NATIONAL POLICY CONSENSUS CENTER
Hatfield School Of Government

MEMORANDUM

TO: Mid-Coast Basin TMDL Dissolved Oxygen (DO) Technical Working Group (TWG) Members
FROM: Megan Kmon and Turner Odell, Oregon Consensus (OC)
SUBJECT: DRAFT Action Items from November 19 Meeting
DATE: January 11, 2016

This memo follows up on the 1st meeting of the Mid-Coast Basin Implementation Ready (IR) Total Maximum Daily Loads (TMDLs) Dissolved Oxygen (DO) TWG, held at the Newport Recreation Center in Newport, Oregon, on November 19, 2015. The memo includes proposed future meeting dates, identified action items, meeting attendance, and summaries of key topics discussed.

UPCOMING MEETINGS

Meeting	Date	Location
LSAC 11th Meeting	Following completion of the next round of TWG meetings	TBD
DO TWG 2nd Meeting	First quarter 2016	TBD
Temperature TWG 6th Meeting	First quarter 2016	TBD
Sediment TWG 13th Meeting	First quarter 2016	TBD
Bacteria TWG 17th Meeting	February 9, 2016	TBD

ACTION ITEMS

Action Item	Who	Date
1. <u>Action Items</u> • Prepare Action Items memo and distribute to TWG and Project Team members	Megan and Turner *(OC with DEQ)*	Complete
2. <u>Documents to Website</u> • Post presentation and meeting documents to project website	David *(DEQ)*	By Jan 15, 2016

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3. <u>Finalize DO TWG Membership</u> • Email David and Turner indicating if you wish to be a member of the TWG	DO TWG meeting attendees and any other interested parties	ASAP
4. <u>Data for DO Modeling and Analysis</u> • Send email to TWG members requesting information on available DO data not previously submitted to DEQ	Dan *(DEQ)*	By Jan 15, 2016
5. <u>DO Monitoring for 2016</u> • Solicit input from TWG members on proposed DO monitoring for 2016 • Consolidate and distribute responses	David *(DEQ)* David *(DEQ)*	By Jan 15, 2016 Next DO TWG Meeting
6. <u>Watershed Modeling Sequencing</u> • Solicit input from TWG members on sequence of the watersheds to be modeled after the Alsea • Develop a watershed modeling workplan	Dan *(DEQ)* Dan and David *(DEQ)*	By Jan 15, 2016 Next DO TWG Meeting

ATTENDANCE

<u>Project Team</u>
Dan Sobota *(DEQ)*, David Waltz *(DEQ)*, Ryan Michie *(DEQ)*

<u>Facilitation</u>
Turner Odell *(OC)*, Megan Kmon *(OC)*

<u>DO TWG Potential Members and other Attendees</u>
Katie Duzik *(OWEB)*, Paul Engelmeyer *(Native Fish Society)*, Stephen Hager *(Siuslaw Watershed Council)*, Wayne Hoffman *(MidCoast Watersheds Council)*, Michelle Long *(ODFW)*, Paul Measeles *(ODA)*, Una Monaghan *(Salmon-Drift Creek Watershed Council)*, Melissa Newman *(Lincoln SWCD)*, Tyler Pedersen *(Siuslaw Watershed Council)*, Steve Steiner *(Eugene BLM)*, Julie Turner *(BLM)*, Stan van de Wetering *(Confederated Tribes of the Siletz Indians)*

<u>Project Team Attendees by Phone</u>
Alan Henning *(EPA Region 10)*, Jenny Wu *(EPA)*, Marty Jacobson *(EPA)*

MEETING NOTES

Opening Remarks *(Turner Odell, OC)*

Turner welcomed the group to the inaugural meeting of the DO TWG. He gave a brief refresher of OC's role, which is to provide facilitation support to DEQ's Mid-Coast Basin TMDLs development process. For any long-standing participants, Turner reminded the group that he is OC's primary facilitator for this process, and that Peter Harkema is not actively involved except as back-up. He reviewed the meeting objectives, which were to discuss updates from DEQ and the group and to review the current status of DO technical work.

Project Team Updates *(David Waltz and Ryan Michie, DEQ)*

- *(David)* The next LSAC meeting is tentatively planned for January 2016. David will send out a Doodle poll to LSAC and TWG members to identify several potential dates (see Action Items).
- *(David)* Sediment TWG work is still pending the completion of the literature review. The earliest possible time for the next meeting is January 2016.
- *(Ryan)* DEQ is targeting the first quarter of 2016 for the next Temperature TWG meeting to discuss cold water refugia, modeling status, progress and results, next steps for scenario modeling, and updating models with LiDAR data. Ryan will confirm whether the Lane County LIDAR data are publically available.
- *(Ryan)* NOAA recently released its Biological Opinion on Oregon's water temperature standard, specifically the identification and protection of cold water refugia in the Columbia and lower Willamette fish migration corridor areas. EPA will be the lead for mapping the Columbia while DEQ will lead the mapping for the lower Willamette. DEQ is developing a work plan for the project which Ryan may discuss at the next Temperature TWG meeting.
- *(David)* DEQ plans to send an overall process update to the LSAC and TWGs by the end of this year.
- *(David)* DEQ is waiting for a decision from EPA and NOAA on the 2016 Clean Water Act §319 Nonpoint source grant program funding. DEQ will decide within the next few weeks whether or not to issue an RFP.
- *(David)* Basin summaries for Oregon's Statewide Toxics Monitoring Program are completed and will be posted on the DEQ's Laboratory website within the next few weeks. David is happy to speak with anyone who has questions.(Note: Report is now available at: http://www.deq.state.or.us/lab/wqm/docs/2015-TMP_FinalReport.pdf)

Participant Updates

Wayne Hoffman mentioned that the public comments on NOAA's draft Oregon Coast Coho Recovery Plan are very general with regard to water quality, so he suggested that anyone who is interested might want to consider making more specific comments. David Waltz mentioned that one response will be made by the state on behalf of all the agencies, coordinated by the Governor's office.

DO TWG Status and Membership *(David Waltz, DEQ)*

David reiterated that, although there was initial discussion of a combined DO and Temperature TWG, the Project Team ultimately decided to keep them separate for simplicity and to ensure that stakeholders with specific interests and background be provided an opportunity to focus on one or the other topic. David asked that TWG meeting attendees let him and Turner know whether or not they would like to be TWG members (per the Action Items), as should anyone else who didn't attend the meeting but is interested in being a member.

DO Technical Work *(Dan Sobota, DEQ)*

Review of TMDLs Process and DO TWG Objectives

There are four primary phases involved in addressing a water body that is impaired: 1) identify stream segments that are impaired and the water quality parameters or pollutants that are not meeting the standard, 2) develop TMDLs – the maximum loading in each waterbody for each pollutant for which there are exceedances, 3) develop a Water Quality Management Plan (WQMP) and implementation plans that identify strategies and actions to achieve the TMDLs, and 4) implement and evaluate these plans. This TWG is starting the second phase. DEQ, via the DO TWG, is partnered with the pubic in the TMDL development process. DEQ is looking to its basin stakeholders for advice and innovation in developing the TMDLs and WQMPs and will incorporate TWG members' input to the maximum extent possible.

DO Concepts

Dan summarized three primary factors that affect DO concentration and percent saturation in natural waters: 1) air-water exchange (K), which can increase or reduce DO, 2) gross primary production (GPP), which increases DO, and 3) ecosystem respiration (ER), which reduces DO. Groundwater inflow and upstream reach conditions can affect downstream DO conditions. See Dan's presentation for more details about how DO TMDLs are developed and implemented across Oregon.
There are five classes of DO criteria in Oregon's water quality regulations that cover different waterbodies (based on designated beneficial uses and seasons), but only two apply in Mid-Coast freshwater rivers and streams: spawning and cold water (see Handout).

History of DO TMDLs in Oregon

Dan provided a list of EPA-approved DO TMDLs in Oregon, plus three rivers for which TMDLs are currently being developed, along with their associated pollutants. In response to a question, Dan and Ryan said that one of the listed rivers – the Tualatin – has positively responded to management actions to lower nutrient loads.

Status of DO in the Mid-Coast Basin

Dan briefly discussed DEQ's 2010 Integrated Report and the process for evaluating which criteria apply to a water body based on the data. He then reviewed the Clean Water Act §303(d) categories, emphasizing that it is Category 5 waterbodies – impaired waterbodies that require a TMDL – that are the focus of this current work. Dan confirmed that eventually identifying the sources and reducing the pollutants in specific watersheds to meet water quality standards is the end objective of developing these TMDLs.

Proposed Analysis Approach

Dan discussed a 4-step process to develop DO TMDLs: 1) collect continuous data and supporting information, 2) evaluate the data to determine what is useable, 3) populate a reach-scale model with the useable data to determine what factors are affecting DO, and 4) develop a watershed-scale model to identify pollutant sources that are ultimately negatively impacting DO.

1) The continuous DO data sets that Dan is using were collected in 2008 from 17 datasondes placed in five Mid-Coast Basin rivers by DEQ. Valid continuous data usually appears either steady-state or non steady-state when examined. Steady-state data generally requires steady flows and consistent weather patterns. Non steady-state data result from changes in flow, weather pattern, constituent loading, etc., during the monitoring period. Tools to model steady-state data are widely available; non steady-state data can be used in modeling as well, but require additional information for the modeling process.Data was typically collected in three to five-day periods; the *average* values during a collection period are used.

There was a discussion about how the local groups present at the meeting could collect more data and share it with DEQ. David suggested that they email him and Dan with specific proposals
2) To evaluate the data to determine what is useable, Dan is using a nighttime regression method based on air-water exchange and ecosystem respiration (Izagirre et al. 2007).. Temperature-dependent equations are then used to derive other variables at other times to determine what factors are impacting DO.

3) Dan stated that DEQ has selected a mechanistic model called QUAL2Kw to model reach-scale interactions to assess the primary factors influencing DO. In this context, there are two types of models that can be used: mechanistic or statistical. Mechanistic models seek to explain complex relationships through a hypothesized relationship between data variables based on physical processes. In Statistical models, the hypothesized relationships between variables are based on how the variable relationships are best described. The Project Team concluded that the QUAL2Kw model is the best option because it can quantify influences of factors that can be directly linked to management decisions. It is also EPA-approved, peer-reviewed, and has been used for

developing TMDLs in Oregon and Washington and elsewhere. Dan showed initial model outputs for the 2008 Alsea river data, which look promising. Uncertainty and sensitivity analyses still need to be done, and more data would be helpful for calibration and validation. Based on initial results from two rivers in spring/summer, it is not yet clear what factors influence DO. On four rivers in fall, high BOD seems to be an important factor controlling dynamics of DO.

There was significant discussion among the group about how certain factors influence DO concentrations or saturation (or vice-versa), including pH, metals (e.g., DO affects solubility), nitrates, and hyporrehic flow including well pumping. Some questions were either seasonal, site or scale-dependent, and will need to be considered in evaluating data and developing models for specific areas. These are factors that will need to be ranked in terms of importance and DEQ acknowledged that local knowledge will be useful in assessing which factors to include for specific reaches or segments under evaluation. The influences of all of these factors can be evaluated with the proposed reach scale and watershed models.

4) After the reach-scale modeling phase is complete and primary factors influencing DO have been identified for a specific segment, the next phase will be to build watershed-scale models to evaluate the potential pollutant sources influencing the DO. Dan mentioned three widely available models that DEQ is considering (SWAT, HSPF, and VELMA); which one(s) to be used will be discussed at future TWG meetings. A work plan will be developed to identify the sequence of watersheds to be modeled, based on a variety of considerations, including: data availability, resources, and TWG input. (see Action Items).

Several attendees felt that the Siletz should be a high priority for both data collection and modeling due to anadromous fish diversity and concentration of water withdrawals Dan pointed out that continuous DO data for the Siletz are, to DEQ's knowledge, nonexistent at this time. DEQ agreed that data gaps and future data collection and should be discussed as part of this process. This topic will be re-visited as future data collection efforts are addressed and a watershed sequencing workplan is developed.

<u>Literature Cited</u>

Izagirre, O., Bermejo, M., Pozo, J. and Elosegi, A., 2007. RIVERMET©: An Excel-based tool to calculate river metabolism from diel oxygen–concentration curves. *Environmental Modelling & Software*, *22*(1), pp.24-32.