oregon association of CLEAN WATER agencies

Working with community wastewater treatment and stormwater management agencies across the state to protect Oregon's water

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Paula Calvert, Willamette Basin Mercury TMDL Project Manager
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Oregon Department of Environmental Quality
700 NE Multnomah Street, Suite 600
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Sent via email

Subject: Comments and questions regarding the Willamette River Mercury Total Maximum Daily Load (TMDL) Development

Dear Paula:

The Association of Clean Water Agencies (ACWA) is submitting this letter to convey our comments and questions related to documents under review by the Willamette River TMDL Advisory Committee (Advisory Committee). ACWA is a private, not-for-profit professional organization of Oregon's wastewater treatment and stormwater management agencies and associated professional consulting firms. Our members are dedicated to protecting and enhancing Oregon's water quality. Our 125+ statewide members provide sewer and stormwater management services to 2.5 million Oregonians, serving 65 percent of Oregon's homes and businesses.

At the end of the September 19, 2018, meeting, DEQ staff informed Advisory Committee members that DEQ would be working to further consider and address some of the issues raised at the meeting. This letter outlines some of ACWA's initial comments and questions related to the draft technical documents that DEQ recently provided to the Advisory Committee for review. The documents include the "Mercury TMDL Development for the Willamette River Basin (Oregon) – Technical Support Document (Revised Draft)" and the "Potential Options for Willamette River Basin (Oregon) TMDL (Draft)." Both documents are dated August 31, 2018. Our questions and comments based on our initial review are provided below. (Some of these were provided verbally at the September 19, 2018, Advisory Committee meeting). We appreciate DEQ's willingness to consider our concerns and we look forward to continued productive dialogue.

If possible, we would like an opportunity for a conference call session with TetraTech to ask additional questions regarding details of the modeling process and methods. Some of the feedback and comments that we have below could potentially be easily clarified through a better understanding of the background details regarding modeling methods.

Stephanie Eisner, Chair Amy Pepper, Vice Chair Corissa Holmes, Secretary/Treasurer

Comments/Questions Regarding the Technical Support Document

Target Fish Species

Table 4-4 of the Technical Support Document (page 50) presents the species-specific surface water levels of total mercury required to meet the target fish tissue concentration of 0.04 mg/kg of methyl mercury. The discussion states that the most restrictive target is for the northern pikeminnow, and that this species was used in the evaluation consistent with the 2006 TMDL. When the 2006 TMDL was developed, the water quality criteria for human health were based on a fish consumption rate of 17.5 g/day. In 2011, DEQ adopted water quality criteria for human health parameters based on a fish consumption rate of 175 g/day. This represents a significant change in policy that warrants a reconsideration of the approach used in 2006.

As written, the Technical Support Document and Potential Options for Willamette River Basin TMDL do not provide information that would be helpful to understand the potential risk associated with consuming fish from the Willamette. The current presentation of information may easily be misinterpreted regarding the relative risk of fish consumption. The Technical Support Document should identify the information available on the consumption rates of fish and present information on the relative risk by fish species. This information would be valuable in discussing both the technical and policy questions related to methyl mercury levels currently achievable on a basin scale. This information could then be used to define the target mercury concentration.

It is inappropriate to base a TMDL and allocation strategy on the northern pikeminnow, a fish that is only occasionally caught and consumed. The TMDL should be revised to reflect the variety of fish that are consumed in the Willamette River Basin. While the Oregon human health criteria are based on a 175 g/day fish consumption rate, the criterion does not define the type of fish consumed. The TMDL should use an "analog" fish that represents a weighted combination of different types of fish consumed in the Willamette River Basin.

Calibration

On page 18, there is a discussion of model calibration stating that Food Web Model (FWM) parameters were adjusted to minimize the differences between the modeled and observed median CDF values. Could you please include a summary of the specific parameters that were adjusted and the adjustments that were made?

Spatial Considerations (e.g., MeHg to THg ratios):

The Technical Support Document (page 36) notes that the available information is not adequate to develop a methyl mercury (MeHg) to total mercury (THg) ratio on a sub-basin scale. The various data sets used for the TMDL were frequently discontinuous and were collected at different places and at different times. Spatial and temporal variations exist in much of the available data. Because of these limitations, the Technical Support Document uses a single MeHg to THg ratio for the entire Willamette River Basin. However, the Technical Support Document specifies allocations in the form of percent reduction on a sub-basin level, which is inconsistent with using a single basin-wide MeHg to THg ratio.

Since the sub-basin allocations are not supported by data and create a false impression of precision that may create additional work with no environmental benefit, a basin-scale allocation strategy should be used.

Total Mercury Source Loads

Many of the pie charts confuse mercury sources and conveyance pathways. For example, in the figure below, atmospheric deposition/runoff is a primary source of mercury; in the urbanized areas, the municipal storm sewer system (MS4) conveys air deposition to the surface water network. So, in the pie

chart, it would be more accurate to note that 38 percent of the mercury load is from atmospheric deposition of which 4 percent is conveyed to the surface water network through the MS4. It would also be helpful to show how the remaining portion of atmospheric deposition is conveyed to the surface water network (i.e., via the Designated Management Agencies).

In addition, the pie chart should clearly differentiate between local and global sources of atmospheric deposition, as defined by Hope and DEQ in the 2006 Willamette Mercury TMDL. Because pollution control is most effective at the source, DEQ should enunciate in the TMDL document the actions that will be taken to control the localized mercury sources contributing to air deposition of mercury. This information would be useful in defining controllable and uncontrollable sources of mercury.

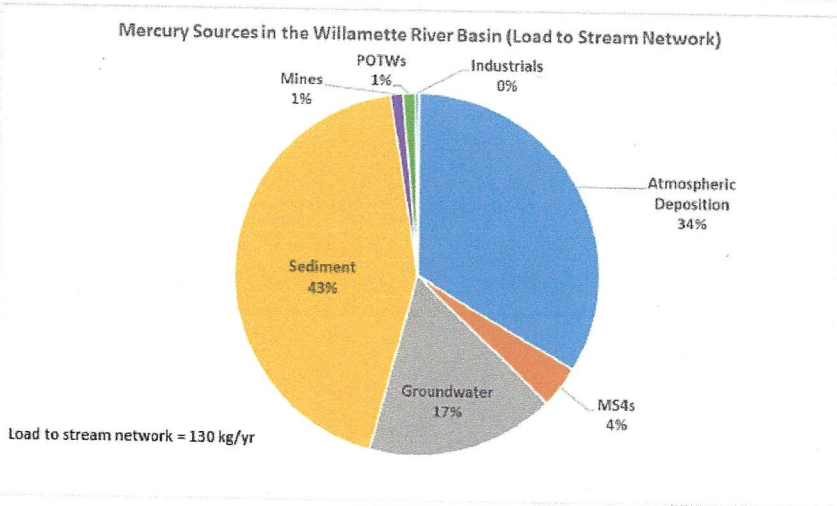

Figure 5-16. Distribution of THg Source Loads to the Stream Network

Domestic Point Source Discharges

Table 5-7 of the Technical Support Document (page 80) lists the major municipal facilities in the watershed. The table includes the City of Gresham's wastewater treatment plant (WWTP), which discharges to the Columbia River not the Willamette River. The facility should be removed from Table 5-7.

Our review of the monitoring data for the facilities suggests that much of the mercury data is not representative of municipal wastewater treatment facilities. Recently, DEQ provided a template for submitting data that more accurately characterizes the flows and mercury concentrations from municipal WWTPs. The Technical Support Document needs to be updated to reflect the updated municipal WWTP data.

Additionally, there are a number of smaller municipal WWTPs in the Willamette River Basin. These include Harrisburg, Junction City, Monmouth, Independence, Brooks, Dundee, etc. The Technical Support Document does not mention these facilities and does not include an allocation strategy for smaller municipal facilities. Similarly, there are other NPDES permittees, including general permit holders that may discharge mercury. The TMDL should establish explicit allocations or clearly define an expectation for developing and implementing mercury minimization plans for these facilities as well.

Stormwater Modeling

We are requesting additional information to help us better understand the approaches and data that were used for the stormwater modeling.

This document states that the National Land Cover Database (NLCD) was used to equate impervious surfaces to effective impervious area. The rationale provided was that the NLCD is known to underestimate impervious area. Was any analysis done to justify that this underestimation is equivalent to typical Effective Impervious Areas (EIAs)? It appears to be an arbitrary analytical decision due to a lack of information on EIA.

We would like to understand the MS4 areas that were used in the model. It would be helpful to have a table to show the MS4 jurisdictions included in the model and the impervious area and the estimated effective impervious area estimations used for each jurisdiction. This information would be helpful in ensuring that areas such as those draining to UICs are not included. We would also like to see these MS4 jurisdictions separated according to whether they are permitted or non-permitted.

The Technical Support document (page 90) describes the methods used to calibrate the stormwater model so that the results would match with the concentrations observed in the collected stormwater data. The calibration required a 55 percent reduction in atmospheric deposition and a change in the design storm causing washoff of 90 percent of the THg from 0.5 inch/hour to 0.08 inch/hour. These calibration adjustments are significant and appear to be arbitrary and unrealistic. On page 62, it is stated that the estimate of atmospheric deposition rates came from a 2016 Western North America Mercury Synthesis project. If the estimated rates are changed significantly for stormwater modeling, then that would indicate the deposition rates should be altered for other components of the mass balance modeling as well. It would be inconsistent to use different estimates for atmospheric deposition for the different modeling components. Could you provide a reference that shows 90 percent of washoff occurring with a 0.08 inch/hour rainfall intensity? Our sense in working with local rainfall and runoff data over many years is that it would take a higher intensity rainfall to wash off 90 percent of the load. The model calibration adjustments do not seem realistic for the stormwater modeling that was conducted.

Given that the stormwater model includes impervious areas with no accounting for the best management practices (BMPs) being implemented throughout the cities, this model fails to consider the sediment transport reduction work that is already being accomplished. In our Phase I NPDES MS4 permit renewal submittals, we provided documentation of our loadings models that includes these BMPs and the area of coverage of the BMPs that could be used in the TMDL modeling work.

The Technical Support document states that combined sewer overflow (CSO) areas were not removed from the stormwater model, and overflow loads were assumed to be equivalent to stormwater runoff loads. This is an arbitrary assumption that is not supported with any analysis. The City of Portland provided a summary of their CSO area and this area should be removed from the model. CSOs are covered under the City's CBWTP permit, not the MS4 NPDES permit.

On pages 62 through 64, there is a summary of total annual loads and text to describe how total loads were developed from the assumed wet and dry deposition rates. An accounting of these values and the rationale how they were developed should be documented and provided in a table. For example, to get a load of 4.7 kg-THg/yr. of wet deposition load to impervious surfaces in MS4 regulated areas, as provided in this document, what land area and what precipitation value were used? We may be mis-interpreting the text, but it currently seems that the numbers are not adding up when trying to match all the deposition rates and associated loads.

The Phase I NPDES MS4 jurisdictions sent DEQ a comprehensive set of mercury data that have been collected. This included data collected both with and without ultra-clean sampling techniques. We

would like to clarify that only the data collected using ultra-clean sampling techniques will be used for TMDL modeling and development purposes.

Potential Options for Willamette Basin TMDL Document

Margin of Safety

The margin of safety (MOS) discussion in the Potential Options document notes that conservative assumptions have been built into the analysis and "provide a significant implicit MOS." The Potential Options Document states that the conservative assumptions used in the TMDL analysis include the use of the northern pikeminnow, use of median target levels rather than an average target level, and use of a fish tissue target based on total mercury whereas the criterion is based on methyl mercury. As noted earlier, it is inappropriate to base a TMDL and allocation strategy on the northern pikeminnow, which is not a target fish and that "may be caught and consumed on an occasional basis." The difference in the in-stream target mercury concentration for the northern pikeminnow and the rainbow trout is significant (0.14 ng/L for northern pikeminnow vs. 0.62 ng/L for rainbow trout). Additionally, use of the median target concentration rather than the average target concentration as the measure of central tendency represents a significant safety factor (0.14 ng/L vs. 0.28 ng/L for the northern pikeminnow). The Potential Options document notes that the use of total mercury instead of methyl mercury also provides an additional implicit MOS in the evaluation. These assumptions have a compounding effect and result in a MOS that is overly conservative and unreasonable. The TMDL should use an explicit margin of safety (e.g. 10%) and make reasonable assumptions in the modeling approach and allocation strategy.

Use of Total Mercury as a surrogate

Several studies, which have included information from the Willamette River Basin, have noted that the amount of methylmercury is more closely related to the amount of wetlands present and that total mercury may not be a good surrogate. (Eagles-Smith et al in *Mercury in western North America: A synthesis of environmental contamination, fluxed, bioaccumulation and risk to fish and wildlife*, Science of the total environment (2006), Chasar et al in *Mercury Cycling in Stream Ecosystems 3., Trophic Dynamics and Methylmercury Bioaccumulation*, the USGS Science Investigations Report 2009-5109, *Mercury in Fish, Bed Sediment, and Water from Stream Across the United States, 1998-2005*). Further reduction from the relatively small contribution from municipal wastewater treatment facilities may not have demonstrable influence on the presence and bioaccumulation of mercury in the Willamette River Basin.

Implementation Strategy for WWTP Point Sources

The Wasteload Allocation (WLA) discussion in the Potential Options document notes that EPA guidance specifies provisions, "*where point sources are contributing a very small amount of the total mercury load, WLAs have been implemented as either criteria-end-of-pipe or as waste minimization plans with follow-up monitoring; most mercury TMDLs have identified the latter as the approach for implementing the WLAs.*" The Potential Options document presents examples of EPA-approved mercury TMDLs in North Carolina, Florida, Minnesota and New England. In these TMDLs, the primary source of mercury was defined to be atmospheric deposition and point source contributions were a very small percentage of the overall mercury load. The permitting approach for point sources was based on implementing mercury minimization plans in accordance with EPA guidance.

For example, the mercury TMDL in North Carolina concluded that:
Due to the low percentage contribution from point source dischargers, the WLA is statewide and is not specified to individual sources, thereby providing a cap for the state. Instead of allocating the WLA among sources with individual limits, mercury reduction will be accomplished through mercury

minimization plans (MMPs) as needed and ancillary efforts that reduce point source particulate loading (e.g., phosphorus controls, biochemical oxygen demands (BOD) / total suspended solids (TSS) reductions, etc). Mercury minimization plans help ensure that discharges have no reasonable potential to cause or contribute to an exceedance of water quality standards.

The mercury TMDL in Florida noted that 0.5 percent of the total mercury load is from point sources and that implementation of mercury minimization plans is the expected strategy for major facilities.

In the Willamette River Basin, the updated modeling estimates that municipal WWTPs and industrial point sources contribute about 1 percent of the overall mercury load. To date, DEQ has not discussed the TMDL approach specified in the EPA guidance and used by the states noted above as a potential pathway. Instead, DEQ has primarily focused on individual or a multi-discharge variance as a permitting pathway for point source discharges.

The variance strategy is a cumbersome, expensive, and time-consuming regulatory process with significant hurdles for DEQ and the permit holders. The TMDL approach used in the states noted above would provide a permitting pathway for WWTP and industrial point source discharges without having to go through the cumbersome variance route. Ultimately, either the more expedient approach used in the states noted above or the variance pathway yield the same result – implementation of a mercury minimization plan and additional monitoring. DEQ should utilize the approach used in the states noted above in the Willamette River Basin Mercury TMDL.

Variances

As noted above, DEQ has discussed a variance as the appropriate permitting pathway for point source discharges. If DEQ is not successful in adopting the strategic approach used in other states and pursues a variance strategy, the TMDL modeling report and allocation strategy document should lay the groundwork for implementing this strategy. The TMDL documents should provide the background information that can subsequently be used in a variance. We suggest reviewing the findings that need to be made for a variance and to the extent feasible, address them in the TMDL documents. This information can then be built upon in the individual or multi-discharge variance applications.

This document should identify controllable and uncontrollable loads; this information can be used to define achievable targets in the basin. Controllable loads should be defined as sources that can be dealt with through the TMDL (e.g. point source discharges, and non-point sources that can be managed through the implementation of agricultural water quality management plans and Forest Practices Act). Uncontrollable sources should be defined as sources that are not going to be changed as a result of the TMDL (e.g. atmospheric deposition, ground water inflow).

Allocations for Stormwater

With respect to TMDL implementation, it is important that permitted jurisdictions are addressed through waste load allocations and non-permitted jurisdictions are addressed through load allocations. As proposed, MS4s and non-point sources are referenced with the same allocations. A table should be provided in the document to show which jurisdiction's stormwater discharges are being addressed under either the point or nonpoint source allocations.

With respect to implementation, if MS4 NPDES permittees continue to be required to develop pollutant load reduction benchmarks, it will be important for the TMDL to either specify a load to reduce, or a

percent reduction. If the TMDL is expressed as a percent reduction, this will need to be paired with a baseline expressed as a point in time to account for beneficial actions already taken.

DEQ should also consider the approach taken in North Carolina, Florida and other states where the states concluded that the primary source of mercury in stormwater runoff is from atmospheric deposition and that the management practices being implemented will reduce mercury loading. For example, the mercury TMDL in North Carolina states the following:

The WLA includes the contributions from regulated stormwater sources. Mercury loading in stormwater primarily comes from atmospheric sources, but also includes small contributions from local sources within the watershed and natural sources. The vast majority of mercury in stormwater originates from air sources and will be controlled accordingly. Although regulated stormwater is considered to be part of the WLA, actual reductions in mercury loading in stormwater will have to be addressed through controls on atmospheric deposition sources that are necessary to meet the load allocation. These controls would be established through appropriate state or federal air laws and regulations. The state anticipates that once atmospheric deposition reductions are met, the only remaining regulated stormwater contributions would be solely attributed to natural sources and run-off from localized non-atmospheric sources. This residual stormwater contribution is considered to be an insignificant part of the WLA.

North Carolina is already engaged in controlling stormwater pollution using best management practices (BMPs) in accordance with Clean Water Act §402(p) and 40 CFR Part 122.44(k), and any residual mercury in stormwater that originates from non-atmospheric sources can be addressed by these programs. The six minimum control measures associated with permits for municipal separate storm sewer systems (MS4s) (http://cfpub.epa.gov/npdes/stormwater/munic.cfm) will contribute toward reducing mercury loading by reducing stormwater volume and sediment loading.

In Oregon, similar to North Carolina, atmospheric deposition is the primary source of mercury in stormwater runoff, and the MS4 NPDES permitted jurisdictions are already engaged in controlling stormwater pollution using BMPs to reduce the discharge of pollutants to the maximum extent practicable. The TMDL approach used in the states noted above would provide a feasible compliance pathway for permitted municipal stormwater discharges that would reduce the administrative burden of implementing TMDL requirements.

General Comments

As a general comment, moving into development of the Water Quality Management Plan, solutions should be optimized for improving overall watershed health. The Technical Support Document states that complex transformation of total mercury to methyl mercury is not simulated but notes that methylation rates are higher in back channels, wetlands, and other quiescent areas in the watershed. Ecosystem assessments of the Willamette Basin show that adding complexity to the stream network by restoring wetlands, providing off channel habitat, restoring riparian vegetation, re-meandering streams, adding woody material, etc. will improve watershed health. The takeaway message from this exercise should not be that these activities will result in higher methylation rates because, as DEQ staff observed during the advisory committee, we really do not have a quantitative understanding of methylation processes in the Willamette Basin.

We need to make sure that we optimize conditions to improve overall watershed health; implementing narrow, parameter-specific solutions does not result in optimized solutions. In evaluating water quality

and defining appropriate controls and strategies, we need to look at water quantity and quality issues in the Willamette River Basin through a lens of overall ecological health rather than a single parameter. This is particularly true when a focus on a single parameter, such as mercury, may lead to irrational requirements, such as expensive, ineffective controls. DEQ should include a discussion in the TMDL documents that identifies the various water quality and ecological issues in the Willamette River Basin and identifies strategies that optimize solutions to improve the overall ecological health of the watershed.

We wanted to provide our initial comments as soon as possible to give DEQ time to consider and address the comments prior to the public comment period. Please let us know if you have any questions regarding these issues. We look forward to seeing the draft Water Quality Implementation Plan and moving forward in the process to develop a TMDL that will be feasible and effective in reducing mercury.

We appreciate the efforts of DEQ to involve ACWA and local government representatives in the update of the mercury TMDL. We also appreciate your recent efforts to work with EPA to seek an extension of the schedule to allow for additional time for consideration, and potential incorporation of stakeholder feedback.

Sincerely,

Susan L. Smith
Executive Director

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