



## MEMORANDUM

**TO:** Mid-Coast Basin TMDL Dissolved Oxygen (DO) Technical Working Group (TWG)  
**FROM:** Turner Odell, Oregon Consensus (OC)  
**SUBJECT:** DRAFT Action Items from September 26<sup>th</sup> DO TWG Meeting #5  
**DATE:** November 3, 2017

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This memo follows up on the 5<sup>th</sup> meeting of the Mid-Coast Basin Implementation Ready (IR) Total Maximum Daily Load (TMDL) Dissolved Oxygen (DO) Technical Working Group (TWG), held at the Guin Library at the OSU Hatfield Marine Science Center in Newport, Oregon, on September 26, 2017. The memo includes proposed future meeting dates, identified action items, meeting attendance, and summaries of key topics discussed.

## UPCOMING MEETINGS

Meeting	Date	Location
Bacteria TWG	First quarter 2018	TBD
DO TWG	TBD in first quarter 2018	TBD

## ACTION ITEMS

Action Item	Who	Date
1. <u>Action Items</u> <ul style="list-style-type: none"><li>Prepare draft Action Items memo and distribute to TWG members</li></ul>	Turner (OC with DEQ)	Complete
2. <u>Documents to Website</u> <ul style="list-style-type: none"><li>Post presentation and meeting documents to project website (or distribute via ftp site)</li></ul>	David (DEQ)	In process

<p>3. <u>Biosolids applications</u></p> <ul style="list-style-type: none"> <li>• DEQ to check on permitted sites and applications of biosolids in Upper Yaquina watershed</li> </ul>	David/Dan (DEQ)	ASAP
<p>4. <u>Other fertilizer application</u></p> <ul style="list-style-type: none"> <li>• ODF to check on potential applications of fertilizers in Upper Yaquina watershed</li> </ul>	Terry Frueh (ODF)	Information received from ODF's FERNS database
<p>5. <u>Technical Work</u></p> <ul style="list-style-type: none"> <li>• Provide model technical report on HSPF and QUAL2Kw model for the Upper Yaquina Watershed for review</li> <li>• Re-circulate white paper providing scientific basis for the dissolved oxygen standard</li> </ul>	<p>Dan (DEQ)</p> <p>Dan (DEQ)</p>	<p>November 2017</p> <p>ASAP</p>

## ATTENDANCE

### Project Team Members

Dan Sobota (DEQ), David Waltz (DEQ)

### Facilitation

Turner Odell (OC)

### Dissolved Oxygen TWG Members/Alternates

Terry Frueh (ODF), Stephen Hager (Siuslaw Watershed Council), Wayne Hoffman (Mid-Coast Watershed Council), Paul Measeles (ODA), Jo Morgan (ODA), Kyle Terry (Siuslaw Watershed Council), Jeff Young (NOAA), Renée Coxen (ODFW).

### Other Attendees (including guests from the Mid-Coast Water Planning Partnership)

Kyle Abraham (ODF), Jim Adler (Interested Citizen), Cyndi Karp (Ecosystem Advocate), Greg Peterson (Oregon Small Woodlands Association), Mike Powers (ODA), Paul Robertson (Salmon Drift Creek Watershed Council), Dave Westgate (Lincoln SWCD),

## MEETING NOTES

### Summary Of Key Themes

During the 5th meeting of the Mid-Coast TMDL Dissolved Oxygen (DO) Technical Working Group (TWG) participants heard a report on the status of DEQ efforts related to DO in the Mid-Coast region, including: (1) an update on coordinated monitoring activities in the Salmon, Siletz, and Siuslaw River basins in 2017; (2) an overview of the HSPF watershed model in the Upper Yaquina River watershed; (3) calibration results of QUAL2Kw model for the Upper Yaquina River; (4) plans for monitoring, analysis, and modeling for autumn 2017. Specific feedback sought from the TWG included: (1) regarding the technical modeling approach – information on local conditions for individual reaches and key landscape variables (e.g., land use practices), (2) TWG member reactions to initial model results for Upper Yaquina, and (3) reactions/input regarding the Fall 2017 monitoring plans, including DEQ's schedule and local participation.

The meeting agenda, meeting materials (including PowerPoint presentations) will be available through the DEQ Mid-Coast TMDL project website at: <http://www.oregon.gov/deq/wq/tmdls/Pages/TMDLs-Basin-MidCoast-LSAC.aspx>.

### Model Review and Details

Dan began by reviewing the Hydrological Simulation Program – Fortran (HSPF) Model. The HSPF model provides watershed level estimates for flow and nutrient inputs along the modeling reaches for use by the in-stream water quality model (QUAL2Kw). The model is temporally and spatially explicit, and can be used to evaluate different landscape conditions and management scenarios. Information about how the HSPF model is applied to the Upper Yaquina Watershed is in Dan's presentation. Dan shared the results of post-calibration validation runs demonstrating that the model is predicting flow and nutrient inputs into the stream system accurately – especially during low flow periods that are of particular importance for assessing compliance with the standards.

Meeting participants had a number of questions and comments about the model and the calibration/validation:

- There was a question about how the model handled stockpiles of nutrients that might accumulate in sediments and be released during high flows. Dan answered that this was something that would be addressed by the instream water quality model – QUAL2Kw.
- A participant asked how waterfowl inputs could be accounted for. Dan responded that information on significant waterfowl inputs could be plugged into the model if there were information/data available. One member offered specific information about level of waterfowl usage in the Upper Yaquina, and suggested that it was not significant.
- There was a question about biosolids and whether there was an accounting for agricultural applications of biosolids to pastures (as agricultural amendment/fertilizer and disposal technique for wastewater treatment plant waste). It was noted that such sites/activities would be permitted by DEQ and that DEQ would confirm the existence/status of biosolids disposal sites in the Upper Yaquina.
- There was a follow-up question about the use/application of other fertilizers or soil amendments in the watershed – such as fertilizers derived from ground up shrimp or crab shells or nutrient applications pre-harvest on commercial timberlands. It was suggested that such treatments have been characterized as “experimental” and have been used on trees approximately 5 years pre-harvest. ODF agreed to check into fertilizer use on commercial timber lands in the Upper Yaquina watershed area.
- It was noted that since the LiDAR was collected used in this modeling effort (2011 – 12), there may have been significant changes to some areas including, e.g., riparian tree plantings and 5 years of subsequent growth in some areas. DEQ agreed to review the LIDAR and compare with recent aerial photography.

Dan explained and shared calibration results for the Upper Yaquina river QUAL2Kw model for the July 2016 monitoring data. Model runs showed a reasonably good fit for dissolved oxygen in terms of measured values matching modeled values at four stations. Dan applied a sensitivity analysis (using a Monte Carlo simulation procedure as described in the presentation) to determine which categories of primary factors have the largest effect on estimated dissolved oxygen. These results suggested that factors affecting biological productivity, including sunlight, temperature, and nutrients, were most important.

Meeting participants also had questions and comments about the QUAL2Kw model and the calibration and sensitivity analysis, including the following:

- Sensitivity analysis results should more clearly demonstrate the role of temperature with respect to dissolved oxygen through its impact on biological productivity.
- Members discussed if the decrease in DO at high (storm associated) flows in October 2016 could have been due to the additional oxygen demand from sediment stirred up into the water column.

- One participant commented that looking at overall daily averages, the results show dissolved oxygen stays largely above the regulatory threshold – and therefore might not be likely to present a problem for fish. DEQ responded that the adopted criteria/standards are based on daily minimum levels of DO (not overall averages) – and that is the measure that the TMDL must be designed to meet. DEQ agreed that it would recirculate the white paper that describes the scientific basis for the dissolved oxygen criteria for salmonids.

Dan opened the floor for other questions and comments related to dissolved oxygen.

- A participant made an observation about dissolved oxygen issues in Beaver Creek – noting that there are significant reed canary grass problems in the watershed that may have an impact on DO. It was suggested that looking at reed canary grass management could be a scenario that is used for modelling or monitoring design. It was observed that the extensive wetlands in the system also affect DO levels due to vegetation decomposition. This environment will require attention to monitoring and analytical design.
- Similarly, it was suggested that the impact of increased beaver activity (dam building) could be a modeled scenario.
- In response to questions, Dan noted that this modeling effort does not address toxics in the system. The modeling also does not address the impact on DO of high turbidity during periods of high flows because the TMDL modeling is focused on baseflow periods (i.e., July into October) that are historically viewed as the critical times that correspond with either elevated temperature or onset of the designated spawning period.

#### **Participant Announcements**

- The ODA Local Advisory Committee for the Mid-Coast region will be meeting on October 26 from 5:00 to 9:00 PM in Yachats to review the Mid Coast Agricultural Water Quality Management Area Plan.
- The 2017 Oregon Lakes Association Conference will take place Friday, October 20, 2017 1:00 PM in Florence, Oregon.
- DEQ forwarded its recommendations for 2017 Section 319 grant funded projects to EPA and expects approval and award from EPA in the near future.