

## Method Development for the Extraction of Tire Wear Particles from Roadway Runoff Sediments

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Tire Wear Particles (TWPs) are created from the abrasion between the roadway and the tires. TWPs contain 6PPD, a chemical additive in tires, which can oxidize into 6PPD-quinone when exposed to ozone in air and can be leached from the particles. 6PPD-Q leachate from TWPs has been linked to coho salmon pre-spawn mortality events. TWPs are a source of microplastic (MP) pollution. MP sizes range from 1  $\mu\text{m}$  to 5mm and are highly mobile during rain events where they are washed from roadways into nearby streams, sediments, and catchment basins. This project developed a protocol by reviewing existing literature on MP extraction methods and conducted laboratory trials to improve upon and optimize an existing method for the removal of TWP from roadway runoff sediments. TWP isolation from sediments was conducted by utilizing a density separation technique with a salt solution to isolate TWPs, and then TWPs were identified using visual microscopy. Seven roadway sediment samples were collected at various locations throughout the Puget Sound Region from King to Pierce Counties in Washington State. Recovery of TWP was 0.0001 - 0.0506 g TWP per 50 g solid stormwater sediment with an average of 0.0176g TWPs per 50g solid stormwater sediment. These results can be used to establish a baseline concentration of TWPs to determine a change over time for the regulation of this pollutant. The density separation method was successful in extracting TWPs, however optimization of the procedure is needed to reduce labor needed to complete this work and future method development.