# Focus on: Monitoring 6PPD-q in the environment

A scientist collects water samples from a salmon-bearing stream to measure levels of 6PPD-quinone. Impervious surfaces can deliver tire contaminants to our waterways.

## 6PPD-quinone in the environment

In 2020, after decades of investigative work by a cross-disciplinary research consortium, scientists from University of Washington Tacoma, Washington State University Puyallup, and their collaborators, identified 6PPD-quinone (also known as 6PPD-q) as the chemical that causes pre-spawn mortality in coho salmon. The chemical comes from 6PPD (6 p-phenylenediamine), found in tires and recycled tire products, when tire dust is exposed to air. When rain falls on tires and roads, it washes tire dust including 6PPD-q into rivers, streams, and estuaries.

To support long-term solutions, researchers are developing assessment studies to help us understand when, where, and how 6PPD-q ends up in the environment. These studies will support toxics-reduction planning and mitigation actions.

## Initial assessment and recommended strategies

In October 2022, we published a legislative report[1] with key findings, research needs, and proposed strategies to reduce 6PPD-q in road runoff.

Important takeaways from the 2022 report to the Legislature:

- The amount and type of stormwater-management strategies to reduce tire contaminant exposure to vulnerable species varies from one watershed to another.
- We need consistent funding to support regional contaminant research to fill the many data gaps and for our partners to continue characterizing the chemicals and impacts associated with tires.
- At this early stage, we recommend using adaptive management strategies.
- Innovative sampling technologies and GIS mapping are decisive tools to measure and assess 6PPD-q.

[1] https://apps.ecology.wa.gov/publications/SummaryPages/2203020.html

## Current and future 6PPD-q monitoring and testing

We are expanding our field monitoring and laboratory capacity to identify areas where the most vulnerable habitats are exposed to road runoff and 6PPD-q. For example:

- We have developed a laboratory method for measuring 6PPD-q in water. This will help us to quantify how much 6PPD-q is in aquatic environments and to evaluate stormwater-management actions.
- We are developing analytical methods for measuring 6PPD-q in stream sediments and fish tissue collected from aquatic environments.
- We are designing field studies to determine the most effective methods for evaluating the scope and scale of 6PPD-q pollution in rivers, streams, and estuaries.
- Mapping tools help us determine how traffic contributes to coho salmon and rainbow trout mortality, including pre-spawn adults and juveniles.
- We are coordinating with local stormwater and salmon monitoring leads to identify areas where tire pollution is most likely to impact aquatic life.

A chemist at Manchester Environmental Lab explains the process for testing 6PPD-q in water samples to Washington's Governor Jay Inslee.

## Collaborating with partners

We continue to work closely with our partners on research and monitoring projects to reduce aquatic life exposure to 6PPD-q. Our partners include the Washington State departments of Transportation, Health, and Fish and Wildlife; University of Washington Tacoma's Center for Urban Waters; Washington Stormwater Center at Washington State University's Puyallup Research and Extension Center; National Estuary Program and Puget Sound Recovery at the U.S. Environmental Protection Agency; Puget Sound Ecosystem Monitoring Program; Northwest Indian Fisheries Commission; and local communities.

## Related Information

- 6PPD in Road Runoff: Assessment and Mitigation Strategies[2]
- Our 6PPD webpage[3]

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[2] https://apps.ecology.wa.gov/publications/SummaryPages/2203020.html
[3] https://ecology.wa.gov/6PPD