

2017 Phase I NPDES Annual Report for City of Tacoma

Q.72 Attachment – Description of Any Stormwater Monitoring or Stormwater-related Studies

Thea Foss Stormwater Monitoring and Source Control Program

Under a Unilateral Administrative Order and a Consent Decree with EPA (CD), the City of Tacoma implements the Thea Foss Post-Remediation Source Control Strategy, a stormwater monitoring and source control program for the municipal storm drains entering the Thea Foss and Wheeler-Osgood Waterways.

The monitoring program component evaluates the quality of stormwater discharges to the Thea Foss Waterway and the effect of those discharges on sediment quality. The monitoring results are being used in an ongoing evaluation of source loadings to the waterway to help identify and manage new or existing sources and to protect sediment quality in the years following the sediment remedial action. Chemicals predicted to have the greatest potential to affect sediment quality in the years following cleanup action include polycyclic aromatic hydrocarbons (PAHs) and phthalates.

For the first ten years of the program (August 2001-September 2011), stormwater, baseflow and stormwater suspended particulate matter (SSPM) were sampled at seven outfalls that discharge into the Thea Foss Waterway. Baseflow samples were not taken after the tenth year since it was determined that baseflow had been well characterized; however, stormwater and SSPM were sampled during this monitoring period. In WY 2016, baseflow sampling was reinitiated in order to determine whether there had been any changes to the concentrations over time so that loadings could be updated as appropriate. To date, 1,735 samples have been collected: 347 baseflow, 1,006 stormwater, and 382 SSPM samples (92 outfall and 290 upland).

The whole-water samples are analyzed for target analytes selected from the list of problem chemicals identified in the CD, including selected semi-volatiles (PAHs and phthalates), selected metals (lead, mercury and zinc), conductivity, hardness, pH and TSS. The SSPM samples from the sediment traps and the sump were analyzed for the target analytes including semi-volatiles (PAHs and phthalates), total solids, grain size, TOC, selected metals (lead, zinc and mercury), PCBs and NWTPH-Dx.

Volunteer Stream Team Water Quality Monitoring

The Pierce Stream Team coordinated volunteers to collect water quality data for a selection of the following streams in Tacoma: Buckley Gulch Creek, Garfield Gulch, Crystal Springs Creek, Flett Creek, Mason Creek, Swan Creek, and Titlow Gulch Creek. Monitoring parameters include pH, dissolved oxygen, nitrate, temperature, and turbidity. Qualitative observations of water appearance, visible discharges, stream bed coating, odor, weather, debris, or wildlife are also documented. Monitoring frequency varies from monthly to quarterly.

Section S8.C – Stormwater Management Program Effectiveness Studies

The City of Tacoma selected Option #2 to fulfill the monitoring requirements for the Stormwater Management Program Effectiveness Study by conducting stormwater discharge monitoring at five locations, and end of pipe sediment monitoring at six locations in the Thea Foss Waterway,

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as a continuation of the stormwater monitoring conducted under Section S8.D of the 2007 Phase I Municipal Stormwater Permit. The Thea Foss and Wheeler-Osgood Waterways Stormwater Monitoring Quality Assurance Project Plan (QAPP) was approved by Ecology and EPA on August 28, 2014 for these monitoring locations. Monitoring was initiated October 1, 2014. The QAPP incorporates the requirements for both Section S8.C and the Consent Decree with EPA (CD) for the stormwater monitoring under the Thea Foss Post-Remediation Source Control Strategy. Additional constituents for stormwater monitoring required under the NPDES program include anionic surfactants, BOD, chloride, turbidity, cadmium, copper, select insecticides, select herbicides, select nutrients, total petroleum hydrocarbons, and fecal coliform. Additional constituents for sediment monitoring at the end of the pipe include total volatile solids, cadmium, copper, total phosphorus and bifenthrin.

Tacoma – UWT Washington State Department of Ecology Freshwater Algal Control Program Grant

In 2016, the City of Tacoma and the University of Washington-Tacoma (UWT) started a monitoring project performed under the 2016-2018 Water Quality Algae Control Program Grant (Agreement No. WQALG-2017-TacoES-00005 between the Washington State Department of Ecology and the City of Tacoma). The project is partially funded by the grant. The purpose of this project is to evaluate the performance of a non-proprietary treatment media that provides phosphorus removal from stormwater and surface waters utilizing Water Treatment Residuals (WTRs). WTRs have been shown to have the potential to remove phosphorus in stormwater and are a common byproduct of drinking water treatment. Drinking water is commonly treated using chemically-enhanced flocculation to remove solids and decrease turbidity. The resulting floc is removed through filtration, and the solids then are dewatered. The material remaining after dewatering is WTR, which then must be disposed of as a waste product by the water supply utility. Chemically-enhanced flocculation often utilizes iron or aluminum based additives, which have an affinity for phosphorus. This affinity for phosphorus is maintained in the resulting WTRs. In 2015, Tacoma Water opened a new water treatment facility located near the headwaters of the Green River. This facility produces hundreds of cubic yards of WTR annually. The study entails 1) constructing pilot-scale treatment facility utilizing WTRs obtained from the Tacoma Water Green River facility, 2) operating the facility for 12-15 months at a location on Wapato Lake, and 3) monitoring water quality to characterize phosphorus removal.