Update about Mercury Sampling by National Pollution Discharge Elimination System Dischargers

In August 2006, the Department of Ecology requested that all National Pollution Discharge Elimination System (NPDES) permitted dischargers in the state analyze mercury levels in their wastewater discharges using the newer, more sensitive method—Environmental Protection Agency (EPA) method 1631E.

Ecology asked the dischargers to report their sampling protocols and any measurements of 0.2 nannograms/liter (ng/L), or 0.2 parts per trillion, or greater. Ecology also requested flow data for the sample dates and the annual average flow. Ecology requested sampling once during wet weather and once during dry weather.

Ecology requested the mercury sampling:

1. To obtain baseline data on mercury loading for Ecology's Mercury Chemical Action Plan.
2. To assess which discharges pose a threat to human health or the environment.

Ecology is tracking mercury reductions as part of its Mercury Chemical Action Plan and under the state Mercury Education and Reduction Act (MERA) passed in 2003. Washington has successfully prevented 12,000 pounds of mercury from entering the environment in Washington over the past five years.

The Water Quality Standards (WAC 173-201A) list five water quality criteria for mercury. The table below provides these criteria in ng/L. Measurements greater than these numbers violate Washington's water quality standards for mercury.

Freshwater acute	Freshwater chronic	Marine acute	Marine chronic	Human health freshwater	Human health marine
2,100	12	1,800	25	140	150

Some permittees have existing requirements to sample for mercury. Ecology requested that only those permittees conduct the additional sampling.

WHY IT MATTERS

When mercury gets into the environment it does not break down and gets into the food chain. It comes from a variety of sources, including products that are thrown in the trash, historic mining practices, and wastewater discharges.

Mercury can evaporate into the air where it can then be deposited into water and soil.

Fish accumulate mercury in their bodies. This in turn can be a source of mercury exposure to people who eat the fish.

Children and fetuses are the most vulnerable to the effects of mercury. Exposure can affect learning and behavior later in life.

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Special accommodations:

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This group included:

- Municipal dischargers with a design flow of one million gallons per day or greater.
- Municipal dischargers with delegated pretreatment authority.
- Industrial dischargers with an application requirement to submit a priority pollutant analysis.
- Any permittees with limits or monitoring requirements for mercury in their permit.

Results

Ecology set a concentration of concern (COC) at 25 ng/L, which is approximately two times the criteria and four times the mean of all reporting cities. We set the COC at this level to prioritize which discharges Ecology should target for source control follow-up.

Municipal and industrial

Ecology received mercury data from 51 municipal permittees—21 of the 43 major facilities and 30 minor facilities. The mean concentration for all cities was 6.4 ng/L and ranged from 0.15 to 50.9 ng/L. For the reporting cities, 44 reported average results below the 12.0 ng/L criteria. Ecology believes the measured concentrations provide good news for most municipalities whose concentrations were below 25 ng/L. However, monitoring results at or above the COC triggers source control actions. Ecology will work with the two reporting cities that exceeded the COC.

Ecology received mercury data from 36 industrial permittees—21 of the 42 major facilities and 15 minor facilities. Some of the facilities provided findings from multiple outfalls. The mean concentration of all industry data submitted was 53.8 ng/L. Mercury concentrations in industrial effluent varied widely and ranged from 0.39 to 254 ng/L. Because some permittees with high effluent concentrations gave Ecology extensive data, Ecology was able to derive a more representative evaluation of the data by calculating the mean of the average of each facility's results. This value (the mean of facilities' means) was 24.5 ng/L. Twelve of the reporting facilities exceeded the 12 ng/L criteria and 10 of these exceeded the 25 ng/L concentration of concern. As with the municipalities, Ecology is requiring source control evaluations for these 12 facilities.

Loading

Not enough of the large industrial facilities (highest volume dischargers) conducted the sampling for Ecology to accurately evaluate the actual loading across the state or into individual water bodies. However, because the variation was lower among the municipal wastewater treatment plants, Ecology was able to estimate a statewide mercury loading from these facilities. Ecology will use this data in future studies calculating loading of toxics to Puget Sound.

Ecology follow-up actions

Based on the analyses, Ecology will now require permittees to use the more sensitive method for future mercury sampling. Ecology will evaluate the facilities with concentrations of concern—levels exceeding 25 ng/L. If there is uncertainty regarding the data, Ecology will require facilities to resample. If sufficient data exist to show an exceedance, Ecology will request the facility to identify and control the sources of mercury in the effluent. As permittees apply to renew their permits, Ecology will evaluate the need for mercury sampling prior to permit re-issuance.