Washington Department of Ecology
Project Work Plan Memo

November 30, 2016

TO: Karin Baldwin, Client Lead, Eastern Regional Office Water Quality Section
David Knight, Unit Supervisor, ERO-WQ
Jim Bellatty, Section Manager, ERO-WQ

THROUGH: Jim Ross, Unit Supervisor, Environmental Assessment Program, ERO
Tom Mackie, Section Manager, EAP, Eastern Operations Section

FROM: Paul J. Pickett, Project Manager, EAP, Eastern Operations Section

SUBJECT: Project Work Plan: Lake Spokane "Measuring Improvement" Literature Search

Tracker Code: 16-021

Problem Description

The Spokane River dissolved oxygen total maximum daily load (DO TMDL) approved in 2011 used the CE-QUAL-W2 model to evaluate dissolved oxygen in the river and reservoir under a variety of conditions. The Department of Ecology (Ecology) found that conditions in the lacustrine portion of Lake Spokane did not meet the water quality standards for DO, with the segment in front of Long Lake Dam having the most impairment. The source of the impairment is nutrients from point and non-point sources.

By 2020, a variety of point and nonpoint implementation actions will occur. From 2021-2023, Ecology anticipates conducting a 10-year assessment of the Spokane River and Lake Spokane to determine progress toward meeting the TMDL allocations.

However, stakeholders have expressed interest in exploring alternatives in addition to the CE-QUAL-W2 model to assess the progress of implementing the DO TMDL. Therefore, Ecology's Eastern Regional Office Water Quality Section (ERO-WQ) would like the Environmental Assessment Program (EAP) to conduct a literature search. This search would identify and evaluate some alternative methods or analyses that could be used to measure improvements in water quality, reservoir health, and support for aquatic life.

Study Objectives

- Identify and summarize scientific literature which documents ways to assess reservoir water quality and aquatic habitat health, focusing on processes related to the DO impairments addressed by the TMDL.

- Analyze and evaluate the identified literature in terms of:
  - The relevance of methods as indicators for TMDL implementation targets and other factors such as ecological resilience and diversity.
  - The ability of methods to characterize trends and rates of recovery.

- Identify and recommend the most feasible and useful methods that can inform the DO TMDL 10-year assessment.

Scope-of-Work

- Conduct a literature search to meet project objectives.
  - Possible areas to explore include:
    - Alternative ways to characterize measurements of ambient dissolved oxygen
    - Simplified modeling or analysis methods for DO and other water quality parameters
    - Metrics for the biological communities in the reservoir aquatic ecosystem, such as phytoplankton, zooplankton, fish, and other aquatic species
    - Tools to evaluate the quantity and quality of data needed, variability of metrics, rate of ecosystem recovery, and equilibrium indicators.
  - Possible sources of relevant information include:
    - Articles published in peer-reviewed journals
    - Academic and professional text books on limnology and aquatic ecology
    - Publications and other information from government agencies, such as the U.S. Environmental Protection Agency, U.S. Geological Survey, and other federal and state agencies
    - Information from Washington and other states for projects similar to the DO TMDL.

- Work with ERO-WQ and EAP staff to ensure that the results of the search are relevant, useful, and consistent with policies established by Ecology's Water Quality Program.

- Communicate study results through a published report and presentations to local stakeholders.

Schedule

Product

Final Report	
Product lead and support staff	Paul Pickett
Schedule:	
Supervisor and Client Draft due	June 2017
Internal Policy Review Draft due	July 2017
External Draft due	September 2017
Final report published	December 2017

cc: Carol Smith
Melissa McCall (for Activity Tracker)