Deschutes TMDLs Responses to Comments

Prepared by: USEPA Region 10

8/6/21

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Introduction

This Response to Comments document addresses comments received during the August 7, 2020 through October 7, 2020 public comment period on the Total Maximum Daily Loads (TMDLs) for the Deschutes River and its Tributaries established the U.S. Environmental Protection Agency on July 31, 2020 (EPA's 2020 TMDLs). EPA's 2020 TMDLs were established following EPA's partial disapproval of the Deschutes River, Percival Creek, and Budd Inlet Tributaries TMDLs submitted by the Washington Department of Ecology (Ecology) on December 17, 2015 (Ecology's 2015 TMDLs). EPA's action on Ecology's 2015 TMDLs is discussed in Section 1.2 of EPA's 2020 TMDLs, and the parameters and water bodies addressed by EPA's TMDLs are specified in Table 1 of that document. EPA received eight comment letters submitted by different individuals and organizations during the public comment period. Table 1 presents the list of individuals and organizations who provided comment letters, along with the shorthand identification used for each commenter. The eight comment letters include a total of 140 comments. Each of these comments has been assigned an identification code for reference in this document, and the text of these comments is included below. EPA's response to each of these comments is provided following the comment text.

Table 1. Comment Letters Received

Author Name	Organization	Commenter ID
Mark Toy	Washington State Department of Health	WDOH
Nina Bell	Northwest Environmental Advocates	NWEA
David Kangiser	City of Tumwater	Tumwater
Sue Patnude and Dave Peeler	The Deschutes Estuary Restoration Team	DERT
Andrew Kolosseus	Washington Department of Ecology	Ecology
Lisa Dennis-Perez	LOTT Clean Water Alliance	LOTT
Erica Marbet	Squaxin Island Tribe	SIT
Eric Christensen	City of Olympia	Olympia

Commenter Mark Toy, Washington State Department of Health

Comment ID WDOH 1

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

I wish to clarify your designation of 'Budd Inlet/South Puget Sound' (the area north of Priest Point Park) for Marine Shellfish Harvesting in Table 2 of the Deschutes River TMDL document. Only the very northern part of this area is approved for Marine Shellfish Harvesting, as noted in the attached sanitary survey report for Budd Inlet. I have also attached the most recent annual report for Budd Inlet for your information.

Please note there are two additional wastewater outfalls north of Priest Point Park discharging to Budd Inlet – the Seashore Villa (NPDES #WA0037) and Tamoshan (NPDES #WA0037290) wastewater plants, which would prohibit any shellfish harvest in a good portion of this area.

Response Text

The Washington Department of Health (WDOH) manages recreational and commercial shellfish harvesting and establishes shellfish harvesting closures. However, the designated uses and applicable water quality criteria for marine waters are established by the Washington Department of Ecology and are applied in the Deschutes TMDLs. Designated uses specify the goals and expectations for how a waterbody is used but are not necessarily existing uses. Although Washington's designated shellfish harvest use for marine water quality standards is different from the shellfish harvesting status issued by the WDOH, EPA does not want to cause confusion about the status of shellfish harvesting in Budd Inlet and has added clarification to the Designated Use discussion in Section 3.1 and a footnote to Table 2.

Comment ID WDOH 2

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

There is also a potential for the LOTT wastewater facility (in Inner Budd Inlet) under certain conditions to impact this area as well. More information on these facilities can be found on the Washington Department of Ecology website (https://apps.ecology.wa.gov/paris/PermitLookup.aspx). More information about the Department of Health's Shelllfish program can be found here: https://www.doh.wa.gov/CommunityandEnvironment/Shellfish. Please feel free to contact me if you have any questions concerning the above.

Response Text

The bacteria TMDLs are for creeks that discharge to Budd Inlet, not for Inner Budd Inlet itself. The LOTT wastewater facility discharges to Inner Budd Inlet and is, thus, not applicable to the development of these bacteria TMDLs. As discussed in the responses to related comments (e.g.,

Comment 9 from David Kangiser, City of Tumwater), shellfish harvesting is a designated use north of Priest Point Park based on Washington Department of Ecology's water quality standards. This is a designated use to be protected in the bacteria TMDLs.

Commenter Nina Bell, Northwest Environmental Advocates

Comment ID NWEA 1

Comment Category *Existing temperature TMDLs*

Comment Text

As a general matter, we find that EPA's proposed TMDLs are flawed because they rely on the Washington Department of Ecology's flawed 2015 Deschutes River temperature TMDLs. NWEA has challenged these TMDLs in federal court, see NWEA v. EPA, Case No. 2:19-cv-02079 (W.D. Wash. Dec. 23, 2019). The First Amended Complaint in that case sets forth NWEA's allegations regarding why the temperature TMDLs approved by EPA are flawed.

Response Text

EPA recognizes that NWEA has challenged its approval of 26 temperature TMDLs in Ecology's 2015 TMDL submission. However, EPA approved these TMDLs based on its conclusion that they met the necessary statutory and regulatory requirements in section 303(d) of the Clean Water Act and EPA's implementing regulations at 40 C.F.R. Part 130, and were established at levels that will attain applicable water quality standards when fully implemented. Therefore, EPA determined they are appropriate to serve as the basis for the development of TMDLs addressing DO impairment in the Deschutes River.

Comment ID NWEA 2

Comment Category *Reasonable assurance*

Comment Text

EPA fails to cite the definition of a TMDL that includes the tradeoff between point and nonpoint sources at 40 C.F.R. § 130.2(i). TMDLs at 1.1. This is important because it relates to whether EPA can find reasonable assurance that nonpoint source controls will be implemented such that point sources regulated under NPDES permits can be given greater wasteload allocations.

Response Text

Section 1.1 of EPA's 2020 TMDLs, cited in this comment, is the introduction and contains a general description of the TMDL process. The referenced regulatory provision, 40 CFR 130.2(i), is cited in the first paragraph of Section 8 of EPA's 2020 TMDLs, which discusses reasonable assurances.

Comment ID NWEA 3

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

In the description of the scope of TMDLs addressed by EPA, the agency fails to recognize its failure to have acted on the Ecology temperature TMDLs for such waterbodies as Mitchell Creek. TMDLs at 1.2.

Response Text

Under the Clean Water Act, if EPA disapproves a state developed TMDL, EPA must develop a replacement TMDL. The waterbody and pollutant pairs addressed by Ecology are shown in Table 1 and Table 2 of Ecology's 2015 TMDLs. The Washington Department of Ecology did not submit a temperature TMDL for Mitchell Creek in Ecology's 2015 Deschutes TMDLs. EPA's 2020 TMDLs address those that were disapproved as specified in "Re: Final EPA Action on the *Deschutes River, Percival Creek, and Budd Inlet Tributaries Multi-parameter Total Maximum Daily Load"*. TMDLs that were disapproved and reissued by EPA are listed in Table 1 of EPA's 2020 TMDLs.

Comment ID NWEA 4

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

EPA cites WAC 173-201A-260(b), "When a water body does not meet its assigned criteria due to human structural changes that cannot be effectively remedied (as determined consistent with the federal regulations at 40 C.F.R. 131.10), then alternative estimates of the attainable water quality conditions, plus any further allowances for human effects specified in this chapter for when natural conditions exceed the criteria, may be used to establish an alternative criteria for the water body (see WAC 173-201A-430 and 173-201A-440)." TMDLs at 3.2.2. As the internal citations demonstrate, use of this narrative criterion requires formal adoption and approval from EPA before a site-specific criterion is applicable. It is unclear why EPA cites this provision if it is not using it; it is unclear if EPA is using it without going through a site-specific criterion adoption.

Response Text

The referenced provision, WAC 173-201A-260(1)(b), is quoted within the summary of Washington's narrative criteria, but it was not applied for any of EPA's 2020 TMDLs. Some of EPA's 2020 TMDLs are based on natural conditions criteria which recognize that natural conditions, rather than human structural changes, may prevent attainment of assigned criteria at times in portions of water bodies. EPA has not established site-specific criteria pursuant to the referenced provision relating to human structural changes.

Comment ID NWEA 5

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

Likewise, EPA's use of a predicted natural condition for temperature and dissolved oxygen violates section 303(c) of the Clean Water Act. See e.g., TMDLs at 3.2.6 (EPA applied the natural conditions provision for the Deschutes River upstream of Offutt Lake). In EPA's adoption of the natural conditions value as the applicable water quality criterion, it fails to evaluate whether this purportedly natural condition is protective of the designated and existing uses, which are also water quality standards the TMDL must meet. See e.g., Dale McCullough et al., EPA Issue Paper 5, Summary of Technical Literature Examining the Physiological Effect of Temperature on Salmonids (May 2001).

Response Text

EPA appropriately applied Washington's natural conditions criteria in the circumstances where such criteria are the applicable, EPA-approved water quality standards. Where natural conditions criteria are applied, allowable impacts to all uses are limited to a level that has been determined to be de minimis.

Comment ID NWEA 6

Comment Category *Natural conditions*

Comment Text

EPA's reliance on its approval of Ecology's 2015 Deschutes TMDLs that likewise rely on the natural conditions criterion renders this TMDL flawed. In neither the EPA nor the Ecology TMDLs do the agencies demonstrate that the predicted temperatures and dissolved oxygen levels are actually natural. One reason for this is the agencies' setting the input from tributaries to the Deschutes River at the applicable numeric criteria without any evidence that temperature or dissolved oxygen levels would not be lower or higher, respectively, of those criteria under natural conditions.

Response Text

Both Ecology's 2015 TMDLs and EPA's 2020 TMDLs use a water quality model to approximate temperatures and dissolved oxygen concentrations expected in the Deschutes River under natural conditions (i.e., "system potential"). Both TMDL documents include the rationale for model inputs and scenarios, and discuss uncertainty associated with the approach. Thus, both TMDL documents contain reasonable approximations of natural conditions for the Deschutes River.

The commenter criticizes EPA for using the natural conditions criteria for the mainstem and for using the numeric criteria for the tributaries as if EPA's assessment of applicable criteria were arbitrary. In fact, Washington's water quality standards at WAC 173-201A-210(1)(d)(i) provide for the use of natural conditions criteria under limited circumstances (natural conditions

precluding attainment of criteria). These circumstances were present in the mainstem. In contrast, tributary inputs were based on numeric criteria, which is appropriate given that EPA does not have any information or basis for using a value other than the numeric criteria for the tributaries.

Comment ID NWEA 7

Comment Category *Seasonal variation and critical conditions*

Comment Text

While loading should be presented as a daily load, failing to consider fine sediment on a seasonal basis does not address the seasonality of how sediment is generated. TMDLs at 4.4.1.

Response Text

As discussed in Section 4.4.1 and Appendix C of EPA's 2020 TMDL, the fine sediment TMDL accounts for seasonality in the source assessment, the targets used to set the loading capacity, and in the expression of the TMDL. For the source assessment, the rainfall-runoff erosivity factor used to quantify upland sediment loading accounts for seasonality by summing rainfall erosivity from individual storms across a year, and the landslide and bank erosion loading estimates incorporate sediment loading over multiple years, which inherently captures seasonal variation. The percent embeddedness target reflects deposition that accumulates over the longer term, whereas the turbidity target is protective of daily and seasonal fluctuations in fine sediment in the water column. The daily expression of the TMDL accounts for increased loading during higher flows, whereas the annual loading capacity accounts for variable loading during different seasons because it cannot be met if the maximum daily load is exceeded more than 5 percent of the time.

Comment ID NWEA 8

Comment Category *Source assessment*

Comment Text

EPA fails to explain, other than to cite Ecology's 2015 TMDLs, why it views all bank erosion and the portion of loading from landslides not caused by the presence of unpaved roads to be "natural." TMDLs at 4.4.5. It is well known that landslides can be caused by other human activities, namely logging in landslide prone areas. Likewise, it is unclear why EPA finds that "all bank erosion" is per se natural.

Response Text

A discussion of natural conditions in regard to the sediment source assessment is provided in Section 3.0 of Appendix C within EPA's 2020 TMDLs. While EPA agrees that all bank erosion is not natural, the Raines study (2007) used for Ecology's 2015 TMDLs and EPA's 2020 TMDLs concluded that all erosion included within the bank erosion inventory was natural. The

text in Appendix C denotes that the bank erosion inventory focused on erosion from hillslopes and glacial terraces, which are also referenced in Ecology's 2015 TMDLs as such, and as high bank erosion. This particular type of bank erosion was determined within the 2007 bank erosion inventory (Raines 2007) to be a source of natural net sediment loading to the Deschutes River.

The following additional details about the assessment of landslides in the Deschutes watershed are contained in Ecology's 2012 technical report (Roberts et al.) and its references. The Weyerhaeuser Company maintains an inventory of landslides in the watershed and sediment contributions associated with landslides between 1966 to 2001 were included in this inventory. Road-associated landslides made up 73 percent of the sediment input associated with landslides, and 79 percent of the landslides occurred in weathered bedrock terrain with deep, fine-textured soils. Those landslides associated with roads are inherently linked to anthropogenic activities and are classified as non-natural for purposes of the sediment TMDL. Following receipt of this comment, EPA further reviewed information in the foundational study for the TMDL by Raines (2007) about non-road associated landslides. In Section 5.1.2 Raines states "Landslide features were inventoried as either associated with roads or not. The majority of non-road associated features can be assumed to be directly or indirectly associated with harvest as most of the area had been harvested during the inventory period and the terrain appears to have a naturally low potential for shallow landsliding." Based on this information, EPA reclassified landslides not associated with roads as anthropogenic, or non-natural, sources of sediment in the watershed for the revised final TMDLs, whereas that type of landslide was previously classified as natural in EPA's 2020 TMDLs. The background turbidity level analysis, sediment TMDL target, and allocations were revised accordingly and these modifications are implemented in the revised final TMDLs.

Comment ID NWEA 9

Comment Category *Existing temperature TMDLs*

Comment Text

EPA claims that in modeling the river upstream of Offutt Lake it "found that the numeric criterion in the portion of the river upstream of Offutt Lake would not be met, even when all input values were set to natural levels." TMDLs at 6.1. It states further that it "uses Ecology's temperature TMDLs and associated riparian shade targets for the Deschutes River (found in EPA-approved 2015 Deschutes TMDLs) as the baseline for these dissolved oxygen ("DO") TMDLs. Improving riparian shade will result in cooler stream temperatures that will directly improve DO levels by allowing the water to hold more oxygen, as well as indirectly improve DO levels by decreasing primary productivity[.]" We agree that improving riparian shade will result in cooler temperatures that will help DO levels. But, as EPA goes on to state, the 2015 Deschutes TMDLs for temperature developed by Ecology and approved by EPA only "identify shade targets and establish the thermal heat loads for the mainstem of the Deschutes River." Id. (emphasis added.) Determining the natural temperature of the Deschutes River is not a process that can be accomplished by addressing the shade cast on the Deschutes River alone, ignoring its tributaries and the vast stream network that flows into those tributaries. Without evaluating that

network—typically at least 70 percent of stream miles are above salmonid habitat—EPA cannot rely on a finding that Ecology has determined the natural temperature of the Deschutes River.

Response Text

While EPA disapproved most of the tributary temperature TMDLs in Ecology's 2015 TMDLs for not identifying numeric shade targets and thermal heat loads, Ecology did not ignore the tributaries in its 2015 temperature TMDLs for the Deschutes River. The QUAL2Kw model used in the 2015 and 2020 TMDLs includes thermal inputs from tributaries (including those identified as impaired for water temperature and those not identified as impaired for water temperature because all of the tributaries influence conditions in the mainstem).

Table 21 within Appendix E of EPA's 2020 TMDLs specifies the tributary inputs for the natural condition simulation within the QUAL2Kw model and cites the 2012 Technical Report (Roberts et al.) for Ecology's 2015 TMDLs for the temperature inputs. Further, EPA's 2020 TMDLs contain TMDLs for the following tributaries to the Deschutes River impaired for water temperature: Huckleberry Creek, Reichel Creek, Tempo Lake Outlet, Unnamed Spring to Deschutes River, and Ayer Creek (see Table 1 in EPA's 2020 TMDLs). Section 5 in Appendix E of EPA's 2020 TMDLs states, "EPA is developing TMDLs for tributaries impaired for low levels of DO, temperature, and/or pH. The shade and nutrient targets assigned in those TMDLs were incorporated as inputs to the model." This served as the basis for determining the loading capacity and needed improvements for the mainstem TMDLs addressing DO impairment.

Comment ID NWEA 10

Comment Category *Existing temperature TMDLs*

Comment Text

EPA cites four criteria that were built in to Ecology's "natural conditions temperature scenario" in which Ecology simulated "full, dense, old-growth forest" along "the riparian corridor," and the associated lower temperatures and decrease in sedimentation that would be associated with that forested riparian corridor. TMDLs at 6.2. In addition, EPA states that Ecology "assumed that water temperature standards will be met (or better) with the restoration of shade along the tributary corridors and headwaters" allowing for the use in the model of water temperatures set at the numeric criteria as the inputs for river headwaters and all tributaries. This, of course, is a false assumption.

1) First, the 75-foot and Forest Practice Act riparian buffers called for in the 2015 Deschutes TMDL are not the equivalent of "full, dense, old-growth" forest.
2) Second, the TMDL cannot simultaneously claim credit for calculating a natural condition temperature and dissolved oxygen level and then undercut that natural condition by calling for nonpoint source controls that would not produce those natural conditions.
3) Third, Ecology did not simulate full, dense, old-growth forest.
4) Last, Ecology did not analyze the entire watershed that drains to the Deschutes River.

Response Text

1) The Implementation Plan within Ecology's 2015 TMDL document states that forested stream-side vegetation corridors are needed to make significant progress on the problems related to temperature, but EPA disagrees that this is stating the Forest Practice Act riparian buffers are equivalent to "full, dense, old-growth forest." While the Implementation Plan specifies best management practices that it considers to be in compliance with water quality standards and states that forest practices regulations will be relied on to meet the TMDL load allocations (because these regulations were developed to meet water quality standards), the document also recognizes the uncertainty in how the system will respond to implementation actions. Ecology's 2015 TMDL document states "If landowners or users are applying all specified BMPs to reduce or eliminate their land use activity's impact on water quality, and violations of water quality criteria remain, it may be necessary for landowners and users to modify existing practices or apply additional water pollution control measures to achieve compliance with water quality standards." Nonetheless EPA agrees that the terminology of "full, dense, old-growth forest" used in Section 6.2 of EPA's 2020 TMDLs should be altered to align with Ecology's description for the riparian shading target, which is "mature riparian ecosystem growth." EPA has made this edit in the revised final TMDL.

2) It is unclear which nonpoint source controls this comment is referencing, but as stated above, the implementation measures outlined in the Implementation Plan within Ecology's 2015 TMDL document are intended to meet the TMDLs. However, the Implementation Plan also recognizes the importance of the adaptive management process during the implementation of TMDLs. EPA finds this to be a reasonable approach that does not undercut the TMDLs.

3) As described above, the single reference in Section 6.2 of EPA's 2020 TMDL document to system potential being "full, dense, old-growth" has been revised to reflect mature riparian ecosystem growth, but the section does correctly denote that EPA applied the same system potential vegetation criteria used by Ecology for the 2015 temperature TMDL. That TMDL included simulation of "mature system potential vegetation," with a maximum height of 50 meters, a density of 95 percent, and an overhang of 4.5 meters. Simulation of system potential vegetation along tributaries Black Lake Ditch and Percival Creek were assumed to be at a height of 40 meters, a density of 90 percent, and a 4-meter overhang for non-wetland soil types. For wetland soil types, system potential vegetation was characterized as having a height of 10 meters, a density of 75 percent, and a 1-meter overhang. The system potential vegetation inputs associated with Black Lake Ditch and Percival Creek were used in the tributary shade modeling as part of EPA's TMDLs, as described in Appendix F, Section 2.2.3.

4) See response to NWEA's Comment 9.

Comment ID NWEA 11

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

Spawning is a designated use that must be protected throughout the Deschutes River basin. See e.g., 2015 Deschutes TMDLs at 5. EPA's TMDLs fail to demonstrate that the intragravel dissolved oxygen levels sufficient to protect the beneficial uses will be met by either Washington's dissolved oxygen numeric criteria or by any superseding natural conditions criteria established in the TMDL. The National Marine Fisheries Service ("NMFS") has raised this concern and it has not yet been addressed:

Under section 7(a)(1) of the Endangered Species Act, Federal agencies shall utilize their authorities in furtherance of the purposes of the Endangered Species Act, including the conservation of endangered and threatened species. The EPA has determined that the conservation measures described below are in furtherance of the goal of conserving endangered and threatened species and are part of EPA's action analyzed in this opinion.

1. Dissolved Oxygen Criteria - Ecology has committed to review their DO criteria and initiate rulemaking to revise the standards to 11 mg/L by July 2008, unless they can demonstrate that the current 9.5 mg/L criteria will not lead to adverse effects to incubating salmonid eggs.

NMFS, Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the Washington State Water Quality Standards – Environmental Protection Agency's Proposed Approval of Revised Washington Water Quality Standards for Temperature, Intergravel Dissolved Oxygen, and Antidegradation Statewide consultation (Feb. 5, 2008) (hereinafter "NMFS 2008 BiOp") at 15: see also id. At 13 (referring to the dissolved oxygen numeric criteria as "interim"), 110 – 111 (EPA's approval of the interim dissolved oxygen standard is not expected to cause a measurable decline in salmonid populations because it has a "limited scope and duration of the action (2007 to 2009)").

Response Text

EPA agrees that spawning is a designated use that must be protected. Refer to Table 2, which identifies the waterbody segments to which the "salmonid spawning, rearing, and migration" is applicable. The State of Washington has established dissolved oxygen numeric criteria that apply to the spawning use. EPA recognizes there are ongoing discussions regarding potential revisions to dissolved oxygen numeric criteria to protect incubating salmonid eggs; however, these have not yet resulted in Washington's submittal of revised or new water quality standards. The TMDLs are required to support designated uses and achieve the water quality standards currently in effect for Clean Water Act purposes. Therefore, the TMDLs employ the existing, CWA-applicable, dissolved oxygen criterion for this spawning use of 9.5 mg/L, except where the circumstances are present to use the natural conditions provision of Washington's water quality standards.

Comment ID NWEA 12

Comment Category *TMDL Miscellaneous*

Comment Text

There are numerous instances when the readability and usability of the TMDLs would be enhanced by including the addition of percentage reductions that are needed. For example, Tables 9 and 27, for example, should show percentage reduction of the targets and the existing loads.

Response Text

Table 9 contains the annual load allocation for the fine sediment TMDL. Percent reductions can be computed using the existing source loads provided in Appendix C, Table 5. Likewise, percent reductions for Table 27 that lists targets for the mainstem Deschutes River TMDLs can be computed using information in Appendix E, Table 14. EPA's approach to the main document was to try to streamline it for improved readability; EPA has decided not to include additional percent reductions since they are more relevant to implementation and not a required component.

Comment ID NWEA 13

Comment Category *TMDL Miscellaneous*

Comment Text

Similarly, it is ironic that the very last two pages of Appendix E include Figures 26 and 27 that demonstrate TN and TP reductions upstream of Offutt Lake for three sites require 77 to 92 percent and 60 to 92 percent, respectively, but this information does not appear to appear in the main TMDL document.

Response Text

See response to NWEA Comment 12.

Comment ID NWEA 14

Comment Category *Load allocations*

Comment Text

Table 37 would be more useful if it included a column on the difference between the existing and future effective shade.

Response Text

The difference between existing and target future effective shade can be computed by subtracting the former from the latter. For example, the difference in effective shade for Huckleberry Creek is 97 percent (effective shade target) minus 96 percent (existing effective shade) equal to 1 percent. For additional information see the response to NWEA's comment 12.

Comment ID NWEA 15

Comment Category *TMDL Miscellaneous*

Comment Text

Table 41 presents the effective shade target but it does not present the existing shade information and the percentage difference, both of which could be helpful indications of how much change is needed in the so-called practical measure.

Response Text

Table 41 includes the existing daily heat load and target daily heat load expressed in terms of kWh/day; the difference between the values provides information about the change needed to meet the temperature TMDLs for these waterbodies.

Comment ID NWEA 16

Comment Category *Data for TMDL development*

Comment Text

Use of data that date to 2003 and 2004—over 15 years ago—demonstrates the TMDL is of questionable value and EPA does not even say whether it thinks these data are still valid. TMDLs at 6.3.1.

Response Text

EPA agrees that more recent data would be desirable, and we did include more recent data from Ecology and local municipalities that were available for development of EPA's 2020 TMDLs. EPA evaluated the representativeness of the data relative to current conditions by analyzing population and land use changes and determined the data from 2003 and 2004 used to calibrate and validate the model are still a reasonable dataset and the best available representation of conditions at the watershed scale.

Comment ID NWEA 17

Comment Category *TMDL Miscellaneous*

Comment Text

EPA states that "many [hatchery] facilities" use settling basins. It fails to point out that many do not and in many cases, settling basins have fallen apart and cannot be used. TMDLs at 6.3.2. If EPA does not know whether these hatcheries have and use settling basins, it should not speculate.

Response Text

The statement that many hatcheries use settling basins was a general statement related to possible treatment of hatchery effluent. It was not intended to imply that the hatcheries in these TMDLs do or do not have settling basins.

Comment ID NWEA 18

Comment Category *Seasonal variation and critical conditions*

Comment Text

We agree that "effects of excess nutrient loading may occur during multiple times of the year" because sediment and plant matter release nutrients. TMDLs at 6.4.1. It does not follow, however, that this seasonal variation can be addressed, as EPA proposes, through "flow-variable nutrient TMDLs." Id. That analysis merely states that the lower the flow, the lower the loading allowed, meaning that it is aiming for the same concentration. See e.g. TMDLs at 6.4.2; see also id. At 7.4.5.2 (EPA states that for each nutrient TMDL for named tributaries, a single load allocation ("LA") is established for all nonpoint sources, including natural background, and concludes that allocations "scale like the TMDLs shown in Figure 9 and increase during periods of greater streamflow/stormwater runoff."). Aiming for the same concentration does not have the effect of aiming for ensuring that nutrient loading does not build up in sediments and plant matter that subsequently release those loads in times and places unrelated to the flows and with an adverse impact. The response of algae and plants to nutrient additions typically is non-linear because somewhere between approximately 10 and 60 percent of total nitrogen ("TN") and total phosphorus ("TP") are adsorbed to particulates or taken up by biota. While DO critical conditions are during warmest periods, nutrient critical conditions when N and P are released are not necessarily during these same periods. All that Table 31 and Figure 5 demonstrate is that concentration is the result of water volume and pollutant load, which is essentially the same as having the TMDL establish criteria for TP and TN, which are concentrations, not loads.

Response Text

The TMDLs established to address DO impairments do not establish water quality criteria for total nitrogen (TN) and total phosphorus (TP). Rather, the TMDLs establish the nutrient loads required to meet the applicable DO water quality standards. The loading capacities are presented in Table 31 for the Deschutes River upstream of Offutt Lake and downstream of Offutt Lake for the 5^{th}, 10^{th}, 50^{th}, 90^{th}, and 95^{th} flow exceedance frequencies (percent of time flow is equaled or exceeded). When the flow of the Deschutes River near Rainer (USGS 12079000) is at 129 cubic feet per second (cfs), which is the 50^{th} percentile, the TN and TP targets downstream of Offutt Lake are 467 and 12 kg/day, respectively, for example. These loading capacities were derived from the instream nutrient concentrations shown to be protective of DO criteria under critical conditions (7Q10 flow and 90^{th} percentile air temperature), based on QUAL2Kw modeling described in Appendix E. TN and TP TMDLs were computed using the equations presented in Section 6.4.2, which apply nutrient concentrations from QUAL2Kw modeling, however, result in target loads.

The flow-variable approach specifies allowable loads across the spectrum of flows observed across seasons and not solely during the warmest periods as suggested in NWEA's comment. The flow-variable targets address the maximum daily load that is protective under alternative flow conditions to prevent long-term accumulation of nutrients in sediment, biota, and the water column. This is consistent with EPA guidance in the memorandum titled, *Establishing TMDL "Daily" Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in* Friends of the Earth, Inc. v. EPA, et al., *No.05-5015, (April 25, 2006) and Implications for NPDES Permits*. The memorandum states "If technically appropriate and consistent with the applicable water quality standard, it may also be appropriate for the TMDL and associated load allocations and wasteload allocations to be expressed in terms of differing maximum daily values depending on the season of the year, stream flow (e.g., wet v. dry weather conditions) or other factors." Further discussion of the flow-variable approach to address seasonality can be found in Section 6.4.1.

Comment ID NWEA 19

Comment Category *Margin of safety*

Comment Text

For margins of safety ("MOS") and load allocations, EPA discusses the conservative assumptions built into the model for shade and heat loads but at no point does it discuss the role of TN and TP in combining with warm stream temperatures to produce lowered DO levels. TMDLs at 6.4.4 & 6.4.5. The lack of explanation of the MOS for nutrient loading also undercuts the allocations because "[s]ince the MOS is implicit, the LAs are equivalent to the TMDLs for TN and TP." TMDLs at 6.4.5. The same comments apply to the TMDLs for tributaries. TMDLs at 7.4.1, 7.4.2.

Response Text

Nutrients are not discussed within the MOS for the TMDLs addressing DO impairment in the Deschutes River because EPA determined that the conservative assumptions denoted in Section 6.4.4 regarding shade and heat, as well as those incorporated into the modeling analyses such as the application of critical flow and air temperatures, adequately address uncertainty in the TMDL process without the need for conservative assumptions about nutrients. As discussed within the MOS, conservatism was also incorporated into the wasteload allocations. Sections 6.1 and 6.2, as well as Appendix E, describe the relationship between nutrients and temperature in affecting DO levels, and that an approximation of natural temperatures were applied within the QUAL2Kw model as the baseline in determining nutrient levels that will achieve DO concentrations that meet water quality standards.

The relationship between water temperature, nutrients, and DO levels is also discussed within Section 7.1 and 7.2. For the tributary TMDLs, however, no water quality model was used, so conservativism was incorporated into the reference-based values selected as nutrient targets as part of the implicit MOS, as described in Section 7.4.2.

Comment ID NWEA 20

Comment Category *Surrogate measures*

Comment Text

That "shade as a surrogate [for temperature] is a commonly-used approach" is not a rationale for using it here without providing further information that would make the surrogates completely usable. TMDL at 7.1.1. The principle of surrogate measures, as set out by the federal advisory committee to EPA in 1998 was that "TMDLs with surrogate measures should guide actions (regulatory and/or voluntary) necessary to achieve water quality standards" and that where they are used, "a higher degree of implementation specificity and stronger procedures for follow-up monitoring and evaluation may be required." EPA, Report of the Federal Advisory Committee on the Total Maximum Daily Load (TMDL) Program (July 198) at 34. What would improve these TMDLs immeasurably is if EPA used the model to determine what riparian buffers would accomplish the task of meeting the TMDLs load allocations. Instead, the TMDL drifts off like a "whistling Pete" firework, starting with a bang and ending with a whimper.

Response Text

The statement that shade is often used as a surrogate approach is not intended to be a rationale for using surrogate measures in the tributary temperature TMDLs. The temperature TMDLs express heat loads intended to meet applicable temperature WQS in kWh/day. Effective shade levels are also given for the reason cited by the federal advisory committee referenced by the comment: An effective shade target is provided as a surrogate measure along with each temperature TMDL because it can more clearly guide actions and implementation measures to restore vegetation in the riparian corridor that is needed to achieve the temperature water quality standards. As also described in Section 7.1.1., shade is used because riparian shade loss is the primary cause of temperature impairment and restoring riparian shade is necessary to meet the temperature TMDLs. Furthermore, as described in Appendix F Section 2.0, EPA did model site-specific riparian buffers along tributary riparian corridors using the Shade model. Specifications applied in the Shade models, such as vegetation height, density, and overhang as well as attributes of the tributary streams, are described in Section 2.2 of Appendix F.

Comment ID NWEA 21

Comment Category *TMDL Miscellaneous*

Comment Text

The dissolved oxygen and pH analysis for the named tributaries covered in the TMDLs suffer from the same faulty analysis as that for the Deschutes River. TMDLs at 7.1.2.

Response Text

This comment refers to issues raised in other comments provided by NWEA. The comment does not clearly specify the aspects of the analyses that are referred to; however, it references Section 7.1.2 of EPA's 2020 TMDLs. This section describes the benefits of improving riparian shade in the context of improving DO levels. NWEA's intent with this comment is unclear.

Comment ID NWEA 22

Comment Category *Loading capacity*

Comment Text

Oddly, EPA states that for the tributaries it used "ecoregionally derived targets for TN and TP for all tributary waterbodies impaired for DO and pH," but in discussing the TN and TP targets for the Deschutes River, it did not explain the derivation of the concentration "targets." TMDLs at 7.1.2.

Response Text

The nutrient targets for TN and TP TMDLs established to attain the water quality standards for DO applicable to the Deschutes River are based on the analyses conducted and documented in Appendix E. The concentration targets upstream and downstream of Offutt Lake are presented in Section 6.0. As discussed in Section 5.0 of Appendix E, the TN and TP loading capacities for the mainstem are based on QUAL2Kw modeling under critical conditions. The Level III ecoregion (Cascades and Puget Lowlands) nutrient concentration targets were applied for the tributaries in the QUAL2Kw natural conditions scenario (see Table 19 in Appendix E and the associated discussion).

Comment ID NWEA 23

Comment Category *Existing temperature TMDLs*

Comment Text

EPA identifies the "targets" for each tributary as a surrogate measure based on effective shade "because it is the primary factor influencing stream temperature in the tributaries." TMDLs at 7.2. EPA ignores that the 2015 Deschutes TMDL itself found in addition to shade's primary role (4.5°C), river temperatures were significantly affected by a combination of microclimate (0.7°C), channel width (1.3°C), headwater and tributary temperatures (0.4°C), and baseflow (0.3°C), for a total of 2.7°C. See 2015 Deschutes TMDL at 40.

Response Text

EPA acknowledges that Ecology's 2015 TMDLs described the impacts of microclimate, channel width, and headwater and tributary temperatures on mainstem water temperatures. These factors, however, are fully attributed to (i.e., caused by) restoration of vegetation and shade in the riparian corridor. For example, on page 129 of Ecology's TMDL Technical Report (2012), it

states: “Microclimate improvements. Increases in vegetation height, density, and riparian zone width are expected to result in localized decreases in air temperature.” Furthermore, it states: “Reduced channel width. Channel banks are expected to stabilize and become more resistant to erosion as the riparian vegetation along the stream matures.” Therefore, while shade is the primary factor influencing tributary temperatures, EPA considered the other factors mentioned above because secondary benefits are inherent with the restoration of riparian shade to system potential levels, which is required for the tributary temperature TMDLs as described in Section 7.2 of EPA’s 2020 TMDL document. The improved tributary temperatures (to at or below water quality standards) will be achieved when those TMDLs are implemented.

Comment ID NWEA 24

Comment Category *Surrogate measures*

Comment Text

Moreover, the phrase “system potential riparian vegetation,” a “species generally expected to be Douglas Fir,” does not meet the definition of a surrogate measure because it is not readily translated into the field, where riparian buffers are measured as heights, widths, and densities. Without translating the so-called loads of shade into real world surrogate measures that can be used in the field, EPA has fallen well short of the purpose of a TMDL.

Response Text

EPA has established temperature loading capacity and allocations in terms of kWh/day as well as effective shade. Percent shade is expressed along with thermal heat loading to the stream because it is relatively easy to measure in the field for implementation purposes. The system potential vegetation associated with the percent shade is defined in Ecology’s 2015 TMDLs as 50-meter height, 95 percent density, and 100 meters on either side of the near-stream disturbance zone along the Deschutes River (see pages 39-40 and Table 23 in Ecology’s 2012 TMDL Technical Report (Roberts et al.). System potential vegetation is defined along tributaries as 40-meter height, 90 percent density, 4-meter overhang, and for wetland areas, 10-meter height, 75 percent density, and 1-meter overhang (Section 2.2.3 in Appendix F of EPA’s 2020 TMDLs). These measures can be applied in the field. Additionally, shade can be measured in the field using a solar pathfinder and/or hemispherical photography.

Comment ID NWEA 25

Comment Category *Loading capacity*

Comment Text

In Table 35, EPA refers to “water quality targets,” a phrase not defined in the TMDL regulations, including concentrations of TN and TP that “correspond to EPA recommendations for the Puget Lowlands Level III ecoregion based on reference conditions.” We agree with the use of the ecoregion values. Concentrations, however, are not loads so EPA’s mixing of effective shade

percentages as surrogates for temperature loading and concentrations of nutrients all in one category of "targets" is mixing a numeric equivalent of a water quality standard with a TMDL. That the underlying criteria violated here are for DO and pH is irrelevant; a concentration is still not a load.

Response Text

EPA disagrees that a water quality target is the same as a TMDL and must be a load. The term "water quality target" is described in EPA's Guidelines for Reviewing TMDLs Based on Existing Regulations issued in 1992 (2002) as:

> "a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical (e.g., chromium) contained in the water quality standard. The TMDL expresses the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorus and the numeric water quality target is expressed as Dissolved Oxygen (DO) criteria)."

Additionally, although the temperature TMDLs are expressed using effective shade, both temperature and nutrient TMDLs are expressed as daily loads. See also the response to NWEA 18.

Comment ID NWEA 26

Comment Category *Existing temperature TMDLs*

Comment Text

EPA cites the 2015 Deschutes TMDLs for the proposition that "lack of riparian vegetation is the primary source of elevated water temperatures in the Deschutes watershed," but ironically does not point out that those TMDLs do not address the "watershed" but, rather, merely the Deschutes River. TMDLs at 7.3.2.1.

Response Text

Section 7.3.2.1 of EPA's 2020 TMDLs summarizes findings from Ecology's temperature TMDLs for the Deschutes River that identify lack of riparian vegetation as a primary source of elevated water temperatures in the mainstem. This comment states that Ecology's temperature TMDLs do not address the watershed, however, that is not accurate. Page 61 of Ecology's TMDLs specifies allocations for the river and watershed as follows; "The LA for the Deschutes River and all tributaries is the shade that would result from full mature riparian vegetation, microclimate, channel improvements, and decreased headwater and tributary temperatures." The allocations for the headwaters and tributaries address the Deschutes River and the watershed. See the response to NWEA's comment 9 for additional information.

Comment ID NWEA 27

Comment Category *Existing temperature TMDLs*

Comment Text

EPA further states that Ecology's "model identified channel morphology and microclimate as important secondary factors," in elevating water temperatures, failing to point out that each of those secondary factors along with baseflow, tributaries, and headwaters were individually found to contribute more than the allowable cumulative human contribution of 0.3ºC above the applicable criteria. EPA concludes that "achieving target shade conditions will also improve the secondary factors," because they are "inherently linked to the condition of the riparian vegetation." We agree, there is some inherent linkage. However, EPA is incorrect in concluding that a TMDL "target" based on "system potential shade" is the same as that which is required to remove all human warming caused by the so-called secondary factors. EPA does not evaluate whether either the simulated riparian vegetation in Ecology's model or the riparian vegetation buffers that are deemed adequate to meet the load allocations for temperature in the 2015 Deschutes TMDLs are sufficient to achieve the temperature benefits associated with the so-called secondary influences.

Response Text

As described in the response to NWEA's comment 1, EPA recognizes that NWEA has challenged its approval of state-establishedmainstem temperature TMDLs. Nevertheless, these TMDLs have been approved by EPA, which means that upon review of Ecology's 2015 TMDLs, EPA determined the temperature TMDLs for the Deschutes River were established at levels that will attain Washington's water quality standards when fully implemented.

The quotes in this comment are from Section 7.3.2. of EPA's 2020 TMDLs, which contains the TMDLs to address DO and pH impairments in the tributaries. The statements quoted were used in the context of describing the rationale for EPA's approach to the tributary DO and pH TMDLs, which are not based on Washington's natural conditions provision for temperature, but on meeting the numeric temperature criteria along with nutrient targets. However, the secondary factors that are impacted by riparian vegetation and shading are components of Ecology's 2015 temperature TMDLs for the Deschutes River.

Comment ID NWEA 28

Comment Category *Surrogate measures*

Comment Text

EPA does not identify the width of the riparian buffer it has in mind to cast this system potential shade so it does not compare that expected width of vegetation with the width that is required to not mobilize TN and TP loading from streamsides by "filtering nutrients from overland flow and groundwater." EPA's filtering is just conceptual. But the role of the TMDL is to quantify the conception, which EPA does not even attempt to do. Instead, EPA engages in platitudes: "Many

sources that reduce riparian shade also may contribute excess nutrients to the impaired tributaries." TMDLs at 7.3.2.2.

Response Text

Section 2.2.1 of Appendix F in EPA's 2020 TMDLs discusses the TTools application; the riparian buffer was simulated as nine segments of 4-meters (36 total meters) on both sides of the stream. The statement quoted from EPA's 2020 TMDLs is part of the general discussion of nutrient sources and recognizes the well-documented ability of riparian buffers to filter nutrients. The TMDLs for nutrients specify the total maximum daily load for TN and TP necessary to meet water quality standards, but there is no requirement to specify the buffer width needed to meet those TMDLs. The width needed to meet the nutrient TMDLs will vary along the continuum of each impaired tributary depending on the source of nutrients and the characteristics of the buffer.

Comment ID NWEA 29

Comment Category *TMDL Miscellaneous*

Comment Text

Figures 7 and 8, while helpful, merely compare TN and TP concentrations of water quality samples to the concentration targets from EPA guidance, demonstrating that, as EPA writes, "nonpoint sources contribute excess loads of TN and TP to all tributaries." TMDLs at 7.3.3.2. It then presents the loading of these pollutants from stormwater sources. Since loads, set out in Tables 39 and 41, cannot be readily read against concentrations, the meaning of this is lost.

Response Text

The range of observed TN and TP concentrations and ambient concentrations for reference streams in the Puget Lowlands Ecoregion (Level III) are shown in Figures 7 and 8. Tables 39 and 40 show the existing stormwater TN and TP loads from point sources. Section 4 of Appendix F describes the methodologies for the source assessment. In Section 4.3, the event mean concentrations and runoff volumes that were applied to estimate loads from stormwater sources (in Tables 39 and 40) are described. Thus, the TMDLs provide both concentrations and loads for stormwater sources in the catchments of the waterbodies addressed.

Comment ID NWEA 30

Comment Category *Surrogate measures*

Comment Text

We disagree that "the practical measure for meeting the TMDL is attainment of the percentage of effective shade necessary to meet the heat load." TMDLs at 7.4.4.1. Where impacts on the riparian vegetation involve cutting trees (e.g., logging), EPA does not explain how an effective shade percentage is a "practical measure." After the trees have been cut down, the remaining

shade can be measured to see if it is adequate but it is not a practical measure to protect and restore water quality, which is the purpose of the TMDL.

Response Text

EPA expressed temperature TMDLs as heat loads in terms of kWh/day in Table 41, as well as expressing these loads as effective shade, because shade is a more tangible expression compared to a heat load and will aid in guiding restoration activities. Sections with the highest shade deficits under current conditions can be prioritized during implementation. For example, the shade deficit along Ayer Creek is highest about 160 meters from the headwaters at 78 percent as shown in Table F-1 in Appendix F. As discussed in the response to NWEA's comment 24, specifications for riparian corridor width and vegetation height, density, and overhang serve as concrete measures to facilitate water quality restoration and protection (also see Section 2.2.3 in Appendix F of EPA's 2020 TMDLs). Regarding the tree cutting example in this comment, effective shade targets can also be used proactively to inform timber management and best practices so that harvests are done in a way that does not diminish the existing effective shade.

Comment ID NWEA 31

Comment Category *Surrogate measures*

Comment Text

In addition, while Table 41 shows the existing head load and the TMDL limits, it does not provide the information on the expected temperature of the five waterbodies on the list, despite EPA's having used the TMDL to supersede the numeric criteria using the natural conditions criterion for temperature.

Response Text

EPA applied the numeric water quality standards for temperature for the tributary temperature TMDLs, not the natural conditions water quality criterion as implied in this comment (i.e., for waterbodies listed for temperature in Table 41). Washington's surface water quality standards are designed to protect aquatic life for freshwaters. Numeric temperature criteria are specified in WAC 173-201A-200(1)(c) and are expressed as the highest allowable 7-day average of daily maximum water temperatures (7-DADMax). The TMDL targets do not supersede the numeric criteria. Rather, the allowable heat load and effective shade targets are set to achieve the numeric water temperature standards applicable to these five waterbodies.

Comment ID NWEA 32

Comment Category *TMDL Miscellaneous*

Comment Text

EPA's analysis of dissolved oxygen and pH for the named tributaries suffer from the same problems as its analysis of the Deschutes River. TMDLs at 7.4.4.2, 7.4.5, 7.4.5.1.

Response Text

This comment is almost identical to NWEA comment 21 and the intent is unclear. Refer to EPA's response to NWEA comment 21.

Comment ID NWEA 33

Comment Category *Existing temperature TMDLs*

Comment Text

EPA states that for reasonable assurance it is relying on the implementation plan component of the 2015 Deschutes TMDLs, which it states identifies the conservation of existing riparian buffers and establishment of additional forested buffers as the most critical action needed[.]" TMDLs at 8. For example, in fact, Ecology's plan identified the riparian buffers required by the Forest Practices Act for commercial logging lands, and buffers of 75-feet for perennial waters and 35-feet for constructed ditches, intermittent streams, and ephemeral streams. See 2015 Deschutes TMDLs at 116. These only apply to named rivers and streams. Therefore, when EPA claims that its TMDL and the state's TMDL "rely on riparian vegetation being at its fullest potential," it is mischaracterizing what Ecology established as the goal of the TMDL's implementation, which is not riparian vegetation at its "fullest potential" and not across the watershed. These called-for riparian buffers are Ecology's statement of the equivalent of the phrase "full site potential vegetation" or the effective shade load allocation and/or targets set out in EPA's TMDLs, yet EPA has not demonstrated that they are equivalent. (The 100-foot setback of livestock watering facilities for control of fecal sources is the only other numeric best management practice set out in Ecology's TMDL.)

Response Text

It is suggested in the comment that Ecology's 2015 TMDLs do not call for implementation actions across the entire watershed. The load allocations required are specified on page 61 of Ecology's 2015 TMDLs: "The LA for the Deschutes River and all tributaries is the shade that would result from full mature riparian vegetation, microclimate, channel improvements, and decreased headwater and tributary temperatures." The allocations are therefore applicable along the mainstem, headwaters, and tributaries across the watershed. The watershed-wide actions are also discussed under the Implementation Plan for general land use (Table 23). EPA's 2020 TMDLs also describe commitments from stakeholders to support restoration efforts; examples of projects related to riparian restoration are described in Table 20 in EPA's 2020 TMDLs.

Page 116 of Ecology's 2015 TMDLs states, in reference to the Deschutes River and several tributaries to the Deschutes River, "These areas are subject to the Forest Practice Act rules for riparian buffer widths." Moreover, page 130 of Ecology's TMDLs states, "The state's forest practice regulations will be relied upon to bring waters into compliance with the load allocations established in this TMDL on private and state forest lands." Thus, Ecology's TMDLs acknowledge that implementation of the Forest Practice Act requirements contributes to achieving the targets set forth by the Deschutes River temperature TMDLs. In Ecology's 2015

TMDLs (page 130), Ecology commits to a formal adaptative management program to assess and revise the rules if these do not lead to attainment of water quality standards for temperature. Ecology also established performance measures and targets as well as effectiveness monitoring plans that will be used to redirect adaptive management as needed. For additional information, refer to NWEA's comment 10.

Comment ID NWEA 34

Comment Category *Reasonable assurance*

Comment Text

Vague and unmeasurable statements included in the implementation plan for the TMDL that EPA characterizes as "cultivating cropland so it minimizes soil and nutrient loss," are not the basis for a belief that nonpoint sources will be controlled sufficiently to meet the load allocations of this TMDL.

Response Text

As discussed below in EPA's response to NWEA comment 36, EPA disagrees that the implementation plan must quantify or be prescriptive about BMPs. Various management practices can be used to meet the same goal and the most appropriate BMPs will vary by location. However, the language cited is one example of an action from Table 23 of Ecology's Implementation Plan (referenced by Ecology's 2015 TMDLs), which lists implementation actions by land use category, and the table contains several categories with more specific details regarding soil and nutrient BMPs, as well as identifying priority areas. As stated in Section 8 of EPA's 2020 TMDLs, "EPA concludes there is reasonable assurance that implementation of the LAs and WLAs will occur and water quality standards will be achieved." Additionally, Section 8 of EPA's 2020 TMDLs also notes "Ecology has indicated that their 2015 Implementation Plan will be used as a starting point for implementing the TMDLs established in this document," and EPA anticipates that the Implementation Plan will evolve to provide additional details regarding implementation of the approved Ecology 2015 TMDLs and EPA's 2020 TMDLs as part of the adaptive management process.

Comment ID NWEA 35

Comment Category *Reasonable assurance*

Comment Text

Furthermore, that the long-awaited and much delayed Budd Inlet TMDL is, apparently, once again, "under development," and that Ecology "plans to re-engage the Deschutes stakeholder group" once again is not the basis for a reasonable assurance finding.

Response Text

Ecology is in the process of developing the Budd Inlet TMDL. Additional information can be

found on Ecology's website. Section 8 of EPA's 2020 TMDLs does not claim this as reasonable assurance. Rather it states that Ecology plans to re-engage the Deschutes stakeholder group that assisted with the development of the Implementation Plan for Ecology's 2015 TMDLs in conjunction with the development of the Implementation Plan for the Budd Inlet TMDL.

Comment ID NWEA 36

Comment Category *Reasonable assurance*

Comment Text

EPA's parroting of Ecology's statement in the 2015 Deschutes TMDL that "'Ecology will consider affected stakeholders in compliance if all appropriate BMPs have been implemented and are being operated and maintained correctly by 2030,'" provides no assurances because the only "appropriate BMPs" established beyond the platitudes of the 'do a better job' type are the livestock watering setback and the riparian BMPs discussed above. Since no analysis has been conducted to see if these numeric BMPs are adequate to meet the load allocations, and the remainder are vague hints to do the right thing, this statement wholly undercuts the value of the TMDLs. And without numeric BMPs, there is no way for Ecology to judge whether what is in place in 2030 is adequate to meet the TMDL or not. EPA errs in relying on the 2015 Deschutes TMDLs.

Response Text

The statement about BMPs quoted in this comment is made in general terms because the type of BMP and level of improvement needed varies by source. EPA disagrees that without numeric BMPs, the effectiveness of the BMPs cannot be evaluated. Because the goal of TMDLs is to attain water quality standards, Ecology's Implementation Plan provides for effectiveness monitoring of its surface water to gauge progress towards achievement of the TMDLs and associated water quality standards. EPA finds in Section 8 of EPA's 2020 TMDLs that Ecology's BMPs contain sufficient detail and appropriate flexibility to address the impairments in these TMDLs.

Comment ID NWEA 37

Comment Category *Reasonable Assurance*

Comment Text

EPA cites to an unnamed 2015 document that claims it will "conduct effectiveness monitoring and evaluate progress towards milestones at 5 year intervals, and that adaptive management will be applied to adjust the actions required and try new strategies if necessary" without irony, despite the fact that this year, 2020, is the five-year interval since Ecology completed the Deschutes TMDL and there is no evidence of such a progress evaluation's having been started let alone completed. TMDLs at 8.

Response Text

The "unnamed" 2015 document is the 2015 TMDL Implementation Plan, which is cited within Section 8 of EPA's 2020 TMDLs (Ecology, 2015). Part of adaptive management is basing the timeline for evaluating progress towards TMDL attainment on actions implemented. Some actions in the Implementation Plan have been implemented, such as those referenced in the City of Olympia comments 2 and 5. However, EPA's partial approval of the 2015 TMDLs did not occur until June 2018, and EPA's establishment of replacement TMDLs for those TMDLs it disapproved occurred in July 2020. . Given the timeline of events, EPA believes Ecology is not being inconsistent with the intent of the Implementation Plan to evaluate TMDL progress at regular intervals once the TMDL allocations are established.

Comment ID NWEA 38

Comment Category *Reasonable Assurance/TMDL Implementation*

Comment Text

Then EPA hints that it has something it won't show the public: "Ecology outlined a schedule to evaluate TMDL implementation and has communicated to EPA its commitment to adjusting it as necessary if significant improvement in water quality is not shown." If EPA thinks that this is so essential, why is it not an attachment to the EPA TMDL?

Response Text

The implication that EPA is not disclosing a portion of the Implementation Plan is incorrect. The quoted sentence refers to the schedule discussed within the "Measuring Progress Towards Goals" section of Ecology's 2015 TMDL document (p. 133). Ecology, in discussions with EPA, has verbally communicated a commitment to adjusting the Implementation Plan as needed to ensure progress toward achieving the TMDLs. As is also noted in Section 8 of EPA's 2020 TMDL document, "Ecology has indicated that their 2015 Implementation Plan will be used as a starting point for implementing the TMDLs established in this document."

Comment ID NWEA 39

Comment Category *Existing temperature TMDLs*

Comment Text

Since EPA concludes that "the baseline restored riparian shade and effective heat loads established in the 2015 Deschutes TMDLs will be essential for meeting the DO water quality standards," Section 6.4.2., and those temperature TMDLs do not demonstrate that they will achieve temperature standards, EPA's reliance is faulty.

Response Text

Refer to the response to NWEA's comment 1.

Comment ID NWEA 40

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

In its analysis of Capitol Lake Designated Use Evaluation, EPA erred in not considering the beneficial uses that are protected in Capitol Lake as existing uses. TMDLs at Appendix B. Existing uses are protected under Tier I of the antidegradation policy. WAC 173-201A-310 (Tier 1); WAC 173-201A-020 (definition of Existing uses). In addition, the state determined the designated uses (and applicable criteria for core summer salmonid use) for Capitol Lake. See Ecology, Deschutes River, Capitol Lake, and Budd Inlet Temperature, Fecal Coliform Bacteria, Dissolved Oxygen, pH, and Fine Sediment Total Maximum Daily Load Technical Report Water Quality Study Findings (June 2012) at 20. EPA changed the core summer salmonid use for Capitol Lake (and its tributaries) to the salmonid spawning, rearing, and migration use. EPA cannot unilaterally change that state determination; instead, the state must pursue a Use Attainability Analysis.

Response Text

Freshwater bodies without a specified designated use in Table 602 of WAC 173-201A-602 are to be protective of uses listed in WAC 173-201A-600. Capitol Lake is not in Table 602; per WAC 173-201A-600 (1): "All surface waters of the state not named in Table 602 are to be protected for the designated uses of: Salmonid spawning, rearing, and migration; primary contact recreation; domestic, industrial, and agricultural water supply; stock watering; wildlife habitat; harvesting; commerce and navigation; boating; and aesthetic values." The standards also state that all lakes and feeder streams to lakes (reservoirs with a mean detention time greater than fifteen days are to be treated as a lake for use designation) are to be protected for the designated use of core summer salmonid habitat. As described in Appendix B to EPA's 2020 TMDLs, Capitol Lake's residence time does not qualify it as a lake. Therefore, the salmonid spawning, rearing, and migration use is applicable to Capitol Lake directly and a use attainability analysis is not necessary.

The TMDLs are developed to be protective of designated uses; the comment does not provide specific existing uses that are purportedly not being addressed and therefore EPA lacks the information necessary to evaluate unidentified existing uses described in this comment.

Comment ID NWEA 41

Comment Category *Data for TMDL development*

Comment Text

While Ecology calculated the detention time of Capitol Lake based on data from 1991 to 2001, EPA reached far back in time to include data from 1946. The detention time from 1946 is irrelevant to Capitol Lake because the dam that created the lake was built in 1951. See

Washington State Department of Enterprise Services (DES), Frequently Asked Questions (hereinafter "FAQ") (last accessed Oct. 2, 2020).

Response Text

The only data EPA used in the detention time analysis that dated to 1946 were 30-day-10-year low flows from the USGS gage on the Deschutes River at E Street, which were verified with USGS (pers. comm., 2020) as not being affected by the presence of the lake. Therefore, EPA disagrees that the data are irrelevant to represent long-term low flows into Capitol Lake in calculating detention time. However, to be more consistent with Ecology's approach, EPA revised the detention time analysis as documented in Appendix B using gage data from 2000 – 2019 and updated surface area estimate as discussed in response to NWEA comment 42 and 43.

Comment ID NWEA 42

Comment Category *Data for TMDL development*

Comment Text

In addition, while according to the DES, "[t]oday, the lake is about 21 percent smaller and it holds roughly 60 percent less water than it did in 1951," due to the approximately 35,000 cubic yards of sediment from the Deschutes River that are deposited in the lake annually, EPA failed to take a reasonable step to use updated lake surface area in calculating the detention time in order to attempt to remove Capitol Lake from Ecology's lake criteria for DO while using updated flow data through 2019. Moreover, although EPA is using both data that pre-date the dam and those that reflect a much smaller lake than after it was created (from 2019), it is not developing a TMDL that will be useful into the future when there is a significant likelihood that the DES will employ strategies to "manage sediment accumulation and future deposition," i.e., DEQ will likely dredge the lake in the future, which will reduce the retention time once again. See FAQ.

EPA must release the data it used to make these calculations, explain why its proposed TMDL has any relevance to likely future conditions of Capitol Lake when dredging and measures to prevent future deposition have occurred, and address the future lake volume in the TMDLs' margin of safety.

Response Text

See EPA's response to NWEA comment 41 regarding a revised time period for the flow values used in the detention time calculation in Appendix B to EPA's 2020 TMDLs. EPA contacted DES regarding the statement cited in the comment from its website and was told this statement does not reflect recent calculations by DES (Martin, pers. comm., 2020).

Prior to release of EPA's 2020 TMDLs for public comment, EPA sought a recent surface area estimate for Capitol Lake which could be used to update the lake volume and detention time. However, as described in Appendix B, EPA applied an older volume estimate to calculate the detention time because a recent estimation of the surface area of Capitol Lake was not available at that time. Based on public comments received, EPA conducted further analyses for Capitol

Lake to update its volume. Aerial imagery was used to determine the lake surface area. This was then combined with DES's January 2020 bathymetry survey data to update the lake volume. The revised analysis is described in Appendix B. The bathymetry data points consist of point locations and associated depths. They are in an Excel spreadsheet file and can be provided upon request. They are also in the docket for the TMDL document. All other data used are publicly available and the sources are included in the revised final Appendix B.

TMDLs are established to meet applicable water quality standards, which include designated uses of each impaired waterbody and downstream waterbodies, as is the case for Capitol Lake in EPA's 2020 TMDLs. The factors evaluated to determine the applicable aquatic life designated use for Capitol Lake are explained in Appendix B. EPA believes current conditions for lake volume and detention time are appropriate to apply for the downstream water quality standards analysis and designated use determination, which is based on current downstream water quality criteria. Should future conditions in the lake change in a manner that would affect the detention time, EPA believes it is appropriate for the State to re-evaluate the designated use determination made in these TMDLs as part of its adaptive management process.

Comment ID NWEA 43

Comment Category *Data for TMDL development*

Comment Text

EPA should also collect accurate data on the surface area of Capitol Lake, which it says is missing.

Response Text

See EPA's response to NWEA comment 42.

Comment ID NWEA 44

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

It is an error on EPA's part to develop a TMDL for TP and TN for 2012 Listing ID No. 47756 on the Deschutes River between the Lake Lawrence Tributary and Reichel Creek and omit the waters of Lawrence Lake itself, which is listed as impaired for TP, and Lake Lawrence Creek, which is listed as impaired for DO, both of which obviously are sources to the Deschutes River and that need to be controlled.

Response Text

Under the Clean Water Act, if EPA disapproves a state developed TMDL, EPA must develop a replacement TMDL. This set of TMDLs addresses those that were submitted by Ecology in its 2015 TMDLs but disapproved by EPA, as described in the introduction of EPA's 2020 TMDLs. Lake Lawrence was not included in Ecology's 2015 TMDL submittal. The TMDL to address the

DO impairment for Lake Lawrence Creek (Listing ID 47696) is included in the 2020 TMDL document because EPA disapproved Ecology's 2015 TMDL for Lake Lawrence Creek, as shown in Table 1.

Comment ID NWEA 45

Comment Category *Downstream water quality protection*

Comment Text

EPA errs in developing a TMDL for TP in the Deschutes River that is intended to be protective of Capitol Lake by only analyzing the DO requirements for Capitol Lake and ignoring the fact that Capitol Lake is impaired for TP, see Listing No. 22718.

Response Text

Washington's narrative criteria are applicable for nutrients and no translator has been set to quantify the level of phosphorus that meets water quality standards. However, action values for lakes are specified in Washington's water quality standards at WAC 173-201A-230(1). An action value is the "total phosphorus (TP) value established at the upper limit of the trophic states in each ecoregion" (WAC 173-201A-020). If these values are exceeded, this indicates a nutrient problem may exist and additional study is necessary.

The 303(d) listing for Capitol Lake was based on an exceedance of the action value of 20 ug/L; thus, EPA used this value to determine the TMDL's protectiveness of Capitol Lake. EPA calculated the TP load capacity for the Deschutes River based on a water target of 19 ug/L. This target was selected to address DO impairment in the river and not phosphorus impairment. Because the TP target for the Deschutes River is more stringent than the action value for Capitol Lake, EPA concluded it is protective of downstream water quality.

Comment ID NWEA 46

Comment Category *Downstream water quality protection*

Comment Text

EPA errs in not evaluating the role of Deschutes TP's contribution to Capitol Lake's TP impairment that Ecology has determined is the primary source of impairment to Budd Inlet's DO levels. See Ecology, Butt Inlet TMDL Update [to] Deschutes Advisory Group (May 18, 2017).

Response Text

See EPA's response to NWEA comment 45 regarding EPA's analysis of the protectiveness of the TP TMDLs addressing DO impairment for the Deschutes River relative to the TP impairment in Capitol Lake. Ecology is working on the Budd Inlet DO TMDL, and nutrient contributions from Capitol Lake and the Deschutes River watershed are part of that project. During the process of developing a TMDL for Capitol Lake or Budd Inlet, if Ecology determines that additional nutrient reductions to the Deschutes River are necessary to meet standards in Capitol Lake or

Budd Inlet, it has the option of assigning lower allocations upstream. See EPA's response to DERT comment 2 more for information about downstream TMDLs and potential nutrient reductions.

Comment ID NWEA 47

Comment Category *TMDL implementation*

Comment Text

There is no TMDL when EPA's only analysis is that "[i]mplementation measures to control sediment loads will support the needed reductions in nutrient loads." TMDLs Appendix E at 11.

Response Text

The TMDLs to address DO impairment for the Deschutes River are described in Section 6 of the main report. The associated TMDL targets are specified in Section 6.4.2 and load and wasteload allocations are presented in Section 6.4.5. The claim that there is no TMDL is not accurate. Further, QUAL2Kw modeling analyses served as the basis for the Deschutes River TMDLs. The modeling assessments are described in Appendix E. The statement regarding implementation measures quoted in this comment is intended to describe that practices that control sediment are expected to provide co-benefits and will aid in achieving the nutrient targets set forth by the mainstem TMDLs addressing DO impairment.

Comment ID NWEA 48

Comment Category *Source assessment*

Comment Text

Approximating rates for wetland and barren land uses for TP and TN based on the State of Minnesota is highly questionable. TMDLs Appendix E at 24. At a minimum, EPA does not explain why soils and streams in Minnesota are in any way related to those in Washington. The appendix states that the EPA ecoregion reference levels are: TP for the Cascades and Lower Puget Level II Ecoregions are 0.00906 and 0.0195 mg/L, respectively and TN for the Cascades and Lower Puget Level II Ecoregions are 0.055 and 0.340 mg/L, respectively. TMDLs Appendix E, Tables 4 and 5. While we have not looked at the Minnesota citations, we do know that a similar study included data from the Corn Belt of the Midwest and the 25th percentile of its compilation was up to 3.26 mg/L of TN and up to 0.63 mg/L of TP, which are much higher than the applicable ecoregions here. See Miltner, R.J. (2011) Technical Support Document for Nutrient Water Quality Standards for Ohio Rivers and Streams. Draft (December) Ohio EPA Technical Support Document.

Response Text

As discussed in Appendix E, export coefficients from Herrera (2007) based on land use in King County and Puget Sound Regional Council were applied for developed land, agriculture, and

forest. The report did not include export coefficients for wetland and barren land uses. Thus, the rates specific to those land use categories were applied from Minnesota. While the 25th percentile of instream TN and TP concentrations may be higher in Minnesota compared to Washington, this is largely attributed to the fact that more land is used for crop cultivation in Minnesota compared to Washington; it does not imply that loading rates from wetlands or barren land are equivalently high in Minnesota. Furthermore, as shown in Figure 2 of Appendix E, wetland, barren, and water land uses, when combined, cover less than 5 percent of the catchments of the mainstem segments impaired for DO.

As described in Appendix E, the export coefficients were used to better understand the relative proportions of nonpoint source nutrient loads in the drainage area, however, these do not directly impact the targets and allocations established through the TMDLs addressing DO impairment. Target TN and TP loads protective of in-stream DO were established through QUAL2Kw modeling analyses as described in Appendix E. Comprehensive general load allocations are established upstream and downstream of Offutt Lake for all land uses in Table 32 and Table 33 of the TMDL document.

Comment ID NWEA 49

Comment Category *TMDL implementation*

Comment Text

Moreover, EPA's reliance on White et al. (2015) is substantial but there is no discussion about why EPA relies on it to override what Herrera (2007) said about export coefficients. Even so, the report concludes that: "Forests, the largest land use category, were estimated to contribute 48 – 57 percent of upland TN loading at the river outlet and near Reichel Creek, respectively. Similarly, forests constitute 21 – 53 percent of upland TP loading at the same locations." TMDLs Appendix E at 24. So, while the appendix makes clear that forests are the primary source of both TN and TP, there is no analysis that supports the EPA conclusion that riparian buffers that will provide full potential shade will likewise control nutrient pollution to meet the TMDLs. TMDLs Appendix E at Figures 10 – 13.

Response Text

Refer to the response to NWEA's comment 49 for additional information on the application of the land use export coefficients. White et al. (2015) did not override Herrera (2007) as described in this comment. Export coefficients from Herrera (2007) were applied for land uses included in that study. However, export coefficients for shrub/scrub and grassland were not available. Thus, ratios were derived from White et al. (2015) and applied to the Herrera (2007) yield for forest to approximate export coefficients for these land uses lacking rates in Herrera (2007) – see Section 4.3 in Appendix E.

While forest lands are the largest source of upland TN and TP loads at the Deschutes River outlet (Figure 10 and Figure 11 in Appendix E) this is due to extent; forest is the largest land use category in the watershed (Figure 2). Forest TN and TP yields, or unit area loads, are lower than

developed lands, cultivated cropland, pasture, shrub/scrub, and grassland – see Table 13 in Appendix E. Therefore, conversion from another land cover/use in the riparian zone to forest is anticipated to reduce nutrient loading to streams.

Comment ID NWEA 50

Comment Category *Existing temperature TMDLs*

Comment Text

EPA both failed to evaluate the shade allocations to achieve nutrient reductions and the riparian buffers in Ecology's 2015 Deschutes TMDLs for adequacy to meet temperature standards. See e.g., William Ehinger et al., Type N Hard Rock Study Stream Temperature/Shade [Presentation to TFW Policy Committee] (Oct. 5, 2017); William T. Peterjohn et al., Nutrient Dynamics in an Agricultural Watershed: Observations on the Role of A Riparian Forest, 65 Ecology, 5 at 1466 (Oct. 1984); John Neiber et al., Evaluation of Buffer Width on Hydrologic Function, Water Quality, and Ecological Integrity of Wetlands, Minnesota Department of Transportation Research Services (Feb. 11 2011); Bernard W. Sweeney et al., Riparian deforestation, stream narrowing, and loss of stream ecosystem services, 101 PNAS 39 (Sept. 28, 2004) at 114132; Bernard W. Sweeney et al., Streamside Forest Buffer Width Needed to Protect Stream Water Quality, Habitat, and Organisms: A Literature Review, Journal of the American Water Resources Association (JAWRA) 50(3): 560-584 (June 2014); Paul Adamus, Effects of Forest Roads and Tree Removal In or Near Wetlands of the Pacific Northwest: A Literature Synthesis (Dec. 2014); Bernard W. Sweeney et al., Resurrecting the In-Stream Side of Riparian Forests, 136 Journal of Contemporary Water Research & Education 17-27 (June 2007); Aimee P. McIntyre et al., Effectiveness of Experimental Riparian Buffers on Perennial Non-fish-bearing Streams on Competent Lithologies in Western Washington(Sept. 2018); EPA, Interim Riparian Buffer Recommendations for Streams in Puget Sound Agricultural Landscapes (Originally proposed as federal Option 3 for the Agriculture Fish and Water (AFW) Process, March 2002) Guidance (Oct. 28, 2013 Final); Seth Wenger, A Review of the Scientific Literature on Riparian Buffer Width, Extent and Vegetation (revised edition, March 5, 1999); R. Richard Lowrance et al., Waterborne Nutrient Budgets for the Riparian Zone of an Agricultural Watershed, 10 Agriculture, Ecosystems and Environment 371-384 (1983); R. Richard Lowrance, The potential role of riparian forests as buffer zones (1996); Nick Haycock et al., Buffer zones: their processes and potential in water protection, Harpenden (UK): Quest Environmental, 128-33 (1996); Roxane S. Palone, Chesapeake Bay riparian handbook: a guide for establishing and maintaining riparian forest buffers, US Department of Agriculture, Forest Service, Northeastern Area State and Private Forestry (1998); Calvin D. Perry, et al., Watershed-scale water quality impacts of riparian forest management, Journal of Water Resources Planning and Management, 125(3), 117-125 (1999).

Response Text

Ecology's temperature TMDLs did not require nutrient reductions for the mainstem; however, shade that results from full mature riparian vegetation was required for the mainstem,

headwaters, and tributaries in Ecology's 2015 Deschutes TMDLs. EPA's approval of Ecology's 2015 temperature TMDLs for the Deschutes River included a finding that appropriate methods were used to determine system potential conditions and that the load capacity was adequately identified, which means it is established at a level necessary to meet water quality standards. Refer to responses to the following NWEA comments for additional information – 1, 9, and 33. The shade targets identified in Ecology's mainstem temperature TMDLs were applied in the QUAL2Kw receiving water modeling analyses used to quantify the nutrient targets for the TMDLs addressing DO impairment in the Deschutes River but not to achieve the nutrient targets as suggested in the comment.

Comment ID NWEA 51

Comment Category *Natural conditions*

Comment Text

While EPA does not state what vegetation height Ecology used to calculate natural shade in the Ecology model, Ecology did. See 2015 Deschutes TMDL at 40 ("Height was based on the tallest existing vegetation in the system (50m), excluding some very tall conifer stands (60m)."). That 50 meters, or 164 feet, does not represent the "full, dense, old-growth forest" that EPA claims the TMDL calls for and/or assumes in the model. See e.g., Ecology, South Fork Nooksack Temperature TMDLs (2020) (approved by EPA on May 6, 2020) ("The climax vegetation height of 290 ft (88.4 mm) was chosen to represent not the 100-year site potential value, but rather the estimated natural/ old-growth/climax conditions for a fully forested natural riparian buffer of primarily Douglas fir trees. This climax vegetation height is applied to all riparian vegetation and was chosen based on an analysis of Douglas fir heights from field work across the state of Washington (Grah, 2014)."). Taller trees and an increased buffer than was used in the model were demonstrated to produce greater shade, see id. at 128 (Fig. 65), leading one to the obvious conclusion that the assumptions in the Deschutes TMDL model are not representative of natural conditions as they purport to be and certainly not of the "full, dense, old-growth forest" of EPA's description.

Response Text

EPA's TMDLs addressing DO impairment in the Deschutes River mainstem apply the effective shade targets identified in Ecology's TMDLs. The vegetation height, density, and overhang and riparian buffer width, for which the effective shade targets are based on, are described in Ecology's TMDL document, which EPA references in the context of the its 2020 TMDLs in Section 6.1 and in Appendix E, and EPA has provided in the response to NWEA comment 10.

EPA did not intend to imply that alternative measures were needed with the riparian vegetation description of "full, dense, old-growth forest along the riparian corridor". To clarify this, EPA has revised the statement to align with Ecology's terminology of "full mature riparian vegetation" when describing the riparian conditions incorporated into Ecology's temperature TMDLs. Second, on page 39 of Ecology's TMDL document, it is stated that "The system potential temperature is an estimate of the temperature that would occur under natural conditions.

The system potential temperature is based on the best estimates of the mature riparian vegetation, riparian microclimate, and natural channel characteristics that do not include human influences." Furthermore, system potential mature riparian vegetation is defined in Ecology's TMDL document as "Vegetation which can grow and reproduce on a site, given climate, elevation, soil properties, plant biology, and hydrologic process." These aspects were addressed in the QUAL2Kw simulation of natural water temperatures by Ecology using site-specific information (i.e., may differ from other locations or conditions such as the South Fork Nooksack watershed).

Comment ID NWEA 52

Comment Category *Source assessment*

Comment Text

EPA's report demonstrates that significant sources of nutrients are coming from some tributaries that drain the watershed that are not included in these TMDLs. TMDLs Appendix E, Figures 14, 15, 16.

Response Text

Water quality of the tributaries is represented in the QUAL2Kw model of the Deschutes River used to develop the TMDL targets. As shown in Table 23 of Appendix E, natural nutrient conditions for headwaters, tributaries, springs, and groundwater are required upstream of Offutt Lake for the mainstem Deschutes River TMDLs. EPA also established TMDLs for tributaries impaired for DO, pH, and water temperature that were included in Ecology's 2015 TMDLs and disapproved by EPA.. The highest organic phosphorus and ammonium concentrations in tributaries are near river mile 60 for Ayer Creek, which is assigned nutrient loading capacities in EPA's 2020 TMDLs. Additionally, although the mainstem Deschutes River TMDLs were established based on existing inputs for unimpaired (i.e., non-303(d) listed) tributaries downstream of Offutt Lake, the Implementation Plan does make recommendations for such tributaries. For example, Chambers Creek watershed is identified as a priority area for addressing nutrient loading from onsite-septic systems. Additionally, quantifying nutrient sources to tributaries and evaluating them for future nutrient reduction strategies is identified as an action item for Ecology (Table 38, Ecology's 2015 TMDLs).

Comment ID NWEA 53

Comment Category *Existing temperature TMDLs*

Comment Text

EPA's report purports to identify "natural condition water quality inputs for the headwaters, tributaries, diffuse groundwater inflows, and spring inflows." TMDLs Appendix E at 5.3.2. While EPA likely chose an appropriate means of identifying natural nutrient inputs, they have not identified natural conditions for temperature.

Response Text

See EPA's response to NWEA comment 6 regarding natural temperature condition inputs for the QUAL2Kw model. Additionally, Section 5.3.1 of Appendix E explains EPA's approach for determining natural conditions for temperature. The temperature analyses were completed as part of Ecology's approved temperature TMDLs in its 2015 TMDL document (e.g., see discussion on page 39 of Ecology's TMDL report). Refer to EPA's response to NWEA comment 1 for EPA's rationale on why the 2015 temperature TMDLs are appropriate to serve as the basis for the development of EPA's 2020 TMDLs.

Comment ID NWEA 54

Comment Category *Climate change*

Comment Text

EPA's conclusion that no nutrient reductions are needed downstream of Offutt Lake because reductions in temperature will be sufficient to meet the numeric criterion does not account for climate change impacts to temperature. EPA is well aware that these impacts will be significant. See Ecology, *South Fork Nooksack River Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan (Feb. 2020);* EPA, *EPA Region 10 Climate Change and TMDL Pilot – South Fork Nooksack River, Washington, Final Project Report (Sept. 2017);*EPA, *Qualitative Assessment: Evaluating the Impacts of Climate Change on Endangered Species Act Recovery Actions for the South Fork Nooksack River, WA (Oct. 2016);* EPA, *Quantitative Assessment of Temperature Sensitivity of the South Fork Nooksack River under Future Climates using QUAL2Kw (Oct. 2016);* EPA, *Total Maximum Daily Load (TMDL) for Temperature in the Columbia and Lower Snake Rivers May 18, 2020 TMDL for Public Comment (May 18, 2020).*

Response Text

EPA recognizes the global and regional effects to in-stream temperatures and hydrology resulting from climate change trends. For this TMDL document, the temperature conditions used to inform EPA's determinations regarding temperature and nutrient loading were based on Ecology modeling scenarios simulating natural conditions for temperature reflecting several variables, including air temperature, flow, and shade provided by riparian vegetation. Establishing critical conditions for the TMDLs using 90th percentile air temperatures and low flow conditions provide for the temperature TMDLs (and nutrient TMDLs established to address DO impairments) to be protective of the uses under reasonably foreseeable worst-case situations. This means that the TMDLs incorporate extreme conditions occurring and likely to occur with greater frequency in association with climate change. EPA believes the uncertainty regarding the level of these changes to the Deschutes River at a more regional scale means that these potential impacts are best addressed as part of an adaptive management component of the TMDL implementation plan. Further, the State may revise the TMDLs and/or implementation plan as appropriate to address future changes in conditions.

Comment ID NWEA 55

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

Deciding that the natural conditions override the 9.5 mg/L DO criterion upstream of Offutt Lake, and adding an additional drop in DO of 0.2 mg/L because it is allowed but not required, the report concludes that "the DO water quality criteria upstream of Offutt Lake range from 8.6 – 9.0 mg/L (Table 24)." TMDLs Appendix E at 5.5. This conclusion does not evaluate the impact on designated and existing uses of a new criterion, particularly (1) the combined impact of higher natural condition temperatures along with lower natural condition DO levels on fish metabolism and health; (2) the impact of climate change on both; and (3) the impact of the lowered natural condition criteria on intragravel dissolved oxygen levels, a concern with the numeric criteria. See NMFS 2008 BiOp at 15, 110 – 11 (NMFS expressing serious concerns about whether the interim DO criteria protect levels of IGDO in salmon redds.)

Response Text

EPA's 2020 TMDLs are designed to attain and maintain the current, applicable water quality standards, as required by the CWA and its implementing regulations. WAC 173-201A-200 (d)(i) states, "When a water body's D.O. is lower than the criteria in Table 200 (1)(d) (or within 0.2 mg/L of the criteria) and that condition is due to natural conditions, then human actions considered cumulatively may not cause the D.O. of that water body to decrease more than 0.2 mg/L." This standard is applicable for CWA purposes and the circumstances are present for its use in the Deschutes River upstream of Offutt Lake based on the technical modeling assessment, which as described in Appendix E, simulated natural conditions. The appropriate use of this standard does not result in creation of a new water quality criterion as suggested by the commentor.

See the responses to NWEA's comments 5 and 11 regarding the protection of designated uses in relation to Washington's natural conditions provision. In regard to the comment on the evaluation of climate change impacts to designated and existing uses, see the response to NWEA's comment 54 for a discussion on climate change in the context of the TMDLs.

Comment ID NWEA 56

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

The conclusion that the Deschutes River below Offutt Lake does not need nutrient reductions because minimum DO concentrations are approximately 0.4 – 1.0 mg/L above the numeric criterion is a flawed analysis because the numeric criterion for DO in this portion of the river is not protective of the designated uses. TMDLs Appendix E at 5.5.

Response Text

Numeric water quality criteria are set by the State based on their assessment of protection of designated and beneficial uses. According to 40 CFR Section 130.7(c)(1), TMDLs are required by the CWA and its implementing regulations to be set at levels needed to "attain and maintain the applicable narrative and numerical water quality standards…" Therefore, the TMDLs addressing DO impairment employ the applicable numeric dissolved oxygen criterion of 8.0 mg/L for the Deschutes River downstream of Offutt Lake (as shown in Table 2 of EPA's 2020 TMDL document) associated with the Salmon Spawning, Rearing, and Migration use.

Comment ID NWEA 57

Comment Category *Loading capacity*

Comment Text

The choice of the lowest 1-day minimum DO criterion for headwaters and all tributaries to develop a TMDL scenario for the Deschutes River upstream of Offutt Lake is not protective and EPA has not explained why that is an appropriate way to determine the natural conditions. TMDLs Appendix E at 5.5.

Response Text

Headwater and tributary boundary conditions for DO were set to the lowest 1-day minimum DO standard for the TMDL scenario because these waters are either 1) not listed as impaired and do not exhibit exceedances less than the lowest 1-day minimum DO concentration; or 2) are impaired and a TMDL is being developed to attain water quality standards. This approach is protective because it represents the "worst-case" DO level for waters contributing to the Deschutes River. For additional discussion, see the response to NWEA's comment 6.

Comment ID NWEA 58

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

EPA claims that it is developing TMDLs for "tributaries impaired for low levels of DO, temperature, and/or pH" but it has not, in fact, developed TMDLs for all tributaries that are contributing to the impairment of those parameters. TMDLs Appendix E at 5.5.

Response Text

Under the Clean Water Act, if EPA disapproves a state developed TMDL, EPA must develop a replacement TMDL. As described in the Introduction and in Table 1, EPA's 2020 TMDLs address only those submitted in Ecology's 2015 TMDLs that were disapproved on June 29, 2018. This includes TMDLs for tributaries impaired for DO, temperature, and/or pH included in Ecology's 2015 TMDLs but no others. However, tributary inputs to the Deschutes River were included as part of the QUAL2K model for the TMDLs addressing DO impairment in the

Deschutes River, and their water quality was set at levels to ensure they do not contribute to impairments in the mainstem. See the response to NWEA's comment 52 for additional information about the tributary inputs for the mainstem Deschutes River TMDLs (i.e., including those that do not have separate TMDLs as part of this set).

Comment ID NWEA 59

Comment Category *TMDL Miscellaneous*

Comment Text

The Deschutes River and Capitol Lake are designated critical habitat for Puget Sound Steelhead. See 81 Fed. Reg. 9252, 9303 (Feb. 24, 2016); 50 C.F.R. § 226.212(u)(14). EPA has not evaluated the natural conditions and allocations it has calculated for the Deschutes River and tributaries in these TMDLs pursuant to the Endangered Species Act.

Response Text

Consistent with the requirements in Section 7 of the Endangered Species Act, EPA consulted with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service in connection with its approval of the natural conditions provisions that the commenter references. The consultation included an evaluation of the effects of such provisions on threatened and endangered species, including Puget Sound Steelhead. It resulted in the determination that EPA's approval of such provisions was not likely to jeopardize the continued existence of such species and was not likely to destroy or adversely modify designated critical habitat. EPA's 2020 TMDLs, and the allocations within these TMDLs, are consistent with and written at a level necessary to achieve these already-approved and CWA-effective water quality standards. Therefore, EPA is not required to undergo further consultation or evaluation pursuant to the Endangered Species Act. See *Nw. Envtl. Advocates v. EPA*, No. 3:12-cv-01751-AC, 2018 WL 6524161 at *6-7 (D. Ore. Dec. 12, 2018).

Comment ID NWEA 60

Comment Category *Climate change*

Comment Text

To quote the Department of Ecology concerning other recent EPA TMDLs:

Unfortunately, as a diet, EPA's [Columbia River Temperature TMDL] proposal basically says "just eat healthy" instead of describing how many servings of fruits and vegetables people should strive for.

* * *

We expected EPA to release a plan that would create a path for us to work together to address this regional problem. That didn't happen. EPA's plan lacks clear serving amounts for two of the major contributors: upstream sources and climate change.

Ecology, Blog, What We Do, *EPA plan for Washington and Oregon rivers leaves salmon in hot water* (Aug. 19, 2020). In addition to the reasons listed above, EPA's TMDLs for the Deschutes River likewise fail to include clear serving amounts for upstream sources, namely the drainage basin, and to account for climate change in determining that dissolved oxygen levels in the Deschutes downstream of Offutt Lake will be protected based on temperature and to rely on temperature for the Deschutes upstream of Offutt Lake without taking climate change into account.

Response Text

As discussed in more detail in the responses to NWEA's comments 7, 9, and 52, EPA's 2020 TMDLs do provide loads for upstream sources because the load capacities and allocations are established at the watershed scale for each impaired waterbody segment. Refer to the response to NWEA's comment 54 for a discussion on climate change in the context of the TMDLs.

Commenter David Kangiser, City of Tumwater

Comment ID Tumwater 1

Comment Category *Data for TMDL development*

Comment Text

The majority of this data was collected in 2004, given that this is almost 20 years ago and the effects of development and climate change on the region, this data is likely quite out of date and does not accurately represent the conditions in the Deschutes River and its tributaries now. Newer data should be gathered and used to create a more accurate TMDL.

Response Text

As stated in section 6.3.1, "Most data were collected in 2003 and 2004 to support the model development and are still the most recent data available in the watershed." EPA agrees that more recent data would be desirable, but such data are not currently available. The TMDL regulations make clear that the estimation of load allocations and thus the TMDL itself must proceed even where data are limited: "Load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading" (40 CFR 130.2(g)). In addition, under CWA 303(d)(2), EPA has 30 days to act on a TMDL submitted by a state and, if it disapproves, 30 days thereafter to establish a TMDL. See the response to NWEA comment 16 and 54.

Comment ID Tumwater 2

Comment Category *Editorial/formatting*

Comment Text

The TMDL will need to be re-formatted to avoid unnecessary and irregular page break issues.

Response Text

The TMDL document has been reformatted to address this concern.

Comment ID Tumwater 3

Comment Category *Clarifications*

Comment Text

The name of the new hatchery on the Deschutes needs to be updated from the Pioneer Park Hatchery to the Deschutes Watershed Center Hatchery. Construction of the hatchery at Pioneer Park is not an absolute and a more generic name will help ensure that this document is accurate regardless of where the hatchery is constructed.

Response Text

Information provided by Ecology and Washington Department of Fish and Wildlife to support development of the wasteload allocation (WLA) for the proposed hatchery references it as Pioneer Park Hatchery, which is why EPA designated it as such for the WLA. While EPA recognizes that there is the potential for the hatchery name to change, the WLAs for the planned hatchery are still valid if the hatchery name changes. The same is true for name changes that could occur to other sources in the drainage areas of the waterbodies addressed in the TMDLs (e.g., industrial wastewater dischargers).

EPA also recognizes that the exact location of the hatchery is not currently known. EPA consulted with the Squaxin Island Tribe during the public comment period for the TMDLs. During that time, the Tribe requested that EPA evaluate the sensitivity of the TMDL and allocations to two potential alternate site locations for the hatchery. The potential sites were one mile and one and a half miles upstream of the location modeled for the TMDLs. The model results indicated the applicable DO standard will be attained at the potential alternate locations with no change necessary to any of the allocations. Thus, EPA determined that the hatchery WLA is applicable if the hatchery is located downstream of Offutt Lake.

Comment ID Tumwater 4

Comment Category *Existing temperature TMDLs*

Comment Text

Does the main stem of the Deschutes River no longer have a temperature TMDL on it? In recent years, Ecology's Phase II NPDES permit for the cities of Lacey, Olympia, Tumwater and Thurston Country have required jurisdictions to annually report on the temperature reduction measures that they are completing in the watershed. EPA's TMDL fails to name a target load for temperature on the main stem of the Deschutes River.

Response Text

Temperature TMDLs for the Deschutes River were approved by EPA in June 29, 2018, as discussed in Section 6.1 of EPA's 2020 TMDLs. Refer to Ecology's 2015 TMDLs for the targets and allocations applicable to these entities.

Comment ID Tumwater 5

Comment Category *Source assessment*

Comment Text

Can the Environmental Protection Agency provide a map of the watersheds for the receiving waters and jurisdictional boundaries? The City of Tumwater is identified as being responsible for parts of the Moxlie Creek TMDL despite our records showing no discharges to this basin. If Tumwater does not discharge to this basin, how will this requirement affect us?

Response Text

The MS4 geospatial data used in the TMDLs is available online from Ecology. At the time of this response the correct address is https://ecology.wa.gov/Research-Data/Data-resources/Geographic-Information-Systems-GIS/Data. Under "M" see "Municipal Stormwater Permit Areas" to download the data. Catchment boundaries for the segments impaired for bacteria were defined using NHDPlus V2 (see Appendix D, Table 1). There is a small portion of the southwest Moxlie Creek drainage area that is City of Tumwater land; however, EPA acknowledges this does not necessarily mean there is a discharge at that location. The Tumwater MS4 wasteload allocation in the Moxlie Creek TMDL does not impose any requirements on its own; EPA established the wasteload allocation because a portion of City of Tumwater falls within the basin, but it is Ecology's responsibility to determine if any permit conditions are needed to comply with the TMDL if the City does not discharge to Moxlie Creek.

Comment ID Tumwater 6

Comment Category *Source assessment*

Comment Text

There is concern that no nutrient sampling was completed on tributaries during storm events because it was assumed that only stormwater was discharging. Stormwater can be very high in nutrients especially during first flush scenarios and if it does not receive pre-treatment first. Thurston County Public Health Environmental Health Division completed a Tumwater Stormwater Characterization Project in 2001 that found that the median and maximum values for total phosphorus, total persulfate nitrogen, ammonia, total suspended solids, and fecal coliform bacteria in the stormwater were considerably higher than existing water quality limits or ambient Deschutes River data. Can the Environmental Protection Agency provide documentation that supports the assertion that stormwater does not have nutrients in it?

Response Text

There are multiple places within EPA's 2020 TMDL document where EPA calculates nutrient loads associated with stormwater flows (e.g. Section 4.2 for general stormwater permits, and Section 4.3 for MS4s). EPA does not claim that stormwater does not have nutrients in it. Rather, the TMDL document states that stormwater contributions of nutrients are minimal during dry periods. As discussed in Section 6.4.5, a dry period is defined as a time when there is either no precipitation or there is not adequate precipitation to generate stormwater runoff in the catchments of the stormwater entities. Event mean concentrations of nutrients in stormwater were applied in the estimation of existing loads for stormwater sources (e.g., MS4s) as discussed in Appendix E and Appendix F.

Comment ID Tumwater 7

Comment Category *Load allocations*

Comment Text

There is concern that because the Environmental Protection Agency has no authority to implement nonpoint source controls that sources of nonpoint pollution, such as bank erosion, have been overlooked by this TMDL. Is the assumption that the Department of Ecology's TMDL accurately captured the bank erosion data and was able to make accurate waste load allocations for all sources of nonpoint pollution?

Response Text

As discussed in Appendix C, all sediment sources upstream of the segment impaired for fine sediment are nonpoint sources. The predominate sources include upland erosion, high bank erosion, landslides, and roads. A comprehensive RUSLE-based analysis was used to quantify upland nonpoint source erosion under current conditions and natural conditions. Analyses were previously completed by Ecology to estimate sediment loading from high bank erosion, landslides, and roads. Ecology provided the analyses and data to EPA for development of the

revised fine sediment TMDL for the Deschutes River. Thus, these were applied in the development of the TMDL and informed the allocations for all sources of nonpoint pollution. Allocations are included for bank erosion, so it was not overlooked as a source of sediment.

Comment ID Tumwater 8

Comment Category *Loading capacity*

Comment Text

Since Ecology has adopted E. coli as the indicator for bacteria in freshwater, the TMDL should use E. coli as the indicator for bacterial load for all tributaries and the main stem of the Deschutes River. Fecal Coliform is a more conservative indicator than E. coli. Therefore, if the most stringent criteria should be used, E. Coli would be a better indicator for bacteria.

Response Text

As described in Table 200 (2)(b) within Washington's water quality standards at WAC 173-201A-200(2)(b), the primary contact recreation fecal coliform criteria for freshwater expired on December 31, 2020. The revised criteria apply *E. coli* as the indicator. To provide consistency with the revised water quality standards, the freshwater bacteria TMDLs are established in terms of *E. coli* for Reichel Creek, Spurgeon Creek, Indian Creek, Moxlie Creek, and Schneider Creek. For waterbodies that discharge to marine waters with the designated use of shellfish harvesting, which include Mission Creek, Ellis Creek, and Adams Creek, the downstream standard is more stringent and, therefore, those TMDLs are expressed in terms of fecal coliform. Table 6 in Appendix D compares the applicable designated uses and criteria for bacteria impaired segments with downstream shellfish harvesting and identifies the more stringent geometric mean and single sample targets. A discussion of selection of the most stringent criteria applicable to the waterbodies impaired for bacteria addressed in EPA's 2020 TMDLs is provided in Appendix D.

Comment ID Tumwater 9

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

LOTT Wastewater Management currently discharges to Budd Inlet, putting Budd Inlet into a "Prohibited" status for shellfish harvest. The "Prohibited" designation is re-enforced by the several marinas present in the Inlet. Despite the improvements made to the Deschutes River watershed through this TMDL, Budd Inlet is not likely to be designated for shellfish harvest.

Response Text

The designated use for water quality standard purposes is independent of the "Prohibited" status for shellfish harvesting. Refer to EPA's response to Washington State Department of Health's comment 1 regarding designated uses. Although Washington's designated shellfish harvest use for marine water quality standards is different from the shellfish harvesting status issued by the

WDOH, EPA does not want to cause confusion about the status of shellfish harvesting in Budd Inlet and has added clarification to the Designated Use discussion in Section 3.1 and a footnote to Table 2.

Comment ID Tumwater 10

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

The dissolved oxygen TMDL for Black Lake Ditch will likely be unachievable because the source of Black Lake Ditch is Black Lake. A more comprehensive strategy to address dissolved oxygen deficiencies in Black Lake would be needed to be successful addressing dissolved oxygen in the Black Lake Ditch. We would like to ask that EPA complete an attainability analysis for the dissolved oxygen TMDL on Black Lake Ditch.

Response Text

Under 40 CFR 131.10(g) a State can establish sub-categories of a use that require less stringent criteria if it can be sufficiently demonstrated through a use attainability analysis (UAA) that attaining the designated use is not feasible. As a water quality standard change, EPA's role is to review and approve or disapprove UAA requests, not to conduct a UAA. Should Ecology request a UAA for Black Lake Ditch, EPA will take it under consideration.

Commenter Sue Patnude and Dave Peeler, The Deschutes Estuary Restoration Team

Comment ID DERT 1

Comment Category *TMDL Miscellaneous*

Comment Text

Overall, EPA, based on Ecology's earlier work, has completed this TMDL to a high technical standard. Our primary concerns are with how EPA packaged the technical information into TMDLs, and concerns with their application of the analysis in the regulatory context.

Response Text

EPA appreciates this comment. It is, however, unclear what the Deschutes Estuary Restoration Team Puget Soundkeeper is suggesting related to the presentation and application of the technical information.

Comment ID DERT 2

Comment Category *Downstream water quality protection*

Comment Text

A major flaw in the TMDL is that nutrient limits have been set without considering the impact to Capitol Lake or Budd Inlet. Completing this TMDL without completing the TMDLs for the downstream waters is fundamentally flawed. Statements in this TMDL that nutrient limits are adequate, and that no nutrient limits are needed below Offut Lake, are unsupported and provide a dangerous precedent. The TMDL should be put on hold until the entire package of TMDLs from the Deschutes River through Budd Inlet is complete. Nutrient reductions in the lower Deschutes River may still be necessary to protect Budd Inlet and either Capitol Lake or a restored Deschutes estuary.

Response Text

The statement that the nutrient TMDLs do not consider the impact to Capitol Lake and that no limits are needed below Offutt Lake is inaccurate. As discussed in Appendix B and Sections 3.1, 3.2, and 6.4.2 of EPA's 2020 TMDL document, the TMDLs addressing DO impairment in the Deschutes River are established to be protective of the river and downstream water quality in Capitol Lake, and nutrient TMDLs downstream of Offutt Lake are based on existing loading (which is different than no limit). See EPA's response to NWEA comment 46 for additional discussion on downstream use protection relative to Capitol Lake and nutrients.

EPA recognizes that additional nutrient reductions may become necessary as Ecology develops other downstream TMDLs. Should the allocations for the watershed specified in Ecology's Budd Inlet TMDL be more stringent compared to allocations established in EPA's 2020 TMDLs, then additional reductions may be required within the Deschutes watershed.

Comment ID DERT 3

Comment Category *Source assessment*

Comment Text

The analysis should include evaluation of the hydrology of the river, including gaining and losing reaches, and the effect of flow on dissolved oxygen (DO). Although not regulated under the Clean Water Act, variation in hydrology is still a key environmental stressor than can affect water quality and can be managed through other programs.

Response Text

It is true that changes in streamflow can have significant impacts on instream DO whether due to changes in volume, velocity, depth, or channel geometry. Variation in hydrology is integral to understanding any riverine system. However, the goal of these TMDLs is to consider hydraulics and hydrology relative to the critical low flow condition, which EPA determined is the 7Q10 flow. This ensures the TMDL is protective of worst-case conditions. EPA did factor in flow inputs with two springs represented in the QUAL2Kw model that represent significantly gaining

reaches of the Deschutes River. EPA agrees that hydrology is a key environmental stressor that can affect water quality. In the case of the Deschutes River, it is a factor that should be addressed during TMDL implementation to support attainment of the DO (and other) TMDLs. The importance of increasing summer base flow and strategies for doing this are discussed in the Implementation Plan.

Comment ID DERT 4

Comment Category *Loading capacity*

Comment Text

The "flow-variable TMDL" is provided with little explanation of how it is calculated or justified. Table 31 purports to show a flow-variable TMDL, but it appears to actually show the flow-variable Loading Capacity. The method of calculating flow-variable loading and allocations is not provided.

Response Text

The equations for the flow-variable TMDL show how it is calculated. These can be found directly following Table 31 (e.g., TN TMDL = flow (cfs) x TN target x 2.45 (conversion factor)) for TN and TP. These are also presented and described in Section 6.0 of Appendix E. The justification for the use of the flow-varied TMDL is described in Section 6.4.1 of EPA's 2020 TMDL document; this method inherently accounts for seasonal variation as loads are evaluated across the full flow spectrum. Lastly, the loading capacity is the TMDL (Total Maximum Daily Load), which is equivalent to the sum of the wasteload allocations, load allocations, and margin of safety (Section 1.1 in EPA's 2020 TMDLs).

Comment ID DERT 5

Comment Category *Seasonal variation and critical conditions*

Comment Text

The use of "flow-variable" loading may weaken the TMDL. No evidence is provided that this approach is protective. Either model runs at higher flows should be run and results presented to show that proposed loading is protective, or the critical conditions loading should be applied using seasonal limits.

Response Text

The Deschutes Estuary Restoration Team Puget Soundkeeper states that the flow-variable loading may weaken the TMDLs addressing DO impairment, however, a clear rationale for this claim is not provided. The TMDLs addressing DO impairment for the Deschutes River are based on critical conditions, defined as the 7Q10 flow and 90^{th} percentile air temperature. These critical conditions provide a conservative measure of conditions needed to restore DO water quality standards in the river. TMDLs are required to meet water quality standards and because the

nutrient water quality targets used to calculate the TMDLs are protective of water quality standards under all conditions, EPA disagrees that no evidence is provided that the flow-variable approach is protective. The TN and TP concentrations protective of the river under critical conditions were established through QUAL2Kw modeling. The nutrient loading capacities were developed across the flow profile to ensure year-round protection. If the TMDLs only specified seasonal limits for critical conditions then nutrients could accumulate over the long-term and not be protective when critical conditions occur. The flow-variable approach is consistent with EPA guidance in the memorandum titled, *Establishing TMDL "Daily" Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in* Friends of the Earth, Inc. v. EPA, et al., *No.05-5015, (April 25, 2006) and Implications for NPDES Permits*. The memorandum states "If technically appropriate and consistent with the applicable water quality standard, it may also be appropriate for the TMDL and associated load allocations and wasteload allocations to be expressed in terms of differing maximum daily values depending on the season of the year, stream flow (e.g., wet v. dry weather conditions) or other factors."

Comment ID DERT 6

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

The exclusion of Black Lake from this TMDL report both misses an opportunity to address a 303d listing for total phosphorus (TP), but also neglects a major watershed area tributary to Black Lake Ditch. The TMDL should include an analysis of Black Lake and set a TMDL for the lake and allocations for downstream impairments.

Response Text

The scope of these TMDLs is based on EPA's partial disapproval of Ecology's 2015 TMDL submission as described in EPA's response to NWEA's comment 3.

Comment ID DERT 7

Comment Category *Clarifications*

Comment Text

It would be helpful if EPA would explain in layman terms:

• how these TMDLs in practice will differ from Ecology's, and

• whether as a result of those differences EPA's approach will be more or less protective than Ecology's approach.

This is especially important, as both approaches rely extensively on installation and maintenance of best management practices (BMPs) for nonpoint sources of pollution, and to a much lesser extent on waste load allocations for point sources of pollution.

Response Text

EPA's approach is more protective in instances where EPA's disapproval was based on a lack of downstream use protection, and the downstream standard is more stringent. EPA's 2020 TMDLs set different endpoints for certain TMDLs, or define endpoints (i.e., loading capacity) or allocations for specific sources where they were absent in Ecology's 2015 TMDLs. However, the practices needed to meet the TMDLs are the same, which is why EPA is relying on the Implementation Plan developed by Ecology for the 2015 TMDLs. As with the 2015 TMDLs, the success of the Implementation Plan depends on the extent of actions implemented by stakeholders in the watershed and the use of adaptive management to determine if actions need to be adjusted to attain water quality standards.

Comment ID DERT 8

Comment Category *TMDL implementation*

Comment Text

While we are grateful for the high level of technical research, modeling and analysis that went into preparing both Ecology's earlier TMDLs and these TMDLs developed by EPA, we have a real concern that these reports alone cannot result in much actual improvement in the water quality of the subject water bodies. Ecology has little authority to ensure that BMPs to prevent or remedy nonpoint source pollution are installed and maintained to the degree required by the TMDLs. No oversight agency, group or council exists, has been named or is funded to hold landowners and implementing agencies accountable. Most BMPs are voluntary and funding incentives are quite limited.

This is a widespread problem in many watersheds in our State, but we are acutely aware of the issue in the Deschutes River basin. There is a wide mismatch between the amount of effort spent to develop these TMDLs and the anticipated level of effort to implement them. Unfortunately, we have not seen any movement by the State towards filling this gap. The result is likely to be a technically strong and accurate set of TMDLs that are only partially implemented in a haphazard manner by a small number of willing landowners. We call on EPA to exert their influence on Ecology to use what resources and authorities they have to promote and support a vibrant and effective implementation program for these TMDLs.

Response Text

The comment is correct in noting that TMDLs are not self-implementing. It is Washington's responsibility to determine how best to implement allocations and reliance on voluntary and non-regulatory actions is an acceptable approach for nonpoint sources. A key first step in successful implementation is the development of a practical and collaborative implementation plan. Ecology developed such an implementation plan for the Deschutes watershed, which is contained within its 2015 TMDLs, and is referenced and discussed in EPA's 2020 TMDLs. Table 46 of that Implementation Plan lists potential funding sources for implementation. EPA agrees in the value of having TMDLs being implemented and is working to support development

of implementable the TMDLs and in promoting potential resources, such as 319 Program funding, that may be used for TMDL implementation.

Comment ID DERT 9

Comment Category *TMDL Miscellaneous*

Comment Text

Main TMDL, Section 1. Introduction

This TMDL needs to explicitly state what specifically has been done to replace or supplement the TMDL Ecology submitted. This following table summarizes the differences found in this review, and the apparent effect (either unknown or the judgment of this review). A table like this should be in the report, so these differences are clear to the future reader of this report.

Response Text

This comment is noted but EPA has decided not to include the requested table for the following reasons: EPA's 2020 TMDLs clearly identify the scope of TMDLs being established as a result of EPA's partial disapproval of Ecology's 2015 TMDLs, and for each pollutant EPA describes the analyses conducted by Ecology and maintained in the revised TMDLs, new analyses completed (e.g., evaluation of sheet and rill erosion with RUSLE for the sediment TMDL), methodologies for target development and allocations (e.g., setting nutrient targets for the tributaries impaired for DO and/or pH), and the associated effects of the changes in the main TMDL report and its appendices.

Comment ID DERT 10

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

Main TMDL, Section 1.2, Scope of TMDLs in this Document

a. Listings that this review will address:

Parameter	Waterbody
Fine Sediment	Deschutes River
DO	Deschutes River
	Black Lake Ditch
	Percival Creek
	Black Lake Ditch

b. The current 303d listings on Ecology's website includes listings not approved by EPA and

missing from this report:

Parameter	Waterbody
Total Phosphorus	Black Lake
	Capitol Lake

The TMDL appears to be incomplete without addressing these listings.

• Black Lake is tributary mostly to Black Lake Ditch. (The lake is connected to the Black River only through wetlands.)

• Total phosphorus in Capital Lake is linked to upstream conditions, including sediment.

At a minimum, the TMDL should explain why these parameters were not included.

c. The TMDL should identify other impaired waters resulting from this analysis. For example, the analysis should have identified impairment for sediment from the currently listed segment downstream to Capitol Lake.

Response Text

a. The parameter-waterbody pairs listed in this portion of the comment are addressed in EPA's 2020 TMDLs as specified in Table 1.

b. & c. As described in the Introduction and in Table 1, EPA's 2020 TMDLs address only those submitted in Ecology's 2015 TMDLs that were disapproved on June 29, 2018. See response to NWEA's comments 3, 44 and 58.

Comment ID DERT 11

Comment Category *Seasonal variation and critical conditions*

Comment Text

Main TMDL, Section 4.4.1, Seasonal Variation and Critical Conditions

This discussion misstates the approach to seasonality. The use of an annual average specifically ignores seasonality. A limit for annual sediment loading is reasonable, but seasonality should be addressed by looking at the seasonal variability of high flow events, which are likely to create the highest turbidity. The daily load either should look at higher percent reductions at high flow events or should be expressed as a load-duration curve of daily flows.

Response Text

Because substrate embeddedness is a cumulative long-term process, the average annual load is the most relevant expression of the sediment TMDL, which inherently accounts for seasonality, or differences in flow and sediment loading across different seasons of the year. The TMDL also specifically addresses high flow events with establishment of the daily maximum load computed based on the 95th percentile flow, or flow equaled or exceeded five percent of the time, at Deschutes River near Rainier (Appendix C). Additionally, the turbidity target incorporates

values collected during various flow conditions. For additional information see Section 5.1.1 in Appendix C.

Comment ID DERT 12

Comment Category *Margin of safety*

Comment Text

Main TMDL, Section 4.4.2, Margin of Safety (Sediment TMDL)

a. The use of "conservative assumptions" is not supported by the documentation. The only conservative approach was the use of two methods to pick a more restrictive target.
b. Statistical method does not really provide a margin of safety – the confidence band around the regression between turbidity and TSS suggests that turbidity may be much higher for any given TSS event that the regression used for the TMDL suggests.
c. The description of the upland source assessment does not support the assertion of conservative assumptions. The rainfall used appears to be average values. If conservative literature values support an erosive year, this should be specifically described.
d. The margin of safety is not supported by the use of the 95th percentile flow for determining the TMDL. The use of a high flow with the concentration target results in load equivalent to much higher TSS levels at lower flows. This is a non-conservative approach. (See comment above regarding seasonal variation.)
e. The margin of safety does not address climate change. Increased intensity of winter rainfall may increase erosion.

Response Text

a. EPA disagrees with comment a. As described in Section 4.4.2, in addition to the selection of the most stringent target, a conservative statistical approach was applied during development of the turbidity target and conservative assumptions are incorporated into the upland source assessment. For example, the upland sheet and rill erosion analysis assumed no implementation of erosion mitigating conservation practices (Section 2.2.5 in Appendix C).
b. As can be seen on Figure 18 of Appendix C, the use of the 95^{th} percentile confidence interval on the regression results in a smaller increase, and thus smaller allowable TSS load, per increase in 5 NTU. For example, at a background turbidity of 10 NTU, the corresponding TSS values at the allowable level of 15 NTU are 35 mg/L at the lower bound of the mean confidence interval, 32 mg/L at the mean, and 30 mg/L at the upper bound of the mean confidence interval. Use of the upper bound of the mean confidence interval is conservative because the corresponding allowable TSS concentration is lower.
c. The margin of safety statement referencing the upland source assessment being more reflective of a highly erosive year is incorrect and has been revised. However, high rainfall events, which exacerbate upland erosion, were observed over the multi-year analysis period and included in the computations to develop the isoerodent (i.e., runoff/rainfall erosivity) map and estimate of sediment loading from upland erosion. As noted in response a, the upland source assessment was conservative in assuming no erosion mitigating conservation

practices are in place.

d. The TMDL is based on the 95th percentile flow, which is the flow equaled or exceeded 5 percent of the time. Therefore, the TMDL represents a load that should not be met or exceeded more than 5 percent of the time (Appendix C). The value was presented as such to identify a maximum daily load, as required, but the TMDL is also expressed as an annual load because that was determined to be the most appropriate expression of the sediment TMDL. Therefore, both conditions must be met. If the daily maximum of 50.8 tons is multiplied by 365 days, the result is 18,542 tons, which is much greater than the annual load capacity of 5,202 tons/year, and demonstrates that the maximum value is not an acceptable daily load for much of the year. The statement "The use of a high flow with the concentration target results in load equivalent to much higher TSS levels at lower flows." is not accurate. The load is subject to vary with streamflow; however, the concentration target is appliable to all flow conditions (i.e., concentrations are not allowed to be higher for lower flows). Additionally, the turbidity target as identified in Section 4.4.3 is applicable.
e. See EPA's response to NWEA's comment 54 for a discussion on climate change in the context of these TMDLs. Impacts of climate change on practice effectiveness and the ability of collective measures to meet the targets, potentially under altered storm intensity, may be assessed by the State and inform adjustments over time.

Comment ID DERT 13

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

Main TMDL, Section 4.4.4, Reserve Allocation

a. The impairment documented by the 303d listing upstream almost certainly continues downstream to the mouth of the river. Therefore, wasteload allocations should be provided to all point sources in the Deschutes River basin likely to be sources of sediment, including stormwater, gravel pit, and construction general permits. TMDL calculations should address these sources and set a TMDL target for the mouth of the river.
b. Providing no waste load allocations for sediment effectively bans all point sources to the Deschutes River. Is this what EPA intended?
c. Since the high levels of sediment come from nonpoint sources, no reserve allocation should be provided for sediment. However, a "de minimus" allocation for point sources would be reasonable for small amounts less that the measurement variability.

Response Text

a. The fine sediment impairment on the Deschutes River has the listing ID 6232, which does not extend to the mouth of the river. The upper portion is just downstream of Lake Lawrence east of Vail Road SE and the segment ends between Woodbrook Lane SE and Vail Loop Road SE. Ecology's 2015 TMDLs included allocations at the watershed scale, but did not cite the lower portion of the Deschutes River as unlisted but impaired, nor has it been added

as impaired for sediment to subsequent 303(d) lists. Additionally, as discussed in the response to NWEA comment 3, the scope of EPA's 2020 TMDLs are limited to those TMDLs disapproved within the 2015 TMDLs.

b. As discussed in Section 4.3.2., there are no permitted point sources within the portion of the watershed draining to the sediment-impaired segment. Therefore, no wasteload allocations are provided because there are no existing point sources. Additionally, as discussed in Section 4.4.4., the likelihood of future permits is low; however, EPA established a reserve capacity to account for possible future development. The reserve allocation may be allocated to future point sources.
c. This comment is noted but EPA is not changing the reserve allocation for sediment based on this comment. As noted in Section 4.4.4., the reserve allocation is to account for possible future development. Reserve allocations may be used for point or nonpoint sources.

Comment ID DERT 14

Comment Category *Load allocations*

Comment Text

Main TMDL, Section 4.4.5, Load Allocations

As discussed above regarding seasonal variation and margin of safety, the proposed load allocations are not protective of water quality standards in the Deschutes River. The load allocation should include additional factors of safety for the seasonality and variability at the daily scale of high turbidity events; higher rainfall intensity from climate change; and the variability of the TSS-turbidity relationship.

Response Text

See EPA's response to NWEA comment 7 regarding the multiple ways in which the sediment TMDLs accounted for seasonality. Because substrate embeddedness is a cumulative, long-term process, the average annual load is the most relevant expression of the TMDL. However, as daily loads are required for TMDLs, a maximum daily load is also specified based on the 95th percentile flow (flow equaled or exceeded five percent of the time). The combination of the annual load and the total maximum daily load addresses high turbidity events, variability, and conditions under higher rainfall intensity. This is discussed in the TMDL document in Section 4.4.1 and throughout Appendix C. See EPA's response to NWEA's comment 54 for a discussion on climate change in the context of these TMDLs.

Comment ID DERT 15

Comment Category *Water quality attainment*

Comment Text

Main TMDL, Page 51, Section 6.2

"Based on the results of this model scenario, EPA determined the nutrient targets for the portion of the Deschutes River upstream of Offutt Lake that would result in DO water quality standards being attained." See comments below on Appendix E. The analysis failed to adequately address a reach above Offut Lake where DO deficit exceeded the 0.2 allowable deficit.

Response Text

It is considered best practice to temporally and spatially aggregate model predictions to a reasonable scale to account for uncertainties (e.g., theoretical methods employed in the platform, calibration robustness based on data availability and performance). Results from the QUAL2Kw model were aggregated to sections of the river spanning a few kilometers in length, although non-aggregated results are depicted in Figure 25. There is a small section of the river about five kilometers upstream of Offutt Lake that is slightly below the target, by < 0.05 mg/L; this occurs under conservative critical conditions of 7Q10 flow and high air temperatures. Furthermore, the DO standard is written to the tenths decimal place (e.g., daily minimum of 9.5 mg/L upstream of Offutt Lake) and the model predicted deviation is to the hundredths decimal place, thus, is more precise compared to the criteria. EPA determined that aggregation at this scale is appropriate given inherent uncertainty in the water quality data and modeling analyses, and that the analyses were conducted to ensure all impaired sections of the Deschutes River, including the segment referenced that spans from Silver Spring to Tempo Lake Outlet, achieve the water quality standard.

Comment ID DERT 16

Comment Category *Seasonal variation and critical conditions*

Comment Text

Main TMDL, P. 56, Section 6.4

a. "…due to negligible contributions from runoff)." Poor wording, replace with "less runoff in the dry season."
b. "…critical conditions and seasonal variation in loading is addressed by establishing flow-variable nutrient TMDLs." No evidence is provided to show that a flow-variable nutrient TMDL is protective. More typically in TMDLS, the loading for a critical season is set to critical conditions and seasonal limits established.

Response Text

a. The suggested edit has been made to the TMDL document.
b. See response to DERT's comment 5.

Comment ID DERT 17

Comment Category *Loading capacity*

Comment Text

Main TMDL, P. 56, Section 6.4

In addition, it is not clear what is exactly meant by a "flow-variable TMDL". The values shown in Table 31 appear to be for "flow-variable loading capacity". The TMDL is the sum of allocations, and no explanation is provided for how allocations would be calculated to be flow-variable.

Response Text

A flow-variable TMDL means that the loading capacity for TN and TP varies according to flow in the Deschutes River. The relevant equations are presented in Appendix E, Section 6, and in Section 6.4.2 of the main TMDL document. As stated on page 42 in Section 6.4.2, the equations can also be applied to define the allocations; this is because the allocation for sources other than the hatchery are equal to the flow from those sources multiplied by the target and conversion factor. The simplification of this from an implementation perspective is explained below the equation on page 43 for the TMDL but also applies to the allocations: "This means that at any given flow, the TMDL is met if the water quality target is met."

Comment ID DERT 18

Comment Category *Margin of safety*

Comment Text

Main TMDL, P. 59, Section 6.4.4

The second bullet at the end of this section ("The numeric temperature and DO criteria…") does not make sense and should be deleted. The criteria are based on a daily maximum or minimum, so the statement about "hourly basis" would not apply.

Response Text

The commenter is correct about the water quality criteria not varying hourly; however, the bullet referenced in the margin of safety is about the input values for water temperatures and DO concentrations of the headwaters, tributary, and diffuse sources in the QUAL2Kw model. This is conservative because the inputs were set at the criteria values for all hours of the day, although it is much more likely that daily variations in water quality will only result in values at the criteria during a portion of the day. In other words, the loading capacity for DO for the Deschutes River was identified with the inclusion of inputs that were characterized as being warmer with less oxygen than they are expected to be, which is conservative because it tends to overestimate to loading from these sources and reduces assimilative capacity within the river. This was clarified in the margin of safety in Section 6.4.4.

Comment ID DERT 19

Comment Category *Margin of safety*

Comment Text

Main TMDL, P. 59, Section 6.4.4

As noted above, the use of a flow-variable allocation may wipe out any benefit from implicit margins of safety. It is a "Margin of Un-safety".

Response Text

EPA disagrees that a flow-variable TMDL wipes out the margin of safety. See response to DERT's comment 5 for additional information on the flow-variable approach. The discussion of the flow-variable approach can be found in Section 6.4 of EPA's TMDL document and the margin of safety is discussed in Section 6.4.4.

Comment ID DERT 20

Comment Category *Load and wasteload allocations*

Comment Text

Main TMDL, P. 60, Section 6.4.5

a. "All WLAs except those given to the fish hatcheries vary by stream flow, as explained in Section 6.4.1." No explanation is provided on how flow-variable WLAs are calculated. Section 6.4.1 refers to a "flow-variable TMDL". This apparently is the Loading Capacity in the river itself. The variable flows used for WLAs are not explained.
b. "Discharges from MS4s and other permitted stormwater entities are negligible…" This is not necessarily true. From direct observation I can attest that a summer storm on impervious surfaces can produce a stormwater discharge in the dry season, at a time when dilution is low and impacts may be greatest.
c. P. 61, Table 33: allocations are set for average daily Streamflow in the river, but no explanation is provided for how flow for each of these sources is determined. The TMDL narrative suggests that the loading is weighted by the river flow. This may be an assumption that is not protective, since some sources may have flows that correlate poorly or are completely independent of river flows. For example, a summer storm in an urban area with impervious surfaces may exhibit high flows while the flows in the river receiving that discharge are still relatively low.
d. Page 69, Table 35: allocations for tributaries are based on a weak analytical method (see comments on Appendix F). Given the importance of reducing loads in the mainstem Deschutes River, Capitol Lake, and Budd Inlet, a more rigorous analysis is needed to assess loading targets.

Response Text

a. See responses to DERT comments 4, 5, and 17.
b. A definition of a dry period is provided in Section 6.4.5, which explains that a dry period is a time when there is either no precipitation or not adequate precipitation to generate discharges from stormwater runoff. A precipitation event that produces stormwater runoff is not considered a dry period and EPA agrees those discharges are not necessarily negligible, which is why stormwater was included in the source assessment and provided wasteload allocations.
c. The explanation for how the flows and loads for each of these sources was computed is in Appendix E, Section 4. Equations, data sources, and results are provided for each source. As described in Section 4.2, loads for facilities covered under the General Permits for Sand and Gravel Stormwater, Industrial Stormwater, and Construction Stormwater were calculated from annual runoff (i.e., not streamflow) on the facility footprint and representative Event Mean Concentrations. As discussed in EPA's response to DERT comment 17, allocations are based on flow from that source and not weighted by river flow as suggested in the comment.
d. EPA disagrees that the allocations for tributaries are based on a weak analytical method. See EPA's response to DERT comments 41 and 42 for details on EPA's approach and why EPA determined it is appropriate for the tributary TMDLs.

Comment ID DERT 21

Comment Category *Clarifications*

Comment Text

Main TMDL, P. 77, Section 7.3.3.2

a. The first paragraph refers to "nutrient water quality targets". If these are the targets defined in Appendix, that needs to be stated.
b. The first sentence of the second paragraph does not make sense. The phrase "there are no point sources permitted to discharge anything other than stormwater" is difficult to decipher, and it's not clear why the absence of storm event makes monitoring data representative.
c. P. 78, Figures 7 and 8: cite appendix F.

Response Text

a. The targets are defined earlier in Section 7 within Sections 7.1 Technical Approach and 7.2 Numeric Targets.

b. The statement about the data being representative was within the context of the source assessment and the contribution from nonpoint sources. Because the only permitted point sources on tributaries discharge during storm events generating runoff, the statement was made to emphasize that water quality data is not expected to include contributions from point sources and is only nonpoint sources. EPA has clarified the statement to state, "the monitoring data are considered representative of nonpoint source contributions during periods when there is no stormwater runoff."
c. The TMDL document has been revised to cite Appendix F.

Comment ID DERT 22

Comment Category *Margin of safety*

Comment Text

Main TMDL, P. 80, Section 7.4.2

The use of reference values for nutrient targets should not be considered conservative assumptions. No information is available to determine whether these targets are accurate or biased high or low.

Response Text

Ambient nutrient targets were derived by ecoregion in USEPA, 2000. These reference conditions reflect "pristine or minimally impacted waters" and are therefore conservative from the perspective of water quality protection and restoration. Data and the approach used to derive the targets can be found in Appendix E, Appendix F, and USEPA, 2000.

Comment ID DERT 23

Comment Category *Loading capacity*

Comment Text

Main TMDL, P. 82, Section 7.4.4.2

a. The same concerns about flow-varied loads as expressed for the mainstem DO TMDL apply here – no evidence is provided to show that the approach is protective, and the method of calculating loads is not clear.
b. Flows used to calculate loads were developed with a weak methodology (see comment below for Appendix F).

Response Text

a. Refer to the response to DERT's comment 5 that discusses the flow-variable TMDL approach. The equations used to calculate the loads can be found in Section 7.4.4.2 for both TN and TP. A discussion of the derivation of the nutrient concentrations applied in these equations can be found in Appendix F.

b. We disagree with the commenter regarding the weak methodology. The water quality target concentration is the same under various flows (see Table 35 and equations in Section 7.4.4.2). Observed flows can be used to evaluate attainment, which is not dependent on the flow estimates or underlying methodologies.

Comment ID DERT 24

Comment Category *Downstream water quality protection*

Comment Text

Appendix B – Capitol Lake Designated Use Evaluation

a. The retention time determined for Capitol Lake is just below the value for being defined as a "lake". Since the lake is losing volume over time, this approach is conservative in that sense. However, if the lake were dredged, it might have sufficient volume to qualify as a lake. This would make the water quality criteria that apply much more stringent, which also might be considered as conservative. DERT will have to decide which version of "conservative" they prefer. Considering the geophysical, hydraulic, ecological state of the lake, considering it to be a "run of the river reservoir" seems appropriate.
b. It is not clear why this appendix is included, since the TMDL ends before entering the "lake".

Response Text

a. Thank you for this comment. EPA's evaluation of Capitol Lake is based on current conditions. As noted in the response to NWEA's comment 43, EPA updated the retention time calculation for the final TMDLs but the conclusion is the same as the public noticed TMDLs in that it does not meet Washington's definition of a lake.
b. Appendix B is included to evaluate protection of downstream waters within the context of the Deschutes TMDLs, and EPA used the current condition of Capitol Lake in its evaluation.

Comment ID DERT 25

Comment Category *Clarifications*

Comment Text

Appendix C – Deschutes River Fine Sediment Technical Analysis

This appendix would benefit from some basic background information regarding geology and soil types. This context would support and clarify the rest of the analysis.

Response Text

As referenced in Section 2.1 of the TMDL document, this type of information is contained in Ecology's 2015 TMDLs.

Comment ID DERT 26

Comment Category *Climate change*

Comment Text

Appendix C – Deschutes River Fine Sediment Technical Analysis

Rainfall-runoff erosivity factor (R) and climate change – increased erosion from more intense winter rainfall

Response Text

EPA acknowledges there is a risk that intensity of winter rainfall events may increase under future climate conditions; however, the adaptive management approach to addressing climate change is discussed in NWEA comment 54.

Comment ID DERT 27

Comment Category *TMDL implementation*

Comment Text

Appendix C – Deschutes River Fine Sediment Technical Analysis

In general, the method is probably the best that can be used with the spotty and variable data set available. An adaptive management approach should be employed with a rigorous monitoring program to test assumptions and progress in reducing fine sediment.

Response Text

As discussed in Section 8 of the TMDL document, Ecology's 2015 TMDLs contain an Implementation Plan that discusses Ecology's plans to conduct effectiveness monitoring, evaluate progress towards milestones, and use adaptive management to adjust strategies as needed to achieve the goals set forth by the Deschutes TMDLs. This approach applies to all parameters addressed by the TMDLs, including sediment.

Comment ID DERT 28

Comment Category *Clarifications*

Comment Text

Appendix E – Deschutes River Mainstem Dissolved Oxygen TMDLs Technical Analysis

a. General comment: The discussion in this appendix is confusing because it's not clear which work Ecology did and which work EPA has done to supplement their work. The report should be rewritten to make it very clear which parts are from the original Ecology work, and what EPA is adding to the report.
b. Page 1, 1.0 Introduction: Review for grammar – many errors. For example, "sources of dissolved oxygen (DO)" and redundant sentences near the end of the paragraph.

Response Text

a. Throughout Appendix E the analyses are described as either being completed by Ecology or by EPA. As described in Section 5.1, Ecology developed and calibrated the QUAL2Kw model and simulated natural conditions for temperature in the Deschutes River. As described in Sections 5.3.2 and 5.5, EPA applied the QUAL2Kw model to simulate natural conditions for DO, quantify the nutrient-dissolved oxygen stressor-response relationship, and simulate the DO TMDL scenario.
b. EPA has revised the "sources of dissolved oxygen (DO)" statement to instead state, "quantifying key stressors that influence dissolved oxygen (DO) levels in the mainstem of the Deschutes River." EPA also made other editorial revisions to improve readability.

Comment ID DERT 29

Comment Category *Clarifications*

Comment Text

Appendix E – Deschutes River Mainstem Dissolved Oxygen TMDLs Technical Analysis

a. Clarify the boundaries of the model. Figure 1 shows Capitol Lake as part of the basin, but the narrative suggests that modeling ends where the river enters the lake backwater (foot of Tumwater Falls).
b. Page 3, Table 2: explain the caption. Is this the entire drainage from the downstream end of each impaired reach? "Cumulative" means each upstream reach is included in the downstream reach?
c. Page 4, Flow and Water Chemistry Data: include a paragraph about seepage runs and gaining/losing reaches.
d. Page 7, Table 4 and 5: List the number of non-detects and explain how non-detects were handled when calculating the mean. It would be better to show min, mean and max on these tables.

Response Text

a. Capitol Lake is part of the Deschutes River watershed, which is shown in Figure 1. The QUAL2Kw model extent is shown in Figure 4.
b. Cumulative means the entire drainage area of the segment, so it includes upstream reaches as well.
c. As described in Section 2.2 of Appendix E, observed groundwater DO data were applied by Ecology to represent major springs as well as diffuse groundwater conditions in the QUAL2Kw model. For example, the Spring at Route 507 and Silver Spring are two major gaining locations along the Deschutes River; these are explicitly represented in the QUAL2Kw model (Table 22). On page 116 of Ecology's TMDL Technical Report (12-03-008), net diffuse inflows (i.e., due to loosing and gaining locations) were calculated using streamflow records at USGS gages.
d. Detection limits were often not available for constituent samples; therefore, the mean was

computed based on the reported value. The intent of the summary tables was to show the typical nutrient concentrations observed at these locations. Thus, the mean is listed for each site and constituent of interest.

Comment ID DERT 30

Comment Category *Downstream water quality protection*

Comment Text

Appendix E, P 10, Section 3.0

First paragraph: This paragraph is not accurate and should be deleted. DO is affected far field by pollutants. Pollutants entering the Deschutes River from above Offut Lake could impair the river below Offut Lake even if the DO criteria are being met above Offut Lake. Likewise, even if the Deschutes River above Capitol Lake is meeting criteria, pollutants from the river could impair Capitol Lake.

Response Text

As evidenced by the dissolved oxygen sag curve (Streeter Phelps model), the critical point or point of maximum allowable oxygen deficit is nearer the point of pollution and recovery occurs thereafter. Controlling pollution above Offutt Lake will reduce delivery of stressors (e.g., nutrients) to downstream waters. These efforts will also ensure that oxygen levels in the upper river are higher than the criteria applicable to the lower river and Capitol Lake (i.e., greater than the lowest 1-day minimum DO of 8 mg/L); this eliminates a DO deficit, or rather ensures a DO surplus, at the boundary location. Nevertheless, the QUAL2Kw model evaluated dissolved oxygen conditions in the river upstream and downstream of Offutt Lake and targets were established to meet the criteria (Table 24 and Section 6 in Appendix E). Protection of Capitol Lake is discussed in Section 3 and Appendix B of EPA's 2020 TMDL document.

Comment ID DERT 31

Comment Category *Clarifications*

Comment Text

Appendix E

In general, Section 3.0 is difficult to understand. Is the report presenting results before it presents the analysis to achieve them? This section needs to be rewritten to be comprehensible.

Response Text

Section 3 describes EPA's approach to identifying water quality targets for the TMDLs addressing DO impairment in the Deschutes River because they are a foundational element of the TMDLs. It provides context for the data reviewed in Section 4, but it is not presenting the results

before the analysis. Additionally, other appendices with supporting technical information for Deschutes TMDLs are organized in this manner to provide a consistent organization for readers.

Comment ID DERT 32

Comment Category *Natural conditions*

Comment Text

Appendix E, P 41, Section 5.3

The report should avoid using the term "natural conditions". State standards define "natural conditions" as absent human-caused pollution. Many human impacts have changed conditions and may be impacting DO. In particular, changes in the hydrology of the basin may be having a large impact on river flows and DO. Some discussion should be provided about what factors were estimated for natural conditions, and what factors may affect DO but were not addressed in this report.

Response Text

The term "natural conditions" is used within the main body of EPA's 2020 TMDL document and Appendix E for instances when Washington's natural conditions provisions are relevant to TMDL development. The natural conditions provisions are described in Section 3.2. As described in Section 5.3.2 of Appendix E, natural conditions were defined for water quality inputs for the headwaters, tributaries, diffuse groundwater inflows, and spring inflows based on historical records, long-term monitoring, geological data, reference watersheds and literature reviews. The specific parameters included are listed in Tables 19, 20, and 21 of Appendix E. The natural conditions for water temperature were maintained from Ecology's simulations in its 2015 TMDLs, which included system potential vegetation shade for the mainstem and tributaries, cooled riparian microclimate, and stream stabilization characterized as a narrowed width. Information to quantify changes to watershed hydrology and, in particular, low summer streamflow was not available nor was a watershed model available to simulate hydrologic impacts of human activities in the drainage area. Although flow changes were not explicitly incorporated into the model, as discussed in EPA responses to DERT comment 3, flow is discussed as part of the Implementation Plan.

Comment ID DERT 33

Comment Category *Editorial/formatting*

Comment Text

Appendix E.

a. P 41, Section 5.3: The reference to Table 23 here appears to be an error.
b. P 42, Figure 17: red shading appears to be in the wrong locations.
c. Pp 44-46, Tables 19-21: label CBOD as 5-day or ultimate.

Response Text

a. The reference is correct. The conditions for the three scenarios – natural conditions for temperature, natural conditions for DO, and the DO TMDL - are summarized in Table 23.
b. EPA has corrected the shading in Figure 17.
c. EPA updated the labels to specify it is CBOD ultimate.

Comment ID DERT 34

Comment Category *Data for TMDL development*

Comment Text

Appendix E, P 45, Table 20

"Natural" ground water CBOD and TP seem rather high. TP is not very mobile in ground water, and CBOD is likely to be less than detection as background, and mostly dissolved. In addition, these values are surprisingly higher than the headwaters, that are presumably background groundwater-derived baseflow. The ground water data used should be reviewed. The median reference condition may not be appropriate, depending on the sources and distribution of the data set.

Response Text

As described in Table 20, the approximated natural conditions for nitrogen and phosphorus in groundwater are based on the median reference concentration presented in the 1998 USGS report "Hydrology and Quality of Ground Water in Northern Thurston County, Washington". Data were not available for CBOD. Stoichiometric ratios were used to approximate CBOD from TP as described in Table 20. The headwater nutrient conditions were derived from a USEPA (2000) report applicable to surface waters, "Ambient Water Quality Criteria Recommendations: Information Supporting the Development of State and Tribal Nutrient Criteria for Rivers and Streams in Nutrient Ecoregion II Western Forested Mountains." Specifically, the 25th percentile concentration from data within the Cascades ecoregion were applied for the headwaters. At the time of TMDL development, these were the best references available for determining natural nutrient concentrations in groundwater, diffuse flows, and the headwaters.

Comment ID DERT 35

Comment Category *Clarifications*

Comment Text

Appendix E, P 49, Section 5.4.

This section is interesting. Explain how it factors into determining the TMDL.

Response Text

The stressor response section quantifies the relationships between nutrient (TN and TP)

concentrations and dissolved oxygen levels in the river. The main point of this section is that lower ambient nutrient concentrations are shown to improve the minimum DO concentration in the river, indicating the importance of establishing nutrient targets for the TMDLs. Subsequent QUAL2Kw modeling scenarios were used to derive the TMDL nutrient targets for the upper and lower river (Section 5.5 and Section 6 in Appendix E).

Comment ID DERT 36

Comment Category *TMDL Miscellaneous*

Comment Text

Appendix E, P 49, Section 5.4.

Conduct a stressor assessment of summer low flow. What would the effect be of increased flow in the Deschutes River. A recent Masters thesis from TESC sheds light on the loss of flow and could be the basis of choosing the amount and locations of flow impacts. The effect of increasing flow in gaining reaches and reducing the loss of flow in losing reaches should both explored.

Response Text

EPA did not conduct a stressor assessment isolating the effects of increasing baseflow or reducing the loss of flows to specific reaches of the Deschutes River, but the TMDLs are established at levels necessary to meet DO water quality standards during seasonal variations in flow and critical low flow conditions. Regarding the effect of increased flows, Ecology's 2015 TMDLs and EPA's 2020 TMDLs both evaluated the impact of increased baseflows over the entire length of the Deschutes River in the QUAL2Kw model scenario 5. Management actions for improving baseflows are discussed in Ecology's Implementation Plan for the 2015 TMDLs. Figures 10 and 12 in Ecology's 2015 TMDLs show the predicted 7-day average daily maximum temperature and decrease in peak temperature by river kilometer associated with improvements in baseflow to the entire river (Scenario 5).

EPA agrees that improvement in summer baseflow is an important aspect of improving water quality. Reduced baseflows caused by humans (including as a result of climate change) negatively impact water temperature in the Deschutes River. This in turn, impacts nutrient levels in the river. Scenario 5 from Ecology's 2015 TMDL document, which was applied by EPA for the 2020 TMDLs as the baseline natural conditions temperature model simulation, estimated that improving baseflow by 20 to 40 percent would decrease maximum temperatures throughout the system by 0.29ºC (p. 29, Ecology's 2015 TMDLs).

The stressor assessment referenced in the comment could be an important aspect of TMDL implementation to prioritize areas to increase flow or reduce flow losses. However, EPA's 2020 TMDL analysis focused on determining the allowable level of nutrients in order to meet applicable water quality standards, using Ecology's EPA-approved 2015 temperature TMDLs as the baseline natural temperature conditions. Since overall baseflow improvements were part of that baseline, EPA did not further evaluate flows for its 2020 TMDLs, but rather focused on the level of nutrient reductions needed to improve DO conditions in the river to achieve applicable

water quality standards.

In Section 6.2 of the TMDL document and Sections 3.0, 5.1, and 5.3 of Appendix E, EPA added clarifying language about the model scenario used, as well as additional text about improved baseflows, which was referenced in Section 7.3.2.1 but inadvertently left out of the model scenario description in EPA's 2020 TMDLs released for public comment.

Comment ID DERT 37

Comment Category *Downstream water quality protection*

Comment Text

Appendix E, P 52, Section 5.5

a. "There is no need to require nutrient load reductions downstream of Offutt Lake because the numeric Water Quality (WQ) criterion is met with a wide margin of error under existing nutrient levels": Since the analysis did not include modeling of impacts on Capitol Lake, this statement seems unsupported. There is no need to reduce nutrients below Offut Lake to meet the criteria between Offut Lake and Capitol Lake, but the analysis has not been determined if nutrients need to be reduced to allow Capitol Lake to meet DO criteria and address its listing for TP, or to allow Budd Inlet to meet DO standards.
b. "…there is small section of the river about five kilometers upstream of Offutt Lake that is slightly below the target, by <0.05 m/L. For the TMDL evaluation, results are aggregated to sections of the river spanning a few kilometers in length. Overall, this segment (Silver Spring to Tempo Lake Outlet) achieves the target concentration for the TMDL.": Simply aggregating the reach so the problem "goes away" is not appropriate – 0.2 mg/L has already been allowed, and allowing more is not in compliance with the standards.

Response Text

a. The analyses of the Deschutes TMDLs did consider the impacts on Capitol Lake. See Appendix B and Sections 3.1 and 3.2 of the TMDL document and the response to DERT's comment 24. The Deschutes River TMDLs addressing DO impairment are established to be protective of the river and downstream water quality in Capitol Lake. Should the allocations for the Deschutes River watershed specified in Ecology's Budd Inlet TMDL be more stringent compared to EPA's 2020 Deschutes River TMDLs addressing DO impairment, then additional reductions may be required within the Deschutes watershed.
b. EPA disagrees that results were aggregated in such a way to make the problem "go away." Refer to EPA's response to DERT comment 15 regarding model aggregation and why EPA concluded the TMDL is established at a level necessary to attain the water quality standard within the segment referenced in the comment, as well as the entire assessment unit.

Comment ID DERT 38

Comment Category *Clarifications*

Comment Text

Appendix E, P 52, Section 5.5

a. Since the TMDL was aggregated by river sections, show those sections in Figure 25, explain how those sections were chosen, and explain how DO results were "aggregated".
b. More analysis of DO results for each reach should be provided. What is the physical driver of lower DO in these reaches? How do gaining and losing reaches affect DO concentrations?

Response Text

a. The TMDLs were aggregated upstream and downstream of Offutt Lake based on the applicable designated uses and criteria. Figure 25 in Appendix E marks the location of Offutt Lake for reference. The three segments downstream of Offutt Lake that are impaired for DO are in series. A description of the aggregation is provided in Section 3.0 of Appendix E and Section 6.2 of EPA's 2020 TMDL document.
b. EPA's modeling analyses built on those completed by Ecology for their 2015 TMDLs, which evaluated overall drivers of the DO dynamics within the Deschutes River. Drivers include shade, microclimate, and tributary water temperatures, DO levels, and nutrient concentrations, for example. Based on simulating conditions associated with Ecology's temperature TMDLs as a baseline, nutrients were identified as the biggest driver for DO. The stressor response relationship between nutrients and DO for the Deschutes River upstream and downstream of Offutt Lake is discussed within Section 5.4 of Appendix E and shown in Figures 21 – 24. Major springs, including near Route 507 and Silver Spring, are explicitly represented in the QUAL2Kw model, but evaluating the relative contribution of various drivers within each reach is outside the scope of the TMDLs. As described in Section 2.2 of Appendix E, observations of groundwater conditions generally suggest that resurfacing groundwater is anoxic, thus, negatively influencing stream DO concentrations. The dips in DO concentrations between Reichel Creek and Offutt Lake shown in Figure 20 (Appendix E) are attributed to these springs.

Comment ID DERT 39

Comment Category *Downstream water quality protection*

Comment Text

Appendix E, P 56, Section 6.0

"…there are no reductions in existing nutrient loads required because the thermal loads assigned in Ecology's Deschutes River temperature TMDL are shown to result in the achievement of the applicable DO criteria.": As mentioned in a previous comment, this statement is not accurate

because the downstream standards and the TP 303d listing for Capitol Lake and the protection of Budd Inlet are not addressed in this TMDL.

Response Text

Refer to the response for DERT's comment 37 regarding protection of Capitol Lake and Budd Inlet in the Deschutes TMDLs.

Comment ID DERT 40

Comment Category *Load allocations*

Comment Text

Appendix E, P 56, Section 6.0

"TMDLs are expressed as flow-varied loads based on the TN and TP concentration targets …" and "Thus, the nutrient loads downstream of Offutt Lake are established based on existing average ambient concentrations…": No explanation is provided for why the concentration is the target and loads can increase with flow. Has this assumption been tested with scenarios at higher flow? If so, this analysis should be shown. If not, this approach has no basis. In past TMDLs, a load was set at critical conditions to ensure a margin of safety. No evidence is provided that a flow-varied load provides a margin of safety. Alternatives should be explored, such as seasonal loading limits.

Response Text

Refer to the response to DERT's comment 5 that discusses the flow-variable TMDL approach.

Comment ID DERT 41

Comment Category *Loading capacity*

Comment Text

Appendix F, P. 23, Section 3.4

a. The use of "nutrient targets" based on ecoregion value seems like a very weak way to protect DO and pH. No analysis has been provided to link DO and pH response to nutrient loads. As a result, no margin of safety can be determined, and reasonable assurance seems impossible to certify.
b. On top of the weakness of this surrogate approach, these targets are not evaluated to determine if Black Lake Ditch and Percival Creek nutrient levels will be protective of Capitol Lake and Budd Inlet.

Response Text

a. As described in Section 3.4 of Appendix F, nutrient targets were derived from recommended criteria for Level III ecoregion reference streams for tributaries impaired for DO and pH because nutrient biogeochemical processes were found to be a critical stressor in addition to

water temperature, as discussed in Section 7.1.2 in the main TMDL report. QUAL2Kw modeling for the Deschutes River mainstem TMDLs, described in Appendix E, analyzed the linkage between DO levels under critical conditions and nutrient concentrations instream. Section 5.4 of Appendix E describes model sensitivity analyses that evaluated the relationship between nutrient stressors and DO response in the river. The relationship between nutrients and DO identified through the QUAL2Kw modeling analyses was applied in the development of the tributary TMDLs.

A margin of safety was determined for the tributary DO and pH TMDLs. As described in Section 7.4.2 of the TMDL document, conservative assumptions served as an implicit margin of safety for the DO and pH TMDLs. First, the effective shade and heat load targets were evaluated under zero cloud cover and critical summer conditions. Second, shade and nutrient targets were applied collectively and were based on reference conditions.

Section 8 of EPA's 2020 TMDL document describes reasonable assurance for the TMDLs. Implementation is ultimately the responsibility of the State and will be based on Ecology's Implementation Plan.

b. In regard to protection of downstream waters, refer to the responses to DERT's comment 2 and NWEA's comments 45 and 46.

Comment ID DERT 42

Comment Category *TMDL implementation*

Comment Text

Appendix F, P. 23, Section 3.4

a. TMDLs should not be established for these creeks without a more rigorous analysis that quantitatively links nutrient levels to DO and the trophic status of the creeks.
b. At best, these targets should be left as targets to drive implementation of BMPs. Future monitoring should determine if nutrient reductions are resulting in DO improvements.

Response Text

a. These comments refer to the technical analyses for nutrient TMDLs for Adams Creek, Ayer Creek, Black Lake Ditch, Lake Lawrence Creek, Percival Creek, and Reichel Creek as described in Appendix F. These waterbodies are listed as impaired for DO on Washington's 303(d) list and were among the waterbody-impairment combinations disapproved by EPA in its review of Ecology's 2015 TMDLs. As a result, EPA is required to establish TMDLs for these waterbody segments.

In order to attain the applicable criteria for DO, EPA established nutrient TMDLs in conjunction with the temperature TMDLs. Specifically, the TN and TP targets are surrogate measures to address the DO impairment. The rationale for developing the TMDLs in this way is summarized in Section 3.1.3 of Appendix F: "excess nutrients facilitate the growth of benthic and planktonic algae and submerged plants, which consume oxygen through

respiration, lowering DO in the water column, and algal activities impact instream pH responses…. nutrients were identified by Ecology in the 2015 Deschutes TMDLs as the primary cause of the DO and pH water quality concerns in the tributaries (in conjunction with elevated thermal loading). Thus, EPA selected phosphorus and nitrogen as surrogates for DO and pH in the tributaries." See Section 3.2 in Appendix F for further discussion and specific justifications as to why the technical approach applied is reasonable for establishing the TMDLs addressing DO impairment for the tributaries.

b. The intent of the TMDLs is to achieve the DO water quality standards. EPA has determined that the nutrient TMDLs, in conjunction with the temperature TMDLs, are required to attain the applicable DO water quality standards. EPA does anticipate that these nutrient targets will be used to drive implementation of BMPs. The Implementation Plan in Ecology's 2015 TMDLs includes TMDL effectiveness monitoring throughout the watershed to evaluate if BMPs are working; it is up to Ecology to determine the metrics it will use to evaluate progress towards and attainment of TMDLs.

Comment ID DERT 43

Comment Category *Loading capacity*

Comment Text

Appendix F, P. 25, Section 3.5:

a. No analysis is provided to show that flow-varied loads are protective of DO.
b. The use of a relative drainage area to estimate creek flows is the weakest method available. The watershed areas used are not described, which is particularly worrisome for Percival Creek and Black Ditch, whose source watershed surrounding Black Lake is shown as excluded from analysis. Flows in these creeks may be affected by local rainfall amounts, impervious surface, ground water interactions, soil types, terrain aspect and slope.

Response Text

a. Refer to the response to DERT comment 5 that discusses the flow-variable TMDL approach.
b. The nutrient TMDLs are expressed as flow-varied loads based on TN and TP concentration targets. Thus, these do not depend on the estimated historic creek flows, but rather actual future flows. In addition, as noted on page 25 of Appendix F, long-term flow gaging records were available for Black Lake Ditch and these were applied directly in the assessment of estimating historic flows; these records include flow contributions from Black Lake. For Percival Creek, flows originating from the Black Lake Ditch drainage area were based on gage records and combined with flows estimated for the remainder of the drainage area using the USGS gage scaling methodology.

   Table 2 in Appendix F lists the data source used to develop the watershed areas, the high-resolution National Hydrography Dataset (NHDPlus V2).

Commenter Andrew Kolosseus, Washington Department of Ecology

Comment ID Ecology 1

Comment Category *Downstream water quality protection*

Comment Text

Capitol Lake determination. EPA states that the determination of the applicable aquatic life designated use for Capitol Lake is necessary to ensure that the TMDL is protective of downstream waters (Appendix B). EPA determined that Capitol Lake does not meet the lake definition as described in WAC 173-201A-020. EPA arrived at this conclusion after recalculating the lakes dentition time as 13.98 days based on the definition provided in the WAC: "Mean detention time" means the time obtained by dividing a reservoir's mean annual minimum total storage by the thirty-day ten-year low-flow from the reservoir. EPA used the same volume for the lake as Ecology did in the 2004 calculation presented in Roberts et al. 2004 https://fortress.wa.gov/ecy/publications/SummaryPages/0403103.html. EPA indicates that they updated the 30Q10 flow to span from 1946 – 2019, while Ecology only used data from 1991-2001. Ecology supports the addition of more recent flow data in calculating the lakes detention time, but questions the use of historical data that may not represent current flows. Additionally, Ecology encourages that a thorough examination of the lake's detention include an updated estimate of the lake's volume.

Response Text

EPA agrees with this comment and has updated the detention analysis and Appendix B. For further discussion, see responses to NWEA's comments 41, 42, and 43.

Comment ID Ecology 2

Comment Category *Load allocations*

Comment Text

Disconnect between Carbonaceous Biochemical Oxygen Demand (CBOD) in model scenario and allocations. In Appendix E, Tables 19 through 21 indicate that CBOD fast and CBOD slow were set to 0.49 mg/L in the natural conditions model run. Additionally, Table 23 indicates that the DO TMDL scenario model run sets nitrogen, phosphorous, and CBOD to natural conditions. However, allocations are not provided in the TMDL for CBOD (see Tables 31 and 32 in the TMDL). CBOD allocations are also not provided for aquaculture facilities (hatcheries). If controlling CBOD is needed to attain water quality standards, they should be included in the allocations.

Response Text

Based on the analyses conducted as part of these TMDLs, reducing CBOD is not required at this time to attain water quality standards. Instream CBOD concentrations are reasonably low based on available observations in the watershed of BOD5. Targets were developed for nutrients.

Given the inherent stoichiometric relationship between carbon, nitrogen, and phosphorus, nutrient reductions are expected to simultaneously correspond with reductions in CBOD.

Comment ID Ecology 3

Comment Category *Natural conditions*

Comment Text

Reference condition applied seems low. EPA set natural conditions at the Deschutes River headwaters to 55 µg/L TN and 5 µg/L NO3, based on a Cascades Ecoregion Study (USEPA, 2000). These values seem low for the Puget Sound Lowlands. The natural groundwater concentration is set at 330 µg/L NO3 for the first eight kilometers, slightly below the range for groundwater sources reported in the 1998 USGS study that was used as the basis. Finally the tributaries are set at 260 µg/L five kilometers downstream of the headwaters, also outside of the lower range reported in the same study. These values are shown in Appendix E, Tables 19, 20, and 21. What is the basis for using lower values for the reference condition than those that have been reported in the literature? In the 2015 TMDL, Ecology followed EPA guidance when setting natural conditions. On page 43 of Appendix E, EPA notes: In their model scenario, Ecology applied the 10th percentile concentration from available (2003-2004) monitoring records as the natural condition for each nutrient species and BOD. However, these data were collected under the influence of human activities (e.g., historic logging, agricultural crop cultivation, urban development). It is likely that even the 10th percentile concentrations may be elevated compared to natural conditions. Therefore, for this TMDL, available literature-based information for characterizing natural conditions in the watershed was applied by source type (e.g., groundwater) and Level III ecoregion, as shown in Table 19, Table 20, and Table 21. However, the process Ecology used in determining natural conditions is outlined in EPA guidance. See reference: EPA. 2000. Nutrient Criteria Technical Guidance Manual: Rivers and Streams. EPA-822-B-00- 002. U.S. Environmental Protection Agency, Office of Water, Washington, D.C. https://www.epa.gov/nutrient-policy-data/criteria-development-guidance-rivers-and-streams.

Response Text

EPA based its approximation of natural nutrient conditions on the Cascades ecoregion because the headwaters are in the Cascades ecoregion, not the Puget Sound Lowlands. Section 2.3.1 contains Figure 5 showing the ecoregional boundaries and discusses which waterbodies were assigned input values based on the Cascades Ecoregion and the Puget Lowland Ecoregion.

EPA disagrees that reference condition values lower than the literature were used. For example, the median groundwater nitrate concentration from the 1998 USGS study was applied directly (0.33 mg/L); see Table 5 in the 1998 USGS report. The comment also references the nitrate concentration applied within the QUAL2Kw model for the tributaries relative to the USGS study. EPA does not find this comparison relevant because the USGS study was of hydrology and quality of groundwater, not surface water, in Northern Thurston County, Washington. EPA supports the use of the cited Nutrient Criteria Technical Guidance Manual, but for the reasons

noted in this response and within Section 5.3.2 of Appendix E, EPA determined that applying the ecoregional nutrient criteria recommendations was one of the conservative assumptions that it wanted to incorporate into the QUAL2Kw model as part of the implicit margin of safety.

Comment ID Ecology 4

Comment Category *Natural conditions*

Comment Text

EPA does not assess whether revised natural conditions can be met. The Deschutes River traverses through various land use categories including agricultural and urbanized landscapes. Ecology acknowledges that meeting natural conditions in the watershed will be challenging. This is made more challenging if the natural conditions are low. The revised natural conditions provided by EPA are lower than those previously established by Ecology in the 2015 TMDL.

Response Text

As discussed in EPA's response to WDOE comment 3, the natural nutrient conditions were approximated based on EPA's ecoregional criteria recommendations. Therefore, EPA considers the nutrient concentrations to be a reasonable approximation of natural conditions. However, the adaptive management process described within the Implementation Plan allows for refinement of water quality targets as new information is available, which may include future refinement of the way natural conditions were characterized within EPA's 2020 TMDL document.

Comment ID Ecology 5

Comment Category *Data for TMDL development*

Comment Text

Green-Duwamish data use for E. coli criteria. EPA used paired E. coli-fecal data from the Green-Duwamish Watershed (WRIA 9) to create translated E. coli criteria. Ecology recommends that data for such translations be collected within the Deschutes Watershed.

Response Text

During the development of the bacteria TMDLs, EPA discussed the paired *E. coli*-fecal coliform data collected in the Deschutes River watershed for the development of the translator with Ecology. In May 2019 Ecology recommended that the WRIA 13 paired *E. coli*-fecal coliform data not be used for this purpose due to quality concerns. EPA agrees a translator from within the watershed is ideal, but collecting additional data was outside the scope of these TMDLs. Ecology recommended that the data from outside of WRIA 13 be used for this purpose. EPA selected the Green-Duwamish River watershed due to its proximity, ecoregion classification, and paired data availability. The translator was applied to evaluate existing loads. As of January 1, 2021, *E. coli* is to be used as the indicator for waterbodies where freshwater primary contact recreation is the applicable designated use, so a translator may not be necessary in the future. Targets defined for

the bacteria TMDLs are in terms of the most stringent applicable water quality criterion. Data collected by Ecology and other partners to evaluate TMDL implementation progress could include paired *E. coli* and fecal coliform samples to support adaptive management efforts.

Comment ID Ecology 6

Comment Category *Wasteload allocations*

Comment Text

Stormwater allocations of zero. EPA assigns some stormwater wasteload allocations of zero. These allocations are in conflict with Ecology permit conditions which allow year round non-stormwater discharges such as intercepted groundwater and potable water on occasion. A zero wasteload allocation is interpreted by Ecology as a zero discharge, because no amount of sample data can average or achieve a zero concentration. Ecology does not believe zero discharge is the intent by EPA in this TMDL, rather a near-zero pollutant load where the flow of water is still allowed, but the concentration of the pollutant is low or insignificant. It is clear to Ecology that EPA recognizes there are 'limited exceptions' in which several of Ecology's general stormwater permits allow non-stormwater discharges year round under certain conditions when that discharge is considered negligible due to either infrequent occurrence or there is not a pollutant concern. In this TMDL EPA should strike zeros from the wasteload allocation tables (e.g. the "non-storm" columns of Table 26, 44 and 45) for permittees because they are in conflict with Ecology's existing permit conditions which allow for non-stormwater discharges under certain circumstances such as intercepted groundwater and potable water on occasion. Alternatively, EPA could replace the numerical zero with a narrative term such as 'negligible' in the non-storm column for the permittees but would also need to state the meaning as infrequent, not a source of concern, or no need to verify.

Response Text

Ecology is correct in that it is not the intent of the wasteload allocations during non-stormwater periods to prohibit allowable discharges, but instead EPA's intent was to convey that if permit conditions are followed, loading during non-stormwater periods is expected to be negligible. While EPA did intend to allow for Ecology's discretion in implementing these wasteload allocations into the associated general permits, it does not want to cause confusion in establishing permit conditions. Therefore, EPA has clarified the intent of the wasteload allocations for the stormwater general permits as footnotes to the TMDL tables and within the associated narrative.

Comment ID Ecology 7

Comment Category *Wasteload allocations*

Comment Text

Sand and Gravel General Permit. The Sand and Gravel General Permit allows for process water and mine dewatering water discharges in addition to stormwater. Most places in the TMDL that the Sand and Gravel General Permit is mentioned, is referred to as a permit that allows for stormwater discharges and doesn't acknowledge the other types of discharges. The TMDL should reflect the three types of discharges allowed for under the Sand and Gravel General Permit. The TMDL lists three Sand and Gravel permittees on the main stem Deschutes downstream of Offutt Lake. These three permittees are given an aggregate allocation in Table 33 of the TMDL which is noted as "Sand and Gravel Stormwater." The language should be changed to note that the WLA assigned to the permittees covered by the Sand and Gravel General Permit is for any allowed discharge covered under the permit, even though nutrient loads from these sources are anticipated to be de minimus. Ecology recommends removing the word "stormwater" from Sand and Gravel wasteload allocations. A zero wasteload allocation for non-stormwater discharges in the in Tables 44 and 45 indicates a WLA of zero for process water and mine dewatering water discharges for permittees covered under the Sand and Gravel General Permit. Ecology interprets a zero wasteload allocation as zero discharge. Even if a source is not considered a source of nutrient loading, loading of zero is impossible to meet.

Response Text

EPA recognizes that the Sand and Gravel General Permit allows for non-stormwater discharges, but in evaluating existing permittees for the development of EPA's 2020 TMDLs, did not find any that are authorized to discharge non-stormwater discharges. However, EPA acknowledges that the discussion of this is inconsistent, and EPA also did not intend to imply non-stormwater discharges are not allowed. The requested revision to references to the Sand and Gravel General Permit have been made in the TMDL document. The intent of the wasteload allocations was clarified in the same manner as noted in EPA's response to Ecology comment 6.

Commenter Lisa Dennis-Perez, LOTT Clean Water Alliance

Comment ID LOTT 1

Comment Category *Reserve capacity*

Comment Text

The LOTT Clean Water Alliance asks EPA to consider additional TMDL reserve allocations within the Deschutes River basin and the Ayer Creek basin for future reclaimed water projects that could improve water quantity and quality issues within these basins.

LOTT's long-term wastewater resource management plan depends upon future use of reclaimed water to replenish groundwater. LOTT currently operates the Hawks Prairie Reclaimed Water

Ponds and Recharge Basins in Lacey where reclaimed water infiltrates through basins to replenish groundwater. LOTT owns other properties in the Deschutes River basin where the utility tentatively plans to develop similar groundwater recharge facilities in the future. However, the exact location and design of future reclaimed water projects in the basin is not yet known. While LOTT owns several properties that might be used for this purpose, infiltration capacity at these sites is not as promising as once thought, and alternative sites are under consideration. This type of groundwater recharge project does not typically fall under requirements for an NPDES permit and TMDLs, however, LOTT wanted EPA to be aware of our plans for these types of facilities within the basin. LOTT asks that EPA consider these potential future projects to ensure that the Deschutes River TMDLs do not in any way preclude/prohibit future development of these facilities.

LOTT is also exploring the feasibility of a wetland/streamflow augmentation project using Class A Reclaimed Water in the Ayer Creek/Deschutes River basins. The concept involves augmenting the Schneider's Prairie wetland complex with Class A Reclaimed Water in dry summer months. The water would travel through the wetland complex and groundwater system before surfacing to Ayer Creek and/or the Deschutes River, both of which are impacted by low flow conditions. This project could have significant benefits to water quantity and the potential to also improve water quality in reaches of the Deschutes River and Ayer Creek where critical low flows contribute to water quality impairments. A large portion of the wetland complex was apparently used historically as farm and pasture land, and Ayer Creek was channelized. The project could be designed to improve degraded areas of the wetland complex and Ayer Creek, restoring functional values and improving riparian conditions. This project had not yet been identified at the time that the original Deschutes River TMDLs were developed, and therefore has not yet been accounted for in allocations.

LOTT asks that EPA consider reserve allocations for this potential project as part of the final Ayer Creek and Deschutes River TMDLs. Class A Reclaimed Water is high quality water, but it contains nitrogen and phosphorus. It also tends to be warmer than ambient streamflows. A reserve allocation for these parameters would allow for further exploration and development of a wetland/streamflow augmentation project in the Ayer Creek/Deschutes River basins. LOTT is at the earliest stages of assessing project feasibility, and much is not yet known about if and how nitrogen, phosphorus, and temperature from reclaimed water might affect water quality. Temperature, nitrogen, and/or phosphorus loads may be attenuated through soil aquifer treatment, riverbank infiltration, or other means before the reclaimed water would reach wetlands, Ayer Creek, or the Deschutes River. Data from our Hawks Prairie site indicates that nitrogen levels are significantly reduced as the water moves through a series of wetland ponds prior to infiltration. It is also possible that any detrimental effects from these loads would be offset by dilution that would result from increased in-stream flows. Ultimately, the reserve allocations may not be necessary or utilized.

However, we ask that they be established such that the door is not closed to this potentially beneficial future project.

Groundwater recharge and wetland/streamflow augmentation projects with reclaimed water can

contribute to better integrated water resource management. These projects offer multiple benefits:

- Address wastewater capacity needs for growing local communities
- Minimize nutrient inputs from wastewater discharge into Budd Inlet/Puget Sound marine waters
- Replenish groundwater that feeds low flow reaches of the Deschutes River
- Mitigate impacts of municipal and permit-exempt water withdrawals
- Make wise use of water resources

LOTT is an active participant in watershed planning efforts. Community partners also involved in water resource planning efforts have expressed interest in seeing the benefits above realized. As one example, LOTT and the Squaxin Island Tribe are working together under a Memorandum of Understanding to identify habitat improvement and water quality improvement projects in the watershed, and there is shared interest in introducing reclaimed water in the mid or upper Deschutes River basin to improve streamflow and habitat conditions.

LOTT respectfully asks that EPA consider these projects in the context of TMDLs for the Deschutes River and Ayer Creek; allow for development of future reclaimed water groundwater recharge facilities; and provide reserve allocations re: nitrogen, phosphorus, and temperature for a potential future wetland/streamflow augmentation project. We are happy to follow up with data on typical temperature, nitrogen, and phosphorus levels found in our reclaimed water, and to discuss the reclaimed water project concepts further if that would be helpful.

Response Text

EPA appreciates LOTT sharing this information regarding potential future reclaimed water projects in the Deschutes watershed and that LOTT is exploring the feasibility of such innovative wastewater treatment solutions. Based on the likelihood of discharges to groundwater, which are unlikely to require a NPDES permit, and on the unknowns about future streamflow/wetland augmentation projects, EPA decided not to create a reserve allocation for these projects. However, EPA recognizes that such projects may be one of the approaches needed to meet the Deschutes TMDLs, or even a downstream TMDL for Budd Inlet. EPA does not intend for the TMDLs to preclude the potential for future water reclamation projects in the watershed.

No reserve allocation has been established because it is unlikely that an allocation would be needed for reclaimed water projects that discharge to groundwater. Ecology has the authority to determine the types of permits required for the streamflow/wetland projects described in comments. If Ecology determines that streamflow augmentation or other future reclamation projects require an NPDES permit, they would be consistent with the flow-based nature of the nutrient TMDLs in this document if the concentration of the augmented flows is consistent with the TMDL targets. For temperature, effective shade would likely not be applicable to a flow augmentation project, but if Ecology determined a NPDES permit was necessary, permit conditions resulting in compliance with water quality standards would be consistent with EPA's

2020 TMDLs. As Ecology is responsible for implementing the TMDLs, EPA recommends that LOTT follow up with Ecology to discuss reclamation project details.

Commenter Erica Marbet, Squaxin Island Tribe

Comment ID SIT 1

Comment Category *Outside scope of the CWA / TMDL program*

Comment Text

It is frustrating that, for many of the Tribe's requests and questions around the TMDL, EPA's response is either limited by regulatory blinders, or driven by statutory necessity without additional value to the process.

Regulatory Blinders- EPA claims the Clean Water Act does not regulate flow.

Regarding river flow: At the request of the Squaxin Island Tribe, the Northwest Indian Fisheries Commission's statisticians recently analyzed the long record of the Deschutes River at Rainier, WA for trends in discharge. They concluded that, for a given quantity of rainfall, the late summer flow response of the Deschutes River has declined by about 10 cfs in 66 years.1 This is significant, because the Deschutes River median daily discharge is about 35 cfs in late summer. We will continue to pursue flow-related solutions to the Deschutes low dissolved oxygen and high temperature problems.

1. Analysis of discharge data for the Deschutes River (1950-2016) and an assessment of long-term trends. A report for the Squaxin Island Tribe, By Robert Conrad and Oliver Miler, Northwest Indian Fisheries Commission, September 14, 2020, DRAFT IN REVIEW

Response Text

TMDLs are developed for pollutants that cause impairments. River flow rate and volume may affect a waterbody's assimilative capacity for a pollutant. As a result, river flow rate and volume are among the many factors considered in determining a TMDL's pollutant cap and allocations. During tribal consultation on EPA's 2020 TMDLs, EPA and the Squaxin Island Tribe discussed the Tribe's concerns about flow. EPA discussed the manner in which analysis of a waterbody's flow volume or rate is relevant in the TMDL context.

EPA acknowledges that alterations in a waterbody's flow regime can contribute to a pollutant's ability to cause an impairment and that increased flows in the Deschutes River also increase the assimilative capacity. This concept is reflected in the flow-variable expression of the Deschutes River nutrient TMDLs, which increase as flows increase. Additionally, as clarified in Section 6.2 of the revised final TMDL, EPA used Scenario 5 from Ecology's 2015 TMDLs as the temperature baseline scenario for TMDLs addressing DO impairment, and that scenario includes an increase in baseflows. Management strategies that provide a co-benefit of increasing baseflow (e.g., practices that treat nutrients, promote groundwater recharge, and increase baseflow) may

aid in implementation of EPA's 2020 TMDLs. Because development of the Implementation Plan is the responsibility of the State, EPA recommends that the Squaxin Island Tribe presents its flow-based implementation suggestions to Ecology.

Comment ID SIT 2

Comment Category *303(d) Listings (including waterbodies not covered by TMDL)*

Comment Text

Regulatory Blinders- EPA says they cannot set TMDL's for Thurston, Johnson, and Mitchell Creeks, because they were not originally part of Ecology's list.

Response Text

As noted in EPA's response to NWEA's comments 3 and 44, EPA's scope in the 2020 TMDLs is limited to the 2015 TMDLs it disapproved.

Comment ID SIT 3

Comment Category *Load allocations*

Comment Text

Statutory Necessity without added value- Set load allocations for parameters for which Ecology established percent reduction in fine sediment and bacteria.

Response Text

See EPA's responses to DERT's comments 7 regarding the value added by EPA's changes.

Comment ID SIT 4

Comment Category *Downstream water quality protection*

Comment Text

Regarding the Capitol Lake and Budd Inlet TMDL, and State of Washington's Environmental Impact Statement (EIS) on Capitol Lake: There is no guarantee that this analysis will compel Ecology to take any actions. The long history of problem assessments for Capital Lake suggests that inaction is more likely than not. Yet neither Ecology nor EPA have stepped up to compel some action. Instead it is wait, wait, wait... …while water quality standards are not being met, in violation of the law. Likewise, for Budd Inlet, when Ecology separated the Budd Inlet from the Deschutes River TMDL, they promised action would be forthcoming. It has now been years, and Ecology has not demonstrated any progress. Our information suggests that Ecology is putting the Budd TMDL on hold in favor of other, unproven alternative approaches. Again, it is all about delay when there are clearly violations of the law.

Response Text

The Clean Water Act requires States to develop TMDLs for waters on their 303(d) list according to their priority ranking. It is EPA's understanding that the Capitol Lake TMDL is not currently identified as a high priority for development because of the ongoing EIS process cited in your comment. Ecology has informed EPA that the Budd Inlet TMDL is in progress and this is described on Ecology's website.

Comment ID SIT 5

Comment Category *Reserve capacity*

Comment Text

Thank you for looking into the limitations around location of the Pioneer Park hatchery as it relates to wasteload allocations for Nitrogen and Phosphorus.

Response Text

EPA appreciates the Squaxin Island Tribe bringing the potential locations of the new hatchery to its attention.

Commenter Eric Christensen, City of Olympia

Comment ID Olympia 1

Comment Category *TMDL Miscellaneous*

Comment Text

The City of Olympia appreciates the opportunity to comment on the Total Maximum Daily Loads (TMDLs) for the Deschutes River and its Tributaries. It has been a long process getting to this point, and we look forward to using the TMDL as a water quality protection and clean up tool. The City agrees with many of the findings and looks forward to implementing actions to meet the water quality goals for our local surface water bodies. We strive to ensure our local waterways are clean and healthy. This water cleanup plan will help us to identify further actions in our watershed to help curb pollutant loads and enhance water quality.

Response Text

EPA appreciated the comments from City of Olympia and the efforts being implemented by the City to protect and restore water quality in the watershed.

Comment ID Olympia 2

Comment Category *Data for TMDL development*

Comment Text

We have concerns regarding public safety and efficacy of TMDL implementation. This study appears to be based on data from 2003-04. We have eliminated several sanitary sewer cross connections in the Moxlie Creek and Schneider Creek basins and constructed several regional treatment facilities to provide water quality treatment over the last 15+ years.

Response Text

The TMDLs were based primarily on data from 2003-2004, as these were the best and most recent data available. Efforts by the City of Olympia over the last 15 years, such as the cited elimination of sanitary sewer cross connections and construction of regional treatment facilities, have likely reduced indicator bacteria concentrations and loads, but data are not yet available to demonstrate this progress. If such improvements have indeed occurred, the City of Olympia may have already achieved some of the reductions required in the TMDLs for indicator bacteria. As Ecology is responsible for TMDL implementation, EPA recommends Olympia contact Ecology to discuss its efforts to eliminate sewer cross connections and construct regional treatment facilities and how those will factor into TMDL implementation.

Comment ID Olympia 3

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

The City requests a more thorough investigation and a use attainability analysis regarding establishing Budd Inlet/South Puget Sound as a marine shellfish harvesting designated use. The boundary selected at the confluence of Mission Creek to Budd Inlet north along Priest Point Park raises a public health concern. The State Department of Health (DOH) has prohibited shellfish harvesting from these waters for decades, due to multiple factors including proximity to a sewer treatment outfall, marina/boating use, and legacy pollutants. If the designation or boundary is unable to be shifted to match the mandatory closure area from the LOTT Clean Water Alliance's Budd Inlet Treatment Plant outfall, at the very least, we propose an acknowledgement within the document that clearly and plainly explains the difference between EPA's designated use and DOH's prohibition of marine shellfish harvesting. We believe a distinct line must be drawn so that the public using the marine waters are not confused into believing shellfish harvesting can take place along these shorelines.

Response Text

Refer to EPA's response to Washington State Department of Health's comment 1 regarding designated uses, and EPA's response to the City of Tumwater comment 10 regarding the use attainability analysis process and EPA's role in it. Although Washington's designated shellfish harvest use for marine water quality standards is different from the shellfish harvesting status

issued by the DOH, EPA does not want to cause confusion about the status of shellfish harvesting in Budd Inlet and has added clarification to the Designated Use discussion in Section 3.1 and a footnote to Table 2.

Comment ID Olympia 4

Comment Category *Data for TMDL development*

Comment Text

Also, we assume that the change to E. coli as a metric for the bacterial criteria in tributaries is to ensure consistency with Washington State Department of Health shellfish safety criteria. Given the concern above and in order to be consistent with Washington State Department of Ecology water quality standards and other local TMDLs, we request that the Fecal Coliform indicator for bacteria be used consistently for all freshwater streams in Olympia. This will allow for an "apple-to-apple" comparison and consistency in monitoring data from stream to stream and reduce possible confusion during sampling and data analysis.

Response Text

The Washington water quality standards for bacteria differ for primary contact recreation and shellfish harvesting. The indicator bacteria for freshwater primary contact is *E. coli* whereas the indicator bacteria for shellfish harvesting is fecal coliform (Table 3 in EPA's 2020 TMDLs). As discussed in Section 5 of Appendix D, the bacteria TMDLs are expressed in terms of the bacteria indicator for the most stringent applicable water quality target to the waterbody or downstream waters. The comparisons of the criteria used to determine the most stringent target are discussed in Appendix D. Should the City be interested in an alternative expression, the regression equation applied to translate between the indicators is provided in Section 3.1 of Appendix D.

Comment ID Olympia 5

Comment Category *Water quality attainment*

Comment Text

Also, the City is concerned with the proposed Dissolved Oxygen (DO) load allocations for Lake Lawrence Creek and Black Lake Ditch (Listing ID's 47696 and 47761, respectively). The City is part owner of the property surrounding Lake Lawrence Creek in partnership with the cities of Lacey and Yelm. Both waterbodies were created by constructing channels through historic wetlands, to provide drainage for farming or to potentially stabilize water levels in the Black Lake and Lake Lawrence. Much of the length of both creeks is very low gradient with minimal riffles and fed by springs and surrounding wetlands. It is highly unlikely these channels will ever be put back into their pre-manipulated condition.

In the summer and fall, the source of water to Lake Lawrence Creek is springs discharging low DO groundwater into a historically constructed ditch/channel dug to drain agricultural lands. There is no riffle activity within the channel to provide oxygenation. Natural conditions in this

type of water body likely preclude meeting the proposed criteria (see photo below). The City of Olympia is in the last phase of implementing a mitigation project that entailed disabling drainage to restore wetlands, increasing storage and summer baseflows to the Deschutes River, and restoring native forest in the riparian area around Lake Lawrence Creek. The historic use of the surrounding fields as sheep pasture ended in 2015. This has reduced nutrient loading in this water body. Water quality measurements were conducted with a handheld water quality meter (YSI brand) in Lake Lawrence Creek in 2020 (see map and table below). This data indicates low to very low DO levels and in combination with the 3 samples from 2003 it appears that this creek will never meet a 9.5 mg/l standard.

In Black Lake ditch, the water flows from Black Lake and through a large wetland complex. Any water quality conditions occurring within the lake have a large effect on water quality within the ditch. It may be that more flow is directed to Black Lake Ditch than the Black River. Any planting or actions taken within and/or adjacent to the ditch could still prove inadequate to attain the allocated dissolved oxygen (DO) levels in the TMDL. Natural conditions in the lake and wetlands may preclude meeting proposed DO and pH criteria. We are concerned that any actions that can be implemented will not affect the parameters enough to attain the proposed criteria.

Response Text

EPA recognizes the City of Olympia's concerns regarding the ability of Black Lake Ditch and Lake Lawrence Creek to attain the criteria specified in the Washington water quality standards. EPA recommends that the City of Olympia discuss these concerns relative to TMDL implementation with Ecology. Together the City, Ecology, and other stakeholders in the watershed can collaborate in the prioritization of projects, guide collection of additional data, and collectively consider potential Use Attainability Analysis studies for these waters.

In regard to mitigation projects previously implemented or under development within the context of the TMDLs and meeting the targets and allocations of the revised TMDLs, see the response to the City of Olympia's comment 7.

Comment ID Olympia 6

Comment Category *Mainstem tributaries*

Comment Text

Also, we question if Black Lake should be included in this TMDL as recent aerial photos indicate that the outlet to the Black River is not maintained and runs through many acres of a large wetland and beaver dam complex.

Response Text

As described in EPA's response to NWEA comment 3, EPA's 2020 TMDLs only address the 2015 TMDLs submitted by Ecology that were disapproved on June 29, 2018. A TMDL for Black Lake was not included in Ecology's submittal.

Comment ID Olympia 7

Comment Category *TMDL implementation*

Comment Text

The City also questions the wasteload allocation proposed for the removal of Total Nitrogen (TN) - 69% and Total Phosphorus (TP) - 82% in Black Lake Ditch and Percival Creek (Listing ID 48085). In 2018, the City completed an analysis of basin characteristics (Storm and Surface Water Plan, 2018). The basin flowing to Black Lake Ditch and Percival Creek is known as the Percival Creek Basin. Stormwater runoff from 476 acres of a total 770 acres of impervious surface area in the basin is currently being treated. This equates to a total treatment of 61.8% of the stormwater discharging into Black Lake Ditch and Percival Creek. It is unclear how the City will reduce 69% of TN and 82% of TP for the wasteload allocation when only 38.2% of untreated impervious area remains.

Response Text

As discussed under reasonable assurance in Section 8 of EPA's 2020 Deschutes TMDLs, the Implementation Plan is the responsibility of the State, which includes how TMDL wasteload allocations are incorporated into Olympia's MS4 permit. Best management practices such as the treatment referenced in the comment may be eligible for being credited towards TMDL implementation by the City of Olympia. While this comment discusses the impervious area currently treated in the catchments of Black Lake Ditch and Percival Creek, the treatment levels or nutrient removal efficiencies achieved with the currently implemented practices are not presented. To meet TN and TP allocations, additional measures may be needed if treatment on these lands is insufficient. In addition, treatment of pervious land, such as practices that reduce erosion and transport of particulate nutrients, may be necessary.

Comment ID Olympia 8

Comment Category *Water quality standards (including UAA & designated uses)*

Comment Text

The current state of hydrology and hydrogeology for Black Lake Ditch and Lake Lawrence Creek lead us to question whether proposed DO load allocations will ever be attainable. The presumption that these water bodies can meet DO levels being allocated seems very unlikely even with 100% shade, given the origin of water being lakes and groundwater discharge. Along some sections of both water bodies it has been challenging to establish riparian woody vegetation. This is due to environmental conditions being too wet due to hydrologic conditions, wetland restoration work and beaver activity. We have also reforested a large City-owned property along Black Lake Ditch over the years and continue to enhance riparian and aquatic habitat along this waterway. A use attainability analysis may be warranted, or a load allocation more closely aligned with an attainable use in both these waterways.

Response Text

EPA appreciates the work the City has done to enhance riparian vegetation and the aquatic habitat along these waterbodies. See further discussions regarding a potential use attainability analysis in the responses to City of Tumwater's comment 10 and City of Olympia's comment 5.

Comment ID Olympia 9

Comment Category *Wasteload allocations*

Comment Text

Our last concern is that the waste load allocations appear to be based on the percentage of the watershed areas in various jurisdictions. In section 6.4.5 page 60, the TMDL states that MS4 systems do not discharge in the dry season. We agree with this statement and have observed that many of our regional facilities do not discharge into surface waters until late fall. Our understanding is that the primary times when the Deschutes River, Budd Inlet and tributaries do not meet DO standards is during the summer and early fall. Any nutrients discharged to tributaries in the wet season will not remain in the river or tributaries for long. We are interested in how Budd Inlet circulation and flushing distribute or flush wet season nutrient loads in the months before DO criteria are not met in late summer. Using a purely watershed area scaled approach may not be appropriate for this analysis or meet the intended water quality objectives. If wasteloads are only allocated to MS4 permittees (who can only impact wet season wasteloads), this may not improve DO conditions at critical times of year. The relationship between DO deficits in the summer and nutrient inputs in the fall-spring is unclear.

Response Text

Regarding MS4 discharges during dry periods, it is expected that stormwater discharges are negligible when there is either no precipitation or there is not adequate precipitation to generate runoff (see Section 6.4.5). During wet periods, stormwater contributes biostimulatory substances to the river network. These loads influence long-term biogeochemical processes, such as the sediment oxygen demand, that impact oxygen levels during the critical season. For this reason, flow-varied nutrient TMDLs are established to address year-round sources of nutrients. Wasteload allocations are not only assigned to MS4 permittees, but also to hatcheries and facilities covered under the General Permits for Industrial Stormwater, Sand and Gravel Stormwater, and Construction Stormwater. A load allocation is assigned for non-point sources, which contribute nutrients year-round (e.g., via resurfacing groundwater). As indicated by the load allocation to nonpoint sources relative to the MS4 wasteload allocations in Table 33 of the TMDL document, most of the TN and TP loading capacities are allocated to nonpoint sources, which as the comment notes, are a much greater loading contributor during the dry season. The TMDLs vary by streamflow, which covers wet/dry and warm/cool seasonal loading to ensure DO is protected at critical times during the year.

This comment also discusses Budd Inlet circulation and flushing, which is outside the scope of these TMDLs. Ecology is in the process of developing a TMDL for Budd Inlet.