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Subj: Comments on Ecology’s second draft re Performance-based Approach for Developing Site-Specific Natural Conditions Criteria for Aquatic Life in Washington.

Thank you for the opportunity to review and comment on this Performance-based Approach (PBA) guidance. I noted earlier on the first draft that the procedure seems to be very complicated and I questioned whether the procedure ensures predictable and repeatable outcomes. How does Ecology know it does? A test of two different groups to run the process for an area to see if they got the same results would be useful.

I note that the state’s existing numeric marine DO criteria lack any identifiable scientific basis that was presented and defended at any time in the 58 years since the criteria were adopted. Ecology did prepare a marine DO paper in May of 2018 and presented it to the Nutrient Forum on May 30, 2018. That paper had asserted a false basis for the numeric values and was subsequently revised in August of 2018. The revision was called an update, and made no mention of what it was correcting. It was never presented to the Nutrient Forum or through any rulemaking process and it has several other highly misleading and/or false statements.

There might not be a need for natural condition criteria if we had criteria similar to the criteria for Chesapeake Bay.

On Page 16 of the PBA draft it says that the model must have sufficient resolution to….Capture the impacts to all designated uses, including the most sensitive designated use… I am concerned that the Salish Sea model is a primary productivity only model, so it is incapable of evaluating food web impacts. I reject the notion that any nutrients added by humans must only be detrimental to the biota because of effects on DO. Some added nutrients must have beneficial effects up the food chain that will be more significant than harmful effects on DO. The quest for reducing primary productivity may have a net impact on the biota overall that may be greater than the benefit from DO changes.

I understand that the existing Salish Sea Model does not work for shallow areas and numeric criteria. I suggest that such areas would naturally be subject to large swings in DO within a 24-hour period and that the biota there are adapted to such swings. I think there should be no criteria for such areas, and the state’s numeric criteria should not be applied there. I recognize that would probably require a rulemaking.

In Step 8 on page 18 the required elements that must be accounted for and removed when estimating natural conditions include submerged aquatic vegetation and invasive species. It should also include the food web components including zooplankton, forage fish, larger fish, marine birds, marine mammals and benthic organisms.

In Step 8 on page 19, the model outputs of a site must protect designated and existing aquatic life uses by removing all human-caused impacts and pollution to the water of interest. The designated uses in our standards include a range of aquatic species well beyond the phytoplankton (and actually do not include phytoplankton). In order to protect designated uses, the model needs to address key elements of the food chain. The output could well show food chain benefits that would be lost by removing all human nutrient sources. Perhaps it would also show an optimal range of nutrient loading.

Step 9, determining natural condition values. This identifies how in each assessment unit, there would be ten separate natural condition criteria values for each day. This is mind-boggling. I think the model has been working with three different years, none of which are the current year. Natural processes such as river flows, climate, and coastal upwelling vary, and would result in different natural condition criteria for each of the years the model has run. It seems like to evaluate compliance in current years with the criteria it would be necessary to be running the model for the current year(s), which just doesn’t seem practical.

I propose a way to implement the natural condition based criteria in a way that may simplify evaluation and implementation. For each assessment unit, take the lowest 5th percentile DO natural condition value and use that as your natural condition criteria. Values above that would meet the criteria. Then, on an annual basis, the DO values should not be less than the criteria more than 5% of the time. It could also incorporate in the human caused allowance (0.2 mg/L) to the 5th percentile value and that would be a level that the DO should not be lower than more than 5% of the time. If you use the 10th percentile value, then that works too, with DO values not to be lower more than 10% of the time. The idea is to implement the criteria in a manner comparable to the derivation of the criteria.

For Step 9, page 20, in the short paragraph on Criteria frequency it refers to the frequency from WAC 173-201A-210(1)(d), which in turn says that values lower than the criteria should not occur more than once in ten years. There is no biological basis for that number. The history is that in 2003 Ecology submitted to EPA for approval revisions to the water quality standards focused on changing from a class based system to a use-based system, and also focused on temperature requirements in freshwater for salmonids. As those salmonid uses were identified, the existing freshwater dissolved oxygen criteria were just applied to the salmonid uses. EPA came back and said you need to have a frequency component to the criteria, and Ecology went with once every ten years because that was similar to how they used 7Q10 river flows in NPDES permitting to determine conservative mixing zone benefits. 7Q10 stands for seven-day low flow occurring once in ten years. In that rulemaking, there was never an opportunity to comment on the once in 10 years frequency. This frequency could be dropped if the implementation method described in my previous paragraph is implemented, since it has frequency considerations built into it.