash water and receiving water associated with the maintenance of ferry terminal metal structures and monitoring associated with the maintenance of ferry terminal metal structures above the Ordinary High Water Mark (OHWM). Edits have been made to the text of the original protocols to make them applicable for use by WSDOT when conducting maintenance activities covered under the Bridge and Ferry Terminal Washing General Permit (Permit).

Ferry Terminal Routine Maintenance Cleaning and Preparatory Washing Monitoring Protocols (July 2020)

Background

Cleaning of metal components of the ferry terminal transfer spans in Washington State is done to allow for routine visual inspection, maintain structural integrity, and to remove unpleasing substances from the general public. The protocols described here cover the washing for structures above the OHWM that will have discharges to the water. Activities within full containment with no discharges are not covered under these protocols.

The water generated during the washing process that comes into contact with paint and accumulated debris (dirt, moss, sediments, bird nests and associated fecal material, marine growth, etc.) on the structures can pick up contaminants that have the potential to affect the quality of receiving waters.

1. Monitoring Procedures

In general, the preparatory washing and maintenance washing follow the same sampling and analysis protocols. However, the preparatory washing activity typically uses high pressure washers and involves the use of #100 sieve filter fabric tarp to primarily capture paint particles coming off the structures being washed. Therefore, samples of the discharge are taken after the wash water filters through the filter fabric tarp. The two types of washing activities are described below.

Ferry Terminal <u>Preparatory Washing</u> for Painting Structures

The basic procedure for washing and re-painting a transfer span and associated structures is to:

- Walk and select a section of the transfer span/structure to prepare for preparatory washing and painting:
- Use dry cleaning methods first to remove debris and paint chips,
- Plug all drains
- Wash transfer span structures with pressure washers during the maximum daily tidal flow,
- If sandblasting is performed, it would require full containment.
- Apply primer and paint.

Wash water is generated when the transfer span is pressure washed after completing the dry cleaning. Wash water flows on and filters through the tarp, eventually discharging to the area under the transfer span. As will be described below, any samples collected will be used to characterize the filtered discharge water resulting from the cleaning process.

Once completed, the tarp is moved to a different section of the transfer span and the procedure is repeated.

Ferry Terminal <u>Routine Maintenance Washing</u> of Structures

The basic procedure for washing and re-painting a transfer span and associated structures is to:

- Walk and select a section of the transfer span/structure to prepare for preparatory washing and painting:
- Use dry cleaning methods first to remove debris and paint chips,
- Plug all drains
- Wash transfer span structures with high flow-low pressure water during the maximum daily tidal flow.

Wash water is generated when the transfer span is high flow, low- pressure washed after completing the dry cleaning. Wash water discharges to the area under the transfer span. As will be described below, any samples collected will be used to characterize the discharge water resulting from the washing process.

The time to clean and paint each section is a function of the size of the area that is being worked on. However, maintenance flushing of a section of a transfer span typically is completed in a single day. Therefore, this sampling protocol is designed to be completed in one day (or night).

The methods used to collect samples of wash water will be somewhat specific to the transfer span being cleaned and washed. The basic procedure is to collect samples from three different locations under the filter tarp.

Wash water will usually discharge in a single stream through low or depressed areas of the transfer span being cleaned. It is in these areas where wash water will be collected for sampling.

Hang a five gallon bucket to collect the wash water to take the samples. The hanging and sampling collections areas are the ferry terminal and under areas of the transfer span and associated structures that will be washed with a significant amount of water. Water from the buckets will be used to fill sample bottles.

One potential difficulty related to this sampling method is that a boat or temporary work platform may be necessary to collect samples of wash water and/or grab samples of the receiving water. If a boat or work platform is needed, additional project coordination will be necessary. For instance, if a boat is used, additional logistics such as procuring a boat, finding a place to launch it, navigating the boat to the desired location, and securing the boat in one spot long enough to collect a composite sample will have to be considered.

Grab samples of the receiving water (background) should also be collected 100 to 200 feet "up current" of the project area to assess for background concentrations. Care should be taken not to collect background samples in areas where there are discharges from culverts or drains as these areas may have high concentrations of metals. If taking the sample 'up current" is not possible, the sample may be taken off to the sides of where the structure was painted as long as this location is outside the area of influence from washing activities. The location where the background sample is collected should be documented and included in the report.

The grab samples can be collected directly from the receiving water using a "dip-and-take" method (see Sample Collection Section below) from the terminal or from a boat. If using a motorized boat, care should be taken that the sample is not collected down current of the boat motor.

The labeled sample bottles should be delivered to a state accredited laboratory (lab) for analysis.

The wash water composite samples will be analyzed for total and dissolved copper, lead, and zinc.

Field Preparation
Please coordinate with the lab beforehand that will perform the testing to insure the amount of volume required is collected and whether or not the samples need to be preserved or filtered in the field.

A. Order supplies from the lab. The lab will need to be the state lab or on the Washington State list of vendors. Be clear with the lab on what you are sampling for at each sampling location. The lab will need to provide the appropriate sample containers and that may include (assumes three sample locations from the transfer span, one from the receiving water, and one extra bottle for backup/field duplicate):
    1. Five (5) - 500 ml containers preserved with HNO_3 (preservative only necessary if lab requires for testing).
    2. Five (5) - 500 ml containers without any preservative.
    3. Labels for bottles
    4. Chain of custody form.
    5. Filtering system, if lab requires certain samples filtered in the field.

B. Collect the following equipment:

1. Four (4) clean or decontaminated five-gallon buckets with lids and handles
2. Field notebook and monitoring form (see attached example)
3. Camera
4. Sharpie/pencils
5. Pre-labeled sample bottles
6. Small decontaminated funnel or bailer(s) for filling containers and sample bottles
7. Dilute (10%) HCl or phosphate free cleaner (like equinox) in a squirt or dispensing bottle for container washing.
8. Deionized distilled water in a squirt or dispensing bottle for container rinsing.
6. Coolers with ice (if lab requires a certain holding temperature) Bubble wrap (to ensure that bottles do not break and writing on labels do not smear)
7. Safety equipment (nitrile gloves (change between each sample collection point), goggles or protective eye great, reflective raingear, hardhat, earplugs, work boots, flashlight, personal flotation device if applicable)

C. Put on safety goggle and gloves, and rinse sample buckets with a cleaning solution like 10% HCl solution or phosphate-free cleaning solution (like equinox), and then rinse with deionized water, and cover with plastic lids or something similar to prevent outside contamination from entering the buckets. (Note: Use new buckets or clean and scrub the buckets with soap and hot water before applying the 10% HCl solution or phosphate-free cleaner to use between collection points). The rinsate may be disposed of in a sink or upland location on a project site.

D. Sample containers should be organized and labeled. It may benefit the project if you determine if the lab has a preference of how the sample containers should be labeled (for example, Kingston Ferry Terminal (KFT), Site #1, date, time, analytes). Sample containers should also be labeled with unique id numbers as well as the timing and location of the sample.

E. Call the lab and coordinate sample pick-up or delivery.

Sample Collection
The following procedure should be implemented during transfer span paint prep activities:

<u>Background (Receiving water)</u>

A. Collect a grab sample from the receiving water from an "up current" location. Select a location 100 to 200 feet "up current" of the transfer span, and away from the shoreline where any culverts or outfalls may be located for collecting samples from the receiving water. This sample should be collected prior to on the same day that the wash water collection is being performed.
B. If a boat is used or the receiving water is "wadeable", use a "dip-and-take" method to directly fill each sample bottle. Using this method, simply submerge the sample bottle below the surface of the water until the bottle is full. If in a boat with a motor, do not collect your sample downstream of the motor.

<u>Wash Water</u>

A. Select three distinct sampling locations under the filter tarp along the section of the transfer span and associated structures being rinsed/washed. They should be in areas likely to receive a significant amount of wash water (e.g. directly under vertical support structures or in areas with heavy buildup of debris), and where high volumes of water would be expected to flow. Depending on where pressure washing is being conducted, it may be necessary to use a boat or temporary work platform to collect samples.
B. Use a clean or decontaminated bucket to collect discharge water. This is done by placing or holding the bucket under the discharge stream. If necessary, fill the bucket again with effluent discharge for filling the sample bottles to test for the other analytes.
C. Use buckets to collect discharge from two additional distinct locations of the washing activity and follow the process outlined above.
D. Use a clean bailer or a decontaminated pouring container to fill sample bottles at each location.
E. Complete all fields on chain of custody.

Sample Preparation

Verify with the lab performing the analysis the actual quantities of effluent needed for collection to perform each of the tests. Also verify with the lab whether any samples need to be filtered in the field, or placed in containers with preservatives. These requirements are typically dependent on how long it will take to deliver the samples to the lab for processing.

Please verify with the lab on container requirements, supplies, holding times, and how the samples will be delivered to the lab. The following lists are what a typical lab may require. . :

<u>Receiving Water</u>

A. One (1) container preserved with H_2SO_4 (for hardness). Preservative only necessary if lab requires for testing.
B. One (1) container with no preservative (for dissolved copper, lead, and zinc). Filtering of water only necessary if lab requires for testing.
C. One (1) 500 ml container preserved with HNO3 (for total copper, lead, and zinc). Preservative only necessary if lab requires for testing.
D. Wrap sample containers in bubble wrap.
E. Fill out label with unique id, sample time, sample date
F. Fill out a chain-of-custody form.
G. Ship sample containers and chain-of-custody form to lab.
H. Record additional notes, observations, etc.

<u>Wash Water</u>

A. Ensure you have a clean pair of nitrile gloves for each sample location
B. Select the 1st sample bucket collected from the wash water (after passing through the #100 sieve tarp) and swirl gently to ensure sample is well-mixed
C. Using a small funnel, bailer, or stainless steel pour container, carefully transfer water from the bucket into the sample bottles. Fill to approximately the "shoulder" of the sample bottle. Fill pre-labeled sample containers as follows:
    1. One distinct (1) 500 ml container with no preservative (for dissolved copper, lead, and zinc)

2. One distinct (1) 500 ml bottle preserved with HNO_3, if required by lab for total copper, lead, and zinc. .

D. Repeat above steps for the remaining samples, including water collected from the receiving water at a location 100' to 200' from the painting location.
E. An additional set of sample bottles are filled from one of the composite samples. These will serve as a field duplicates.
F. Wrap samples in bubble wrap or pack to ensure they will not be damaged or smear the labels.
G. Fill out a chain-of-custody form.
H. Ship or deliver cooler(s) and sample containers to the lab. Include chain-of-custody form.

2. Painting Below the OHWM

The basic procedure for painting below the OHWM is to select the area and:

- Install a full containment system around the area to be cleaned and painted,
- Use dry cleaning methods or abrasive blasting to remove debris and paint chips,
- Apply primer and/or paint.

This permit will not be used for any sampling within a full containment system.

3. Lab Procedures For All Testing

Analytical parameters and methods, detection limits, preservation methods, and holding times for samples collected during monitoring are summarized in Table 1. The laboratory selected must be registered or accredited under the provisions of, Accreditation of Environmental Laboratories, Chapter 173-50 WAC. The lab will also be responsible for internal QA checks.

TABLE 1. PARAMETERS AND SAMPLE ANALYTICAL METHODS.

Parameter	Method Type	Method Number	Detection Limit(1)	Holding Time
Total and Dissolved Copper Wash Water & Receiving Water	ICP/Mass Spectrometry	200.8(3)	1.0 µg/L	6 months
Total and Dissolved Lead Wash water & Receiving Water			0.5 µg/L	
Total and Dissolved Zinc Wash Water & Receiving Water			2.5 µg/L	

(1) mg/L = milligrams/liter
µg/L = micrograms/liter
(2) APHA Standard Methods, 1992.
(3) U.S. Environmental Protection Agency (EPA) Publication EPA/600/R-94-111 as updated.
(4) Standard Method 2340B for total hardness.

4. Final Report for All Sampling Projects

Submit monitoring report, including test results, to the Statewide Permit Coordinator at ESO upon completion of the monitoring effort. The Statewide Permit Coordinator will be responsible for submitting the report to the Department of Ecology per permit requirements in sections S5 and S8. These requirements include the following:

- The date, including year, and time of day samples were collected
- The location where the samples were collected (both effluent and background samples)
- The total volume of water discharged to surface waters, reported in gallons
- The number of hours spent actually washing the structure
- The specific detection limits provided to the lab for analysis (provided in table above)
- Copies of any field notes

Consider taking photographs of the work area, BMPs used including sieve tarp preparatory washing being performed, monitoring being performed, etc. Copy of the final spill prevention, control, and countermeasures plan can be provided for bridge painting projects covered under this NPDES (per Section S3).

The attached monitoring form can be used in the field to insure all the necessary information is collected and documented.

FERRY TERMINAL PREPARATORY WASHING –MONITORING FORM

Ferry Terminal Name & Number:
Name of Waterbody:
County & WRIA:
Project Date (month and year):
Sampling Date(s) & Time of Day:
Number of pressure washer used:
Total number of man hours spent washing the ferry terminal:
Total volume of wash water discharged into the waterbody:
Receiving water (background) sample taken for: ☐ Copper – total & dissolved: ☐ Lead – total & dissolved: ☐ Zinc – total & dissolved: ☐ Hardness
Location where the receiving water sample was taken (include distance from the ferry terminal):
Effluent (wash water) samples taken for: ☐ Copper – total recoverable & dissolved: ☐ Lead – total recoverable & dissolved: ☐ Zinc – total recoverable & dissolved: ☐ Hardness
Locations where the effluent samples were taken:
Field notes taken? If YES, attach copy to Monitoring Report.
Is Lab(s) Accredited?
EPA Approved Methods for samples the Lab will use?
Detection limits requirements provided to lab?
NOTES: