

**WSDOT PROTOCOL
FOR
WASHWATER EFFLUENT DISPOSAL
TO UPLAND AREAS
FROM BRIDGE PAINT PREPARATORY WASHING
and BRIDGE MAINTENANCE WASHING ACTIVITIES**

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INTRODUCTION

On December 18, 2009 the Department of Ecology re- issued the Washington State Department of Transportation (WSDOT) a National Pollution Discharge Elimination System (NPDES) Wastewater Discharge Permit No. WA-00039039. This permit covers the wash water disposal for bridge and ferry terminal washing activities. Under Section S.1 A, B, and D, of the permit WSDOT is required to develop a plan or protocol describing the methods they will use to determine if discharging bridge washing effluent to ground is appropriate. When the permit was first issued April 3, 2004, WSDOT was authorized, through a compliance schedule, to discharge bridge washing effluent associated with bridge preparation for painting to ground provided WSDOT conducted a groundwater study to determine if effluent had the potential to violate groundwater standards. The study was required because of the potential need to discharge effluent to ground where discharge to surface waters was not allowed.

WSDOT hired John Lenth of Herrera Environmental Consultants, Inc. to prepare the report. The final report, titled ***WATER QUALITY IMPACT EVALUATION – Ground Disposal of Effluent from WSDOT Preparatory Bridge Washing, January 2008*** was submitted to Ecology that same month for review.. Based on information from that study, the new permit includes more restrictive criteria for discharging bridge washing effluent to the upland and dry stream bed areas. The new permit also expands the ground water discharge limitations to apply to bridge maintenance washing activities under S.1. A and B. WSDOT and Ecology agreed to develop a protocol to clarify how to implement the new ground water discharge limitations in the field for the three types of bridge washing activities. The following protocol captures multiple scenarios that occur for preparatory washing, maintenance washing and spot cleaning washing.

The permit covers three different activities for bridges and ferry terminals. The focus of this plan is on bridges.

(1) Factors to consider in Preparatory Washing – Bridge Painting:

- 303(d) listing for metals
- Surface Water flows at the time of washing
- Near shore area – boundary and existing condition
- Exposed area between the OHWM and actual flowing water

(2) Factors to consider in Maintenance Washing:

- 303(d) listing for metals
- Near shore area – boundary and existing condition
- Exposed area between OHWM and actual flowing water

(3) Spot Cleaning:

- 303(d) listing for metals
- Near shore area – boundary and existing condition
- Exposed area between OHWM and actual flowing water

BACKGROUND INFORMATION

PREPARATORY WASHING – BRIDGE PAINTING SCENARIOS

The groundwater study showed the dissolved metal concentrations in the bridge washing effluent for preparatory washing had the potential to violate groundwater standards. The study also developed criteria to use in determining if the effluent would result in a violation based on soil type, slope of

ground, and distance of sheet flows to infiltrate wash water. The study concluded that discharges to an upland area where the groundwater table was at least 1.5 feet below the surface didn't have the potential to impact ground water.

303(d) listing: If a project occurs over a water body that is 303(d) listed for any of the metals of concern (copper, lead, zinc) the permit does not allow discharge of the bridge effluent to surface waters. In this scenario, WSDOT could discharge all the wash water to ground. WSDOT would have to identify an area where the groundwater depth is at least 1.5 feet below ground or meets the criteria outlined in the groundwater study based on soil type, slope of the ground and distance water can sheet flow over the surface. In all cases, BMPs would be utilized, if necessary, to contain the water to this area to allow for infiltration and prevent the discharge from reaching the near shore areas (where groundwater is less than 1.5 feet to surface) or reaching any exposed area below the OHWM or reaching surface waters.

Sufficient Surface Flow: If a project occurs over a water body where the flows (CFS) are sufficient for a mixing zone as outlined in the NPDES permit Section D, then WSDOT will evaluate the areas underneath those portions of the bridge structure that are over land and determine if they can discharge in this location or not. The discharge to surface waters is allowed and discharge to ground where the depth to ground water is at or greater than 1.5 feet is also allowed or the protocol outlined in the report are followed to determine infiltration based on soils, slope, and sheet flow distance. Where the near shore area is soil but groundwater is within 1.5 feet of the surface, no discharge of wash water is allowed. For those areas, WSDOT would have to direct the discharge to identified upland locations where discharge to ground is allowed or direct the discharge directly to the surface waters where mixing can occur. If the near shore area is riprap or some other impermeable surface that traps and holds wash water, no discharge – direct discharge to identified areas where discharge to ground is allowed or direct discharge to surface waters. For any areas below the OHWM that are exposed, i.e. not covered with flowing water, no discharge – direct discharge to areas where discharge to ground is allowed or direct discharge to surface waters.

MAINTENANCE WASHING SCENARIOS:

The permit does not have flow restrictions of the receiving water body for maintenance washing, does not require the use of a permeable tarp to filter maintenance wash water and has a timing window for conducting maintenance washing. The boundary for the near shore area will have to be defined based on the ground water depth. WSDOT demonstrated from the data collected to date that dissolved metal concentrations in maintenance washing effluent do not have the potential to violate the groundwater standards, and is allowed to discharge to ground in the near shore area. However, WSDOT is still not allowed to discharge to exposed riverbed (areas between the OHWM and physical flow) where surface water quality standards apply which are more stringent than ground water standards and there is no mixing occurring in this area.

When discharging to the ground above the OHWL (referred to as upland area), there can be surface runoff traveling across the ground that could reach the river. In cases where there is no potential for violating groundwater standards, this runoff is allowed to discharge to the river provided there is no violation of the turbidity standards at the point of discharge. Visual monitoring the turbidity levels will be performed or BMPs will be used to control turbidity to ensure compliance with the standards. Overland runoff is not allowed to discharge to an area below the OHWM where there is no flow for reasons stated above.

If the maintenance wash water is shown to exceed groundwater standards, then over land discharge to the receiving water is not allowed. The discharge would have to be directed to areas of upland where

groundwater is at, or greater than, 1.5 feet below the surface or directly to the water body where water is flowing or discharged to flowing water.

303(d) listing: If maintenance washing occurs over a water body that is 303(d) listed for any of the metals of concern (copper, lead, and zinc) there can be no discharge of the bridge effluent to surface waters. In this scenario, WSDOT could discharge all the wash water to ground or capture and dispose of offsite. WSDOT must identify an area where the groundwater depth is at least 1.5 feet below ground or meets the soil type, ground slope, and sheet flow distance as outline in the *Ground Disposal of Effluent from WSDOT Preparatory Bridge Washing, January 2008*. If necessary, BMPs are employed to contain the water to this area to allow for infiltration and prevent the discharge from reaching near shore areas (where groundwater is less than 1.5 feet to surface) or reaching any exposed area below the OHWM or reaching surface waters.

SPOT CLEANING:

The groundwater plan or protocol developed for maintenance washing also applies to spot cleaning. However, it should be noted that the permit currently requires WSDOT to collect data on the volume of water used to conduct spot cleaning. At the end of the 5 year cycle, volume data can be compiled and compared to the maintenance wash volumes. If the data from maintenance washing shows that dissolved metal concentrations are not a concern and the volume of water used for maintenance washing is higher than spot cleaning, the same scenarios described under maintenance washing would apply here. Note that this activity also uses BMPs where WSDOT may utilize full containment of the discharge during washing activities.

303(d) listing: If a project occurs over a water body that is 303(d) listed for any of the metals of concern (copper, lead, and zinc) there can be no discharge of the bridge effluent to surface waters. In this scenario, WSDOT may consider discharging all the wash water to ground. To do so, WSDOT must identify an area where the groundwater depth is at 1.5 feet below ground or greater. They also have to employ BMPs that contain the water to this area to allow for infiltration and prevent the discharge from reaching near shore areas (where groundwater is less than 1.5 feet to surface) or reaching any exposed area below the OHWM or reaching surface waters.

Process for establishing if wash water effluents can be discharged to uplands

Preparatory Washing:

Preparatory Washing is typically done by a contractor. If this work is included in a contract, WSDOT will investigate the upland areas adjacent to the bridge structure to determine if ground disposal of the wash water meets the soil, slope, and distance requirements outlined in the *Ground Disposal of Effluent from WSDOT Preparatory Bridge Washing, January 2008* report. The pertinent portions of the report will be included in the contract specifications, including no discharge of effluent to impervious surfaces such as riprap adjacent to the waterbody and no discharge to the any portion of a dry bed. In lieu of following the soil, grade, and distance criteria for infiltration, WSDOT may elect to establish that the groundwater table is at least 1.5 feet below the surface where wash water would be deposited of in the upland areas. This is done through field verification by digging a series of holes where the water will be discharged. If no water is found standing in the hole after 30 minutes, then it is presumed the water table is deeper than 1.5 feet below the surface at that location. If standing water is visible in the bottom of the hole, another hole will be dug three feet up slope and process repeated until an upland area is found where the groundwater is deep enough for ground discharge of the wash water. In areas where riprap or other impervious services are under the structure or where the water level is below the OHWL exposing parts of the stream bed, tarps will be utilized

to direct the wash water to an acceptable upland area or directly into the receiving water. BMPs will be installed to contain surface runoff from reaching the riprap or the exposed stream bed.

Maintenance Washing and Spot Cleaning:

The bridge crew will review plans of the bridge structure to be washed to determine if part of the bridge is located outside the OHWL. If it is, they will field verify the ground water depth by digging a series of holes at least 1.5’ deep just up slope of the OHWL. If no water is found standing in the hole after 30 minutes, then it is presumed the water table is deeper that 1.5 below the surface at that location. If standing water is visible in the bottom of the hole, another hole will be dug three feet up slope and process repeated until it is established where the groundwater is deep enough for ground discharge of the wash water.

If the slope under the structure has been covered with an impervious material, such as a concrete slap or interconnected pavers, tarps will be installed to either direct the wash water into an acceptable upland area, or directly discharge the wash water into the waterbody.

If wash water is discharged to the upland above the impervious area, BMPs will be installed to contain the water and allow it infiltrate into the ground.

If at the time the bridge washing occurs the water level of the receiving water is below the ordinary high water line leaving an area of exposed bed, the same process used for riprap areas will be utilized.

If there is no impervious surface, and the water level is at, or above, the OHWL the wash water discharged to the upland area will be allowed to sheet flow into the water body. When this is done, the area where the water enters the water body will be visually monitored to insure no erosion is happening and there is no sediment discharge to the water. Appropriate BMPs will be installed, if necessary, to control erosion and sediments.

OVERLAND DISCHARGE OF MAINTENANCE WASH WATER

The data submitted to date on maintenance washing indicates that discharges to ground would not result in a violation of the groundwater standards. Table 1 shows the data collected on dissolved metal concentrations from four bridge washing projects. WSDOT proposes to continue discharge of maintenance wash water to ground for those portions of the structure that are located over upland areas. In addition to the data collected to date, this proposal is also based on the reasonable potential analysis completed by Ecology showing that past maintenance projects have not resulted in a violation of water quality standards. This proposal does not include discharging to impervious surfaces (such as riprap) in the near shore area, or exposed areas located below the OHWM. The practices described above for maintenance washing would still apply to 303(d) listed waterbodies and, on all projects, WSDOT would visually monitor any overland discharge to ensure no erosion is occurring. Appropriate BMPs will be installed if necessary to control erosion and sediments.

Table 1 : Maintenance Wash Data from 2000 to 2005

	I-5, Skookumchuck River 2004	US 101, Hoquiam River 2006	Interstate 5, Cowlitz River 2007	US 12, Wiskah River 2008	Ground Water Criterion
Dissolved Copper	.022 mg/L	.006 mg/L	.24 mg/L	ND mg/L	1.0 mg/L
Dissolved	.048 mg/L	.04 mg/L	.76 mg/L	ND mg/L	0.05

Lead					mg/L
Dissolved Zinc	3.20 mg/L	.06 mg/L	1.3 mg/L	ND mg/L	5.0 mg/L