



State of Oregon Department of Environmental Quality
**Upper Klamath River and Lost River
Subbasin TMDL, Response to Public
Comment**

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Introduction

The Upper Klamath and Lost River Subbasin's TMDL was reissued on December 22, 2017. The previous parameters that were approved in the TMDL include DO, pH, Ammonia Toxicity, and Chlorophyll-*a*. Temperature has been excluded and a separate TMDL is being developed for temperature at this time. The purpose of this public comment period was to allow for public participation in regards to the changes to the TMDL made in response to after minor changes were made because of petitions for reconsideration from Langell Valley and Horsefly Irrigation Districts.

DEQ has made every effort to address each of the comments received. DEQ also recognizes substantial changes to agreements and programs referenced in the TMDL since the TMDL was issued in 2010. To this end, the intent of the current issuance was to cover items specific to reconsideration and items in the document that may be out of date, or updated information is available for, will be addressed at a later time.

Comments and Response

DEQ received the following comments during the public comment period. The comments were compiled and evaluated individually and structured as they relate to each of the commenters.

Langell Valley and Horsefly Irrigation Districts:

LV & HID #1:

Comment: The Revised TMDL correctly identifies on page 150 that under the Agricultural Water Quality Management Act ("AgWQMA"), ODA "is the DMA responsible for regulating agricultural activities that affect water quality" through Agricultural Water Quality Management Area Plans. These Area Plans are developed or modified based on DEQ's load allocation to agricultural nonpoint sources in TMDLs. The Revised TMDL also correctly identifies at page 144 that USBR is the "DMA responsible for developing a source-specific implementation plan to address load allocations associated with water delivery and drainage facilities that are federally owned and/or operated in the Klamath Reclamation Project and facilities used to supply water to the irrigation project." In Table 3-12 on page 123, ODA and USBR are each allocated 50% of the overall nonpoint source load allocation for designated management agencies discharging to the Lost River system. No other entities, sources, or sectors are listed in the allocations.

DEQ Response: The TMDL covers the entities that have authority over sectors and sources that affect water quality. The Oregon Department of Agriculture (ODA) and the Bureau of Reclamation (BOR) have been named as Designated Management Agencies (DMA's) who are responsible for developing source specific TMDL Implementation Plans. The Water Quality Management Plans facilitated by ODA are written for the individual landowners throughout the watershed and do not cover the Water Management Districts (WMDs). In addition, through transferred works all operation and maintenance on the BOR owned facilities are delegated to the WMDs. For this reason, DEQ has identified all WMD's as responsible persons in the Water Quality Management Plan with the requirement to develop Source Specific TMDL Implementation Plan and associated Best Management Practices (BMP's). In establishing a TMDL, OAR 340-042-0040(4)(I)(G) states that the department will include a WQMP that includes "Identification of persons, including Designated Management Agencies (DMAs), responsible for implementing the management strategies and developing and revising sector-specific or source-specific implementation plans." This rule provides that while a WQMP can designate DMAs it can also identify other persons with a role in implementation. Additionally OAR 340-042-0080(4) states that persons identified in the WQMP must prepare an implementation plan. The Environmental Quality Commission adopted these rules under the authority granted to it to take acts necessary to implement the Federal Clean Water Act under ORS 468B.035. Additionally, ORS 468B.110 grants DEQ authority to establish and enforce TMDLs by rule or order. This TMDL was issued by DEQ as an order.

LV & HID #2:

Comment: The term "designated management agency" is defined by rule at OAR 340-042-0030(2) as "a federal, state or local governmental agency that has legal authority over a sector or source contributing pollutants, and is identified as such by the Department of Environmental Quality in a TMDL." However, the Revised TMDL cites to this rule in support of its statement on page 140 that "DMAs *and Responsible Persons* are recognized by the State of Oregon as being those entities with the legal authority to ensure that the targets set forth in the TMDL are met (OAR 340-042-0030 (2))." Nowhere in the cited rule definition is the term "responsible persons" used, and nowhere in the revised TMDL does DEQ explain the difference in the terms. This distinction matters, since the Revised TMDL seeks to require the Districts to develop TMDL Implementation Plans based on their purported status as "responsible persons" with purported legal authority to ensure TMDL targets are met. ODA has been tasked by the AgWQMA with implementation of TMDLs for agriculture, and ODA has authority to enact rules to ensure agricultural actions comply with Area Plans in support of TMDLs. Irrigation districts have not been delegated such authority by the Legislature. As such, it is improper for the Revised TMDL to attempt to create such authority by labeling the Districts so-called "responsible persons."

DEQ Response: Please see response to LV & HID #1

LV & HID #3:

Comment: The Revised TMDL states on page 13 without citing to authority that "water management districts" are required to develop TMDL implementation plans:

Responsible Persons responsible for preparation of TMDL implementation plans include Water Management Districts and PacifiCorp. These entities must develop individual WQMPs and TMDL Implementation Plans to address load allocations identified in the TMDLs.

The term “water management district” is not defined in the Revised TMDL, nor does it appear in the TMDL rules. Instead, the Revised TMDL simply lists the term as a heading on page 25, provides a short discussion of how most of the water in USBR’s Klamath Reclamation Project is delivered by irrigation and drainage districts, and then includes a map graphic at Figure 1-13 purporting to show the location of such “water management districts” in the Klamath Reclamation Project. Both LVID and HID are shown on the map. However, the Revised TMDL fails to state a legal basis for including the Districts as entities with legal authority to ensure compliance with TMDL targets. Neither is listed in the document as a Designated Management Agency, neither appears in the overall load allocation table for Lost River nonpoint sources, and neither has authority to require changes in land management practices after water is delivered to district patrons to achieve TMDL targets, whereas ODA checks all three of these boxes by virtue of the AgWQMA. Furthermore, LVID’s conveyance system is owned by USBR, such that it would also fall within the scope of USBR’s designation on page 144 as the “DMA responsible for developing a source-specific implementation plan to address load allocations associated with water delivery or drainage facilities that are federally owned and/or operated in the Klamath Reclamation Project.” As drafted, the Revised TMDL fails to provide the Districts with the basic jurisdictional certainty needed before requiring them to develop TMDL Implementation Plans for agricultural activities occurring within their respective boundaries.

DEQ Response: Please see response to LV & HID #1.

Oregon Water Resources Commission:

OWRC Comment #1: The Revised Upper Klamath and Lost River Subbasins TMDL and Water Quality Management Plan (Revised TMDL) utilizes several terms that may or may not be applicable to irrigation districts and similar entities. The terms “Designated Management Agency (DMA)” and “responsible parties/person” and “Water Management District” are used throughout the document and in some instances interchangeably. We agree with the revised TMDL that irrigation districts are not DMA’s. However, it is unclear what the legal distinction and potential liabilities are as a responsible person/party. We are concerned that the lack of clarity in the role of districts, combined with a lack of resources and legal authority for districts to effectively implement water quality management plans, could lead to further conflict in the Klamath Basin.

DEQ Response: Please see response to LV & HID #1

OWRC Comment #2: It is also important to note the specific responsibilities and authorities of irrigation districts and similar entities vary across the state and are often limited by the Oregon statute that the entity was formed under, such as ORS 545, ORS 547, ORS 552, ORS 553, and ORS 554. However, in all instances the primary role of these entities is the management of a quantity of water. Our members manage the conveyance of water and have limited or no control over the quality of the water that they receive or deliver. In the instance of the Klamath Project, districts receive water supplies from the Upper Klamath Lake, under a contract with the US Bureau of Reclamation, which is diverted through federal infrastructure.

DEQ Response: Please see response to LV & HID #1

OWRC Comment #3: As stated on page 130, the term DMA is defined in OAR 340-042-0030(2) as an entity “that has legal authority of a sector or source contributing pollutants,” however, we have been unable to find a definition in Oregon rule or statute for “responsible persons.” Without greater clarity, if both types of entities are required to develop source-specific implementation plans than it appears that the

terms are synonymous. DEQ may have used this term to apply to irrigation district entities as DMA's in previous TMDL efforts but we wholeheartedly disagree with such an assertion, as irrigation districts do not generally have authority or control over source contributing pollutants.

DEQ Response: Please see response to LV & HID #1

OWRC Comment #4: Irrigation districts and similar entities are supportive of collaborative, basin-wide approaches to improving water quality. Throughout Oregon, districts regularly engage with their local soil and water conservation districts (SWCDs) as well as watershed councils. They provide their water users with information and resources available from local SWCD's as well as the Natural Resources Conservation Services (NRCS). However, districts are generally not legally authorized, nor financially capable, of implementing or enforcing water quality improvement measures upon individual farmers.

DEQ Response: DEQ suggests that the irrigation districts defined as "Water Management Districts (WMDs)" in the TMDL work with their local SWCD and NRCS office to implement improvements as needed. The WMDs in the Klamath Basin have been delegated operation and maintenance through transferred works from the BOR and this delegation of authority places the burden of upkeep, maintenance, and functionality on the districts. The TMDL does not require or suggest that districts enforce water quality improvements on individual landowners. However, it does define WMDs as responsible persons for their operations and maintenance activities.

OWRC Comment #5: It is appropriate for the Oregon Department of Agriculture (ODA) to be listed as a DMA and to continue utilizing the Agricultural Water Quality Management Program (under SB 1010). ODA's program ensures that there is clarity for individual farmers and ranchers on what requirements need to be followed. Under ORS 568.930, landowners within boundaries of water quality management area plans are already required to comply with plan rules, regardless of whether they are receiving water from an irrigation district, and are subject to penalties if they do not comply. ODA has educational tools and technical assistance to provide landowners and operators to solve water quality issues. ODA also has the authority to take enforcement action against landowners and operators who do not voluntarily comply with water quality standards, implementation plans, and related area rules.

DEQ Response: DEQ and ODA have a memorandum of agreement through SB 1010 for ODA to implement Area Water Quality rules. ODA has been named as a DMA in the TMDL and as a result developed a Water Quality Management Plan. The ODA Water Quality Management Plans are specific to private landowners and do not apply to WMDs. DEQ suggests that, in addition to their own source specific TMDL Implementation Plans, the WMDs participate in the biannual Local Advisory Committee (LAC) meetings for their respective area and work with ODA to help further develop the plans for Ag water quality improvements.

OWRC Comment #6: It is also appropriate to list the US Bureau of Reclamation as a DMA related to its control and ownership of federal infrastructure in the Klamath Project. The irrigation districts in the Klamath Project receive water that is stored or conveyed through federal infrastructure and subject to federal contract requirements. It seems duplicative and inefficient to ask districts develop and implement their own plans. The individual districts in the Klamath project do not have any control on how the federal facilities that physically control the water they ultimately receive are operated in regard to water quality.

DEQ Response: Please see response to OWRC #4.

PacifiCorp:

PacifiCorp Comment #1: The DEQ did not re-issue the appendices that accompanied the Draft TMDL in 2010. PacifiCorp submitted extensive comments on these appendices including recommendations for clarifications on model limitations, discussion of model accuracy and uncertainty, validation and calibrations processes, discussion of limitations related to the use of a single model year, and a variety of other topics. Because these documents were not re-issued for review and much of the Draft TMDL itself has not changed since 2010, it is unclear if any changes have occurred to the model or the appendices. If not, PacifiCorp advises DEQ to consider the comments made in our previous comment letter (see PacifiCorp 2010).

DEQ Response: The comment period beginning August 1, 2018 and ending August 15, 2018 was the result of the granting of a petition for reconsideration of the TMDL issued on December 22, 2017. Because the subject matter of the reconsideration was limited, the window for comment was short. All comments in reference to the PacifiCorp 2010 letter were addressed in the April 3, 2017 response letter from DEQ. Changes to the TMDL in the December 22, 2017 issuance included a seasonal allocation scenario for the City of Klamath Falls and the South Suburban Sanitary District and the removal of the temperature component. There were no changes to modeling scenarios or any additional changes waste load allocations.

PacifiCorp Comment #2: Page 8, Paragraph 1, Lines 8-10. The Draft TMDL states, “ODEQ and NCRWQCB agreed to meeting downstream water quality standards or water quality objectives, as appropriate.” It is unclear what this statement means. If this statement means that the Draft TMDL’s wasteload and load allocations must or may be set at levels necessary to achieve California water quality objectives, PacifiCorp respectfully disagrees. On page 37 of the Draft TMDL there is a statement indicating that the Draft TMDL is based on Oregon standards and implies that California standards and objectives are only coincidentally achieved. The waterbodies addressed by the Draft TMDL are waterbodies in the Upper Klamath and Lost River Subbasins of Oregon. The Draft TMDL’s wasteload and load allocations must be based on the applicable water quality standards in those subbasins. The DEQ does not have the authority to establish TMDLs, including wasteload allocations and load allocations, in order for waterbodies in other states to achieve compliance with water quality standards in those subbasins.

DEQ Response: At the time of development for the TMDL DEQ and the NCWQCB along with EPA Regions 9 and 10 had a Memorandum of Agreement on TMDL Development and Implementation. As such, the two states and the EPA Regions worked together to develop a TMDL that would meet water quality standards in their respective states/regions. Furthermore, the agreement for TMDL Implementation is still in place and all entities meet on a monthly basis to confirm and discuss implementation activities.

PacifiCorp Comment #3: Page 12-13, Section 1.2.5. As noted in the text, PacifiCorp entered into the Klamath Hydroelectric Settlement Agreement (KHSA) on February 18, 2010. However, since the original draft TMDL was released in 2010, the required federal legislation authorizing the U.S. Secretary of the Interior to make a determination regarding dam removal was not passed by Congress and the Klamath Basin Restoration Agreement expired on December 31, 2015. The KHSA was subsequently amended in April 2016 to provide a potential pathway for dam removal that requires approval by the Federal Energy Regulatory Commission and not Congress. Under the amended KHSA, PacifiCorp would transfer ownership of J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate developments to a designated dam

removal entity, the Klamath River Renewal Corporation. That entity would then apply to the Federal Energy Regulatory Commission to surrender the license and remove the facilities. The relevant applications were filed in September 2016; the Federal Energy Regulatory Commission has not yet acted on these applications. The KHSA also contemplates that PacifiCorp will: (1) transfer Keno Dam to the U.S. Department of the Interior under the terms of an agreement to be negotiated between PacifiCorp and the Department of the Interior; (2) apply to the Federal Energy Regulatory Commission to decommission the East Side and West Side hydroelectric facilities just downstream of Upper Klamath Lake; and (3) continue to operate the Fall Creek hydroelectric facility in California, which diverts water from Spring Creek in Oregon. PacifiCorp recommends that DEQ update this section of the Draft TMDL to reflect the current situation.

DEQ Response: DEQ acknowledges there have been several changes and developments since the original issuance of the 2010 TMDL. However, the modification to the TMDL focused only on the items changed as a result of the petition for reconsideration and the litigation of the Natural Conditions Criteria for temperature. Future revisions of the TMDL may focus on updating the information throughout the document to reflect current agreements or arrangements. The department believes the information pertaining to the modeling and the load scenarios are still relevant despite changes to the KHSA and other agreements.

PacifiCorp Comment #4: Page 14, Paragraph 3, Lines 9-12. The Draft TMDL states “DEQ recognizes a time period from several years to several decades will be necessary after full implementation before management practices identified in a TMDL implementation plan become fully effective in reducing and controlling certain forms of pollution, especially heat loads from lack of riparian vegetation”. PacifiCorp agrees that it will likely take decades for water quality improvement measures to become fully effective. The DEQ should also recognize that the reduction of nutrients and organic matter that will be required to achieve the TMDL will likely take at least several decades—if the TMDLs are achievable at all. On page 56, the Draft TMDL indicates that the Upper Klamath Lake TMDL (DEQ 2002) calls for a substantial 40 percent reduction in phosphorus loading to meet water quality standards. The Draft TMDL points out that phosphorus concentration in Upper Klamath Lake have not shown any reduction, at least as of the data presented through 2008, despite restoration efforts (as shown in Figure 2-16 on Page 57). The Draft TMDL also recognizes that, even if this 40 percent reduction in phosphorus loading is achieved, massive algae blooms will still occur in about 2 out of 8 years.

DEQ Response: The current TMDL assumes the target in the Upper Klamath Lake Watershed of a 40% reduction in external loading of phosphorus is being met. DEQ believes the TMDL target set in the Upper Klamath Lake Watershed TMDL issued in 2002 is the target that will bring the lake back into balance.

PacifiCorp Comment #5: Page 31, Table 1-8. Regarding the table of sucker and redband trout periodicity, we suggest that more recent sources of information on periodicity be considered, including FERC (2006) and PacifiCorp (2004). For example, it seems incorrect for Table 1-8 to indicate that sucker incubation is present in February without corresponding spawning.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #6: Page 32, Paragraph 4. Given that the reassignment of rainbow trout (and therefore redband trout) from the genus *Salmo* to *Oncorhynchus* took place in 1989, this entire discussion is no longer relevant. Behnke (1992), as cited in the fifth paragraph on page 32 of the August 2018 Draft TMDL, did not split redband trout as a species, but considered them a subspecies of rainbow trout. Additionally, even more recent investigations using genetic techniques have not split redband trout from

rainbow trout as a species (see Currens et al. 2009), so the assertion in the text that they are likely a separate species is unfounded.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #7: Page 37, Paragraph 1, Line 6-7. The Draft TMDL states that “Every attempt was made to obtain the most current and comprehensive data to support water quality model development, application, and analysis” and yet there is no evidence that any of the data has been updated since the late 2000s or that the model itself was ever updated or extended beyond the 2000 and 2002 modeled years. For example, even DEQ’s own 303(d) list cited on page 41 has not been updated to the 2012 303(d) list which has been approved by the EPA and is current for Clean Water Act purposes (see <https://www.oregon.gov/deq/wq/Pages/WQ-Assessment.aspx>).

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #8: Page 38, Table 2-1, Second row. The Table identifies “...human caused temperature increases and hydraulic modification” as “pollutants” under OAR 340-042-0040(4)(b). Pollutants under the TMDL program are limited to substances or heat added to waterbodies. See OAR 340-042-0030(8); 33 U.S.C. § 1362(6). “Human caused temperature increases” are pollutants only to the extent that they are additions of heat load, and “hydraulic modification” is not itself a pollutant at all. PacifiCorp recommends that this discussion be clarified and the temperature discussion be removed from this table since a separate TMDL is being prepared to address temperature.

DEQ Response: The Department recognizes that a separate TMDL for temperature is being developed and recognizes the influence that temperature has on other parameters covered by the TMDL. Although a temperature standard has not been developed through the TMDL process, the stream segments in the Klamath Basin are listed for temperature and discussions of water quality parameters of concern include temperature influence.

PacifiCorp Comment #9: Page 40, Table 2-3. In the waters potentially influenced by PacifiCorp’s Hydroelectric Project, the salmonid spawning criteria apply only to the Klamath River between J.C. Boyle dam and the J.C. Boyle powerhouse (the bypass reach) during the period January 1 through May 15. As discussed in PacifiCorp’s (2008) 401 Application, these criteria are met in this reach. PacifiCorp recommends that DEQ clarify the presentation regarding where specific dissolved oxygen standards apply.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #10: Page 47, last paragraph and page 48, Figure 2-9. The text on page 47 asserts that dissolved oxygen levels in the river downstream of the J.C. Boyle powerhouse are below the numeric criteria from mid-February through mid-October and references Figure 2-9 as supporting information. This overall presentation is unclear and misleading. It is unclear because there are numeric and saturation criteria, both of which are presented on Figure 2-9 with no explanation of how the concentrations were adjusted to percent saturation. Concentrations should be calculated based on the 7-day mean minimum as defined in OAR 340-41-006. From about March and early April on Figure 2-9, there appear to be values that exceed the percent saturation threshold (they are presented as open diamonds) but are located below the ‘numeric criteria’ line on a mg/L basis. This discussion is misleading because the text does not fully explain how the criteria were applied to the data to make the determination that the criteria were or were

not being met. PacifiCorp recommends that DEQ present clarifying information in the text and the figure including exactly where the data came from and where the readings were taken.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #11: Page 48, Paragraph 1, Line 7. The Draft TMDL states “The following plots present data from 1995 to 2003...”. There has been considerable data collected on all of these parameters at all of these locations since 2003. While PacifiCorp understands that use of more recent data would generate a substantial amount of work and extend the timeline for completion of this TMDL, it seems to be appropriate to include the additional, more-recent data in the analysis for this Draft TMDL.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #12: Page 48, Paragraph 1, Line 8. The Draft TMDL states “If multiple measurements were collected at various depths...or on the same day, these were averaged for each site.” It is not appropriate to directly compare data when some represent individual measurements and some represent averaged values. This approach biases both the range and the variance, and is also inappropriate when constructing box plots because the purpose of box plots is to represent the whole of the distribution. For example, averaging multiple samples of dissolved oxygen across depths to create Figure 2-10 could have reduced the true variation from surface to depth especially given that the surface waters of Keno reservoir can be super saturated as a result of photosynthesis from algae while a meter or two deeper in the water column dissolved oxygen levels are a fraction of the surface values. PacifiCorp recommends that DEQ review the recent US Geological Survey reports on water quality in Keno reservoir (see Sullivan et al. 2009, 2010, 2011, 2013, and 2014) and update the discussion and analysis in the Draft TMDL as appropriate.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #13: Page 62, Paragraph 7, Lines 4-5. The Draft TMDL states “The impact of JC Boyle development is more complex because of the removal and return of water from the river”. This sentence should be expanded to be more precise since effects of J.C. Boyle operations vary by conditions (such as, time-of-year and flow conditions, among other conditions), and it is unclear as to what is meant by “more complex”.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #14: Page 63, Paragraph 1, Line 3. “Within the reservoir, average DO concentrations are depressed by 0.4 mg/L when compared to predicted conditions without a dam, under a restored loading scenario...” It is not clear what conditions are being compared here. Is it existing conditions compared to “natural” conditions plus dams, or existing conditions to “TMDL compliant” conditions plus dams, and how is water temperature factored into this comparison?

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #15: Page 66, Paragraph 2, Lines 1-5. The Draft TMDL states “The evaluation shows that the complete remediation of any one source will not result in compliance with the numeric DO criteria”. The Draft TMDL further states “The most influential source is Upper Klamath Lake causing a sustained dissolved oxygen deficit of up to 5.1 mg/L during the summer.” These statements point to the

substantial impacts to water quality in the Klamath River from the very large organic matter loads from Upper Klamath Lake. As previously discussed in these comments, the Draft TMDL properly acknowledges that the effectiveness of TMDL implementation likely will not be known for several decades. Given this, DEQ should consider the water quality consequences of dam removal and other potential substantial modifications to the river before the allocations to Upper Klamath Lake are achieved.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #16: Page 70, Paragraph 1, Lines 1-6. The Draft TMDL states:

“The results of model scenarios demonstrate that dissolved oxygen numeric criteria cannot be achieved under the estimated natural condition. Oregon’s water quality standards stipulate that, in this case, anthropogenic activities cannot decrease dissolved oxygen by more than 0.20 mg/L. The natural baseline condition, loading capacity, waste load and load allocations were determined using the water quality model. NCRWQCB (2010) indicates the TMDL developed to achieve Oregon’s water quality standards will achieve the applicable California objectives at the stateline.”

Only one “natural baseline condition” is defined in this Draft TMDL. More care should be taken to build and present a natural condition (or, rather a set of natural conditions) that include a range of possible or likely conditions. This is particularly important given the wide range of conditions produced by the Upper Klamath Lake TMDL model at Link River dam.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #17: Page 71, Paragraph 3, Line 4-6. The Draft TMDL states “Accretion and depletion flows in Keno impoundment that were necessary for reproducing water surface elevations in the current condition model were removed for the natural conditions model.” The accretion and depletion term represents model-introduced uncertainty, gage error, and un-gauged flow that could come from agricultural returns, groundwater gains and losses, or spring flows. The accretion and depletion values coming from “natural” sources, such as groundwater and spring flows, should be retained in the model because they would have been in place under “natural” conditions. Removing them would seem to make the model less accurate overall.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #18: Page 81, Paragraph 1. The Draft TMDL states “Dams differ from the others [sic] sources described above. Rather than adding nutrients to the system, they alter the hydraulics which leads to a contribution to the impairments.” The Draft TMDL should clarify that dam-altered hydraulics do not necessarily contribute to impairments, but can also improve conditions and lessen impairments (including retention of nutrients).

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #19: Page 81, Table 2-10. On page 39, the Draft TMDL indicates that a change of 0.1 mg/L dissolved oxygen is not measurable given the accuracy of instrumentation used to measure dissolved oxygen in field settings. There is also no discussion of the variability inherent to the Draft TMDL model itself, which also affects the accuracy of modeled results. The text on page 81 indicates that the difference between the allocations with dams and allocations without dams was calculated for the 7-day and 30-day averages and that “the greater of the two became the dissolved oxygen allocations in

Table 2-10.” If this is the case, and 0.1 mg/L cannot be accurately measured, then any augmentation requirements less than or equal to 0.1 mg/L should not be presented. PacifiCorp recommends that DEQ remove the July Keno augmentation of 0.01 mg/L and the J.C. Boyle reservoir October value of 0.07 mg/L from Table 2-10.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #20: Page 84, Section 2.8.1 *Uncertainty Analysis*. The uncertainties highlighted in this section should be quantified with an uncertainty analysis. Instead, there is simply a blanket statement about uncertainty analysis. The Environmental Fluid Dynamics Code (EFDC) is discussed herein, but not included in Oregon river reaches.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #21: Page 85, Paragraph 5, Lines 1-3. *Model Input Uncertainty*. The Draft TMDL states: “Given the dominance of Upper Klamath Lake outlet conditions on the Klamath River in Oregon and the uncertainty associated with this boundary condition, DEQ concludes that this is the largest source of uncertainty in regard to the current model representation.” As stated in previous comments, the Draft TMDL makes the important points that Upper Klamath Lake conditions are the key drivers of water quality conditions in the Klamath River downstream of the lake, and these lake conditions hold substantial uncertainty for Klamath River TMDL compliance. If the proposed TMDL is unachievable, then either (1) the water quality criteria or “targets” on which the TMDL is based are unnecessary to protect beneficial uses, or (2) the beneficial uses are not attainable. In the former circumstance, the appropriate actions before establishing the TMDL are either to reconsider the water quality “targets” that interpret the water quality criteria or to adopt and obtain EPA approval of revised water quality criteria. In the latter circumstance, the appropriate action before establishing the TMDL is to conduct a Use Attainability Analysis to specify the attainable beneficial uses.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #22: Page 87, Section 2.8.2 *Conservative Assumptions*. The conservative assumptions discussed in this section emphasize the fact that Klamath River water quality dynamics are complex and vary considerably in space and time. Even though the numerical model included a wide range of parameters, constants, and coefficients, the model does not include all relevant processes. For example, as noted in our 2010 comments the model has the following limitations affecting uncertainty:

- The model includes only a single algae group for J.C. Boyle and Keno reservoirs.
- The model includes only a simple sediment model in both the river and reservoirs.
- The model includes incorrect partitioning of organic matter at Link River dam.
- The two-group algae model for Keno reservoir (which represents healthy and unhealthy algae, and not two separate algae species) is completely untested and its parameter values have no basis.
- The available data for modeling are limited in winter throughout the system.
- Only a single year is modeled for the analysis and the validation period using 2002 data does not appear to have been used to assess improved model performance.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #23: Page 130, Paragraph 1; Page 145, Paragraph 5. PacifiCorp reminds DEQ that PacifiCorp will submit a TMDL Implementation Plan in accordance with Section 6.3 of the KHSAs. The TMDL implementation plan provisions of the KHSAs govern this issue in lieu of OAR chapter 340, division 042, which is preempted by the Federal Power Act.

DEQ Response: DEQ looks forward to the TMDL Implementation Plan and planning. DEQ also acknowledges the amount of work and resources PacifiCorp has invested in the Klamath River to better understand water quality.

PacifiCorp Comment #24: Page 131, Fourth bullet. The Draft TMDL states that DEQ, the North Coast Regional Water Quality Control Board, and EPA Regions 9 and 10 have developed a Memorandum of Agreement that establishes a framework for joint implementation of the Klamath River and Lost River TMDLs. The fourth bullet on page 131 describes one of the MOA “commitments” to “Explore engineered treatment options such as treatment wetlands, algae harvesting, and package wastewater treatment systems to reduce nutrient loads to the Klamath River and encourage implementation of these options where feasible...”. This is the only statement in the Draft TMDL that refers to such water quality treatment options and technologies. PacifiCorp recognizes that the Draft TMDL may not be the appropriate process or document for providing detailed assessment of implementation options and technologies. However, at a minimum the Draft TMDL should reference work conducted under Interim Measure 11 of the KHSAs. The Interim Measure 11 studies have evaluated the applicability of treatment wetlands, algae harvesting, oxygenation, and other water quality improvement measures for use in the Klamath River. Information from these studies, all of which are available on the PacifiCorp Klamath Hydroelectric Project website (<http://www.pacificorp.com/es/hydro/hl/kr.html>), would help provide context for what DEQ would consider as realistic and feasible methods for the very large reductions in nutrients and organic matter that the Draft TMDL will require.

DEQ Response: Please see response to PacifiCorp #23.

PacifiCorp Comment #25: Page 139, Table 4-3. The dates on this table all reflect the 2010 dates for the prior version of the Draft TMDL and WQMP. The table should be updated to reflect the current expected schedule for finalization of the Draft TMDL and the corresponding timeline for implementation of the WQMP.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #26: Page 144, Paragraph 4, Line 6-8. The Draft TMDL states “DEQ encourages USBR to pursue innovative changes to project operations including reduction of discharge to the Klamath River from Lost River Diversion Channel (LRDC) to address their combined pollutant load reductions for Klamath Straits Drain and LRDC.” The Draft TMDL should provide additional details on the types and examples of “innovative changes to project operations” that are envisioned by this statement. These additional details are essential in providing the reader of the Draft TMDL with a context for what DEQ would consider as “innovative changes to project operations” that would be realistic and feasible for the large load reductions from Klamath Straits Drain and LRDC that the Draft TMDL will require.

DEQ Response: Please see response to PacifiCorp #3.

PacifiCorp Comment #27: Page 151, Paragraph 1. *Water Quality Improvement Accounting and Tracking Program*. This entire section should be updated to reflect the current status of the Klamath Tracking and Accounting Program (KTAP). Through 2011 PacifiCorp worked in cooperation with the North Coast Regional Water Quality Control Board, DEQ, and U.S. Environmental Protection Agency Regions 9 and 10 and other interested parties to develop the KTAP. The KTAP provided a structure through which water quality improvements could be tracked and investments in water quality improvements could be identified to maximize the benefits of those investments. A Protocol Handbook was completed in 2012 (Klamath Watershed Partnership and Willamette Partnership 2012). PacifiCorp participated in the April 2011 KTAP training and contracted with The Freshwater Trust on a nutrient reduction pilot project in the Klamath River basin. The Freshwater Trust evaluated the protocols in the handbook by applying them to a pilot project to account for and track the water quality benefits derived from restoration projects.

DEQ Response: Please see response to PacifiCorp #3.