



CITY OF SEATTLE PUBLIC UTILITIES SOUTH THORNTON NATURAL DRAINAGE SYSTEM INSTALLATION

In December 2020, a Puget Sound stormwater science team, led by researchers at the University of Washington Tacoma and Washington State University Puyallup, identified the emerging contaminants 6PPD and 6PPD-quinone to be responsible for pre-spawn Coho salmon mortality in urban streams in Washington. Thornton Creek, a salmon-bearing urban creek located in Seattle, was one of the streams where these emerging contaminants were found. 6PPD is a widely used tire rubber antioxidant which prevents degradation of tires, and 6PPD-quinone is a transformation product that forms when 6PPD reacts with ozone in the air. The Washington State Department of Ecology with the help of the Washington State Department of Transportation, King County Flood Control District and other partners developed assessment and mitigation strategies for treatment infrastructure. This work also employed a watershed approach to locate areas vulnerable to 6PPD and 6PPD-quinone pollution based on indicators like salmon habitat distribution, traffic counts and land use.

Emerging Contaminants:
6PPD, 6PPD-quinone

Project Type:
*Nonpoint
Source/Stormwater
Pollution Prevention*

Seattle Public Utilities (SPU) applied for CWSRF base and emerging contaminants funding to support the South Thornton Natural Drainage System Project, which will construct 43 natural drainage systems (bioretention cells, a form of green infrastructure that can help to capture the first flush of pollutants from impermeable surfaces) along multiple residential blocks, targeting vulnerable areas within the Thornton Creek Basin. The project is designed to improve the water quality of the creek and, based on initial studies and best available science, reduce 6PPD and 6PPD-quinone entering the creek adjacent to the natural drainage systems through infiltration, sorption and filtration within the bioretention cells. The bioretention cells are also designed to treat for total suspended solids, oil (total petroleum hydrocarbons), dissolved copper, dissolved zinc and total phosphorus.

Successful implementation of this project will utilize bioretention cells to treat stormwater and mitigate 6PPD-quinone loadings to streams. The project is also expected to reduce peak flows to Thornton Creek and provide the community with additional benefits such as reduced street flooding, pedestrian safety improvements and healthier creek ecosystems.

Eligibilities:

Per Section 603(c)(5) of the Clean Water Act (CWA), projects that measure to manage, reduce, treat, or recapture stormwater or subsurface drainage are CWSRF eligible projects. The proposed project is to install 43 bioretention cells to potentially retain and treat emerging contaminants from urban runoff, improving Thornton Creek's water quality.

To be eligible for the CWSRF emerging contaminants funds:

1. The presence of an emerging contaminant(s) needs to be confirmed: Previous monitoring has identified 6PPD and 6PPD-quinone in the Thornton Creek basin.
2. A capital project needs to be identified: SPU will construct 43 bioretention cells along roadsides in residential areas within the Thornton Creek basin to treat the identified emerging contaminants.

All of the above make the proposed project eligible for CWSRF emerging contaminants funds.