# UPPER KLAMATH AND
LOST RIVER SUBBASINS TMDL

APPENDIX G:
ADDITIONAL KLAMATH RIVER MODEL RESULTS TO SUPPORT COLUMBIA FOREST PRODUCTS' WASTE LOAD ALLOCATION

**Final
December 2010**
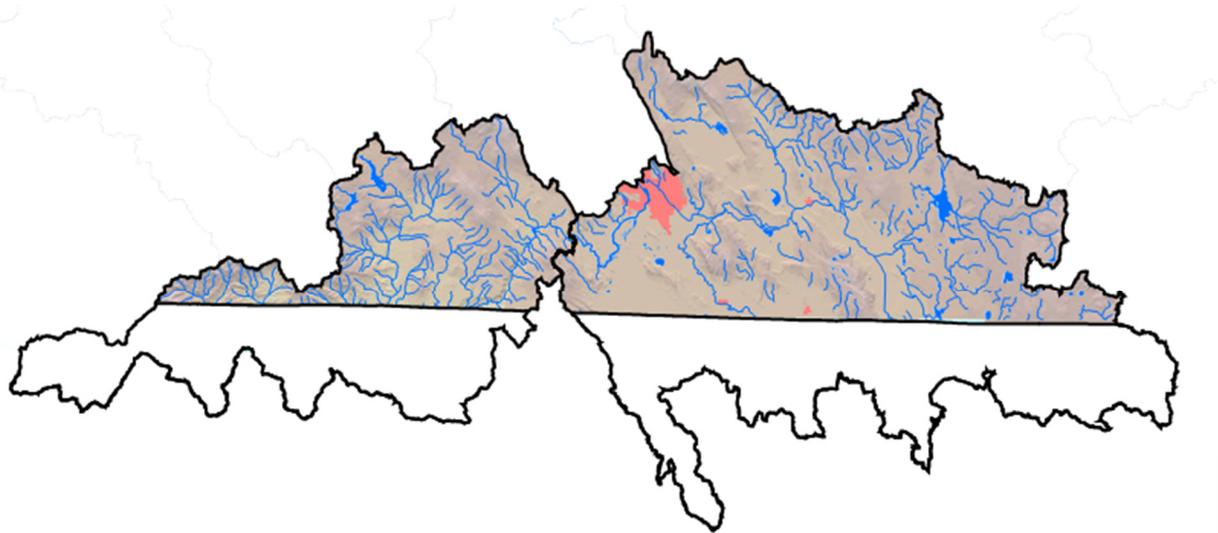
*THIS DOCUMENT IS SUPPLEMENTAL TO THE
KLAMATH RIVER TMDL*

DEQ

State of Oregon
**Department of
Environmental
Quality**

This page intentionally left blank.

It was DEQ intention to use Columbia Forest Products' current loading as a starting point to compute its waste load allocation (WLA). The draft TMDL was calculated using year 2000 loading (averaging the three discharge events over the entire year). Because of the comments received on the draft TMDL, DEQ conducted further sensitivity analyses on the impact of Columbia Forest Products' effluent.

The sensitivity analysis was based on the draft TMDL, allocation without dams scenario (TOD2RN). The flow and concentration inputs for Columbia Forest Products' effluent were changed to represent the discharge from 2006 (the year with the greatest loading between 2000 and 2009, per comments by Columbia Forest Products, see DEQ's Response to Comments for this TMDL). The reported 5-day biochemical oxygen demand (BOD5) measurements were converted into CE-QUAL-W2 variables using the same assumptions stated in the TMDL (i.e. ratios between organic matter and specific nutrients). The source's effluent was represented dynamically, so that intermittent nature of the discharge was captured. Model results indicate that the 2006 representation of Columbia Plywood's effluent does not impact water quality. The maximum instantaneous increase in BOD5 concentrations between the two scenarios is 2% where the average change in BOD5 concentration <0.01% (see **Figure G1**). The variability in the difference between the two scenarios during the summer, with positive and negative changes, is likely due to the slight change in flow regime resulting in travel time changes. Changes to phosphorus and nitrogen concentrations are even less. This change in BOD5, nitrogen and phosphorus concentrations does not cause nor contribute to a DO or pH impairment (see **Figure G2**, for example).

Figure G1. Comparison of the model results for the allocation (without dams) scenario using the year 2000 effluent data (averaged of year) and 2006 effluent data (dynamic) at Miller Island.
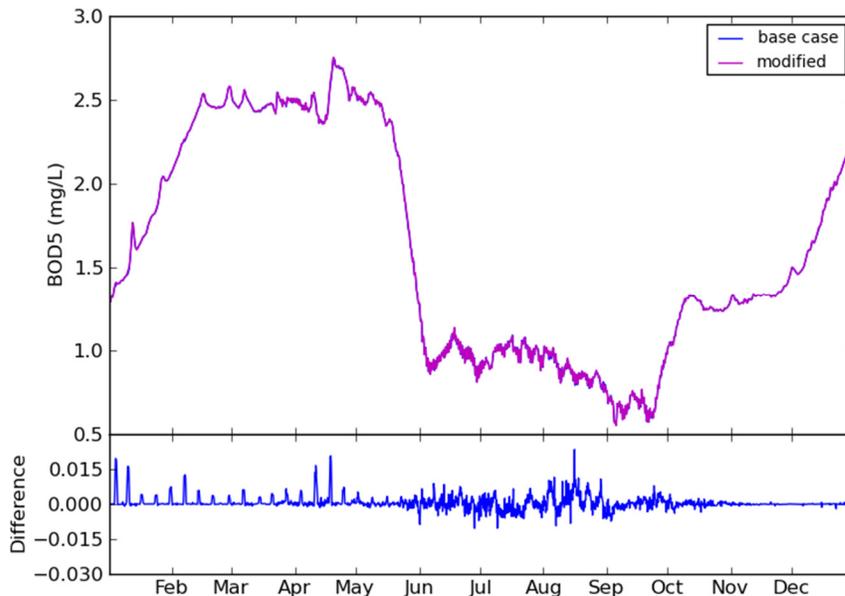
Figure G2. Comparison of the model results for the allocation (without dams) scenario using the year 2000 effluent data (as presented in the draft TMDL) and 2006 effluent data (dynamic) at Miller Island.
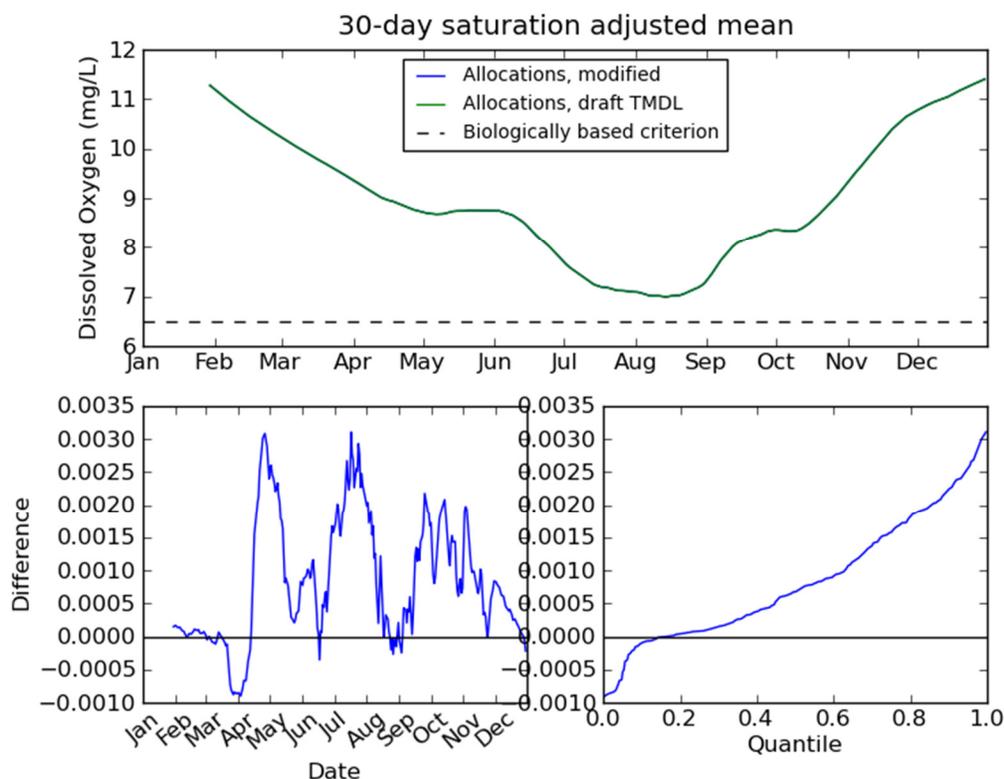
Based on the model results presented above, DEQ has increased the WLA for Columbia Plywood from what was presented in the draft TMDL (**Table G1**). The conceptual derivation of the WLA remains the same: current loading. However, the representation of 'current loading' has changed to be more reflective of actual discharge rates and concentrations. The WLA per discharge event is the current loading restrictions in the permit: 40 lbs / day BOD5 monthly average with a maximum of 80 lbs / day BOD5. Because the discharge is intermittent the WLA also restricts the frequency of discharge: shall not exceed 5 events per month in November through May and 2 events per month June through October. These frequencies are based operations reported between 2000 and 2009 and would have been exceeded in only 2 out of 120 months.

Table G1. Partial (revision). Point Source Waste Load Allocations using flow-weighted averages. Red ~~strikeouts~~ indicated draft TMDL values.

Source	Flow Rate Average 2000 (cfs)	Flow Rate Average 2000 (MGD)	Total Phosphorus Average (mg/L)	Total Phosphorus Allocation (lb/day)	Total Nitrogen Average (mg/L)	Total Nitrogen Allocation (lb/day)	BOD5 Average (mg/L)	BOD5 Allocation (lb/day)
Columbia Forest Products	Intermittent discharge		~~0.25~~	~~0.019~~ 2.1*	~~0.99~~	~~0.08~~ 10*	~~3.9~~	~~0.30~~ 40

*based on assumed ratio with BOD5