Draft Total Maximum Daily Loads for the Willamette Subbasins

Technical Support Document Appendix K: McKenzie River Wasteload Allocation Scenario Model Report

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State of Oregon
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This appendix summarizes the results of the CE-QUAL-W2 lower McKenzie River wasteload allocation model scenario.

Table 1-1: Thermal wasteload allocations scenario 3 (WLA3) for IP Springfield

NPDES Permittee WQ File# : EPA Number	Allocated Human Use Allowance (°C)	WLA period start	WLA period end	Annual 7Q10 River flow (cfs)	Effluent discharge (cfs)	7Q10 WLA (kcals/day)
International Paper - Springfield (Outfall 001 + Outfall 002) 96244 : OR0000515	0.12	5/1	6/15	2,459	28.8	730.418E+6
	0.20	6/15	9/1	1,538	28.8	766.687E+6
	0.18	9/1	10/31	1,630	28.8	730.535E+6

For calculation of the 7Q10 wasteload allocations shown in Table 1-1, annual 7Q10 and effluent discharge are rounded to the values shown in the table.

Modeling was performed for the critical low flow year of 2015. Modeling includes the Eugene Water and Electric Board (EWEB) Trail Bridge Powerhouse (NPDES permit file number 28393, Outfall 002). As summarized in TSD Appendix A, Section 4.10.2, Heat Source modeling indicates that a WLA for this discharge that corresponds to a 7DADM temperature impact of 0.03ºC will have up to 0.015ºC of impact in the McKenzie River near at its confluence with the South Fork McKenzie River near USGS gage 14159110 (McKenzie River above South Fork, Near Rainbow). This impact was added to the CE-QUAL-W2 McKenzie river boundary condition temperatures. The modeling also includes impacts of the ODFW Leaburg and McKenzie River hatcheries. The scenario modeled is referred to as WLA3TB (Wasteload Allocation scenario 3 plus impacts of EWEB Trail Bridge Powerhouse).

Note that flow rates for September 2015 were quite low relative to other years. The monthly average flow rate for September 2015 for USGS 14164900 McKenzie River abv Hayden Br, at Springfield was 1,579 cfs, which is less than the fall spawning period 7Q10 of 1,630 cfs. The next lowest September average flow rate for the 2008-2023 period of record was 1,756 cfs and the average September flow rate for all months for the period of record was 2,300 cfs. Because flow rates for the modeled year are less than 7Q10, modeled impacts during the fall spawning period may exceed allocated ΔTs. Note that this is acceptable, since ΔTs may exceed allocated ΔTs during the occasional time periods when river flow rates are less than 7Q10.

Figure 1-1 through Figure 1-3 show 7DADM temperature impacts for the WLA3TB scenario for the spring spawning period, summer non-spawning period, and the fall spawning period:

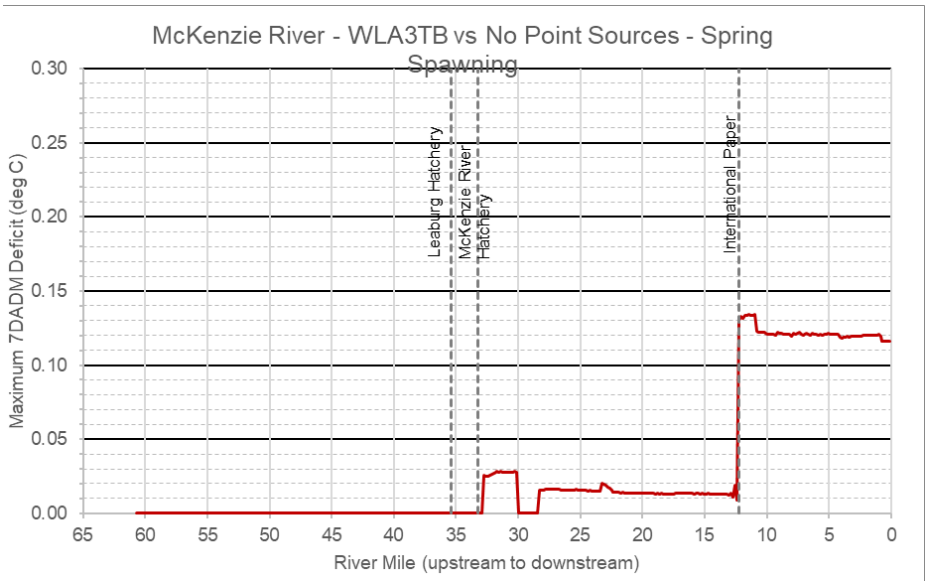

Figure 1-1: McKenzie River maximum 7DADM change in temperature from waste load allocations during the spring spawning period.

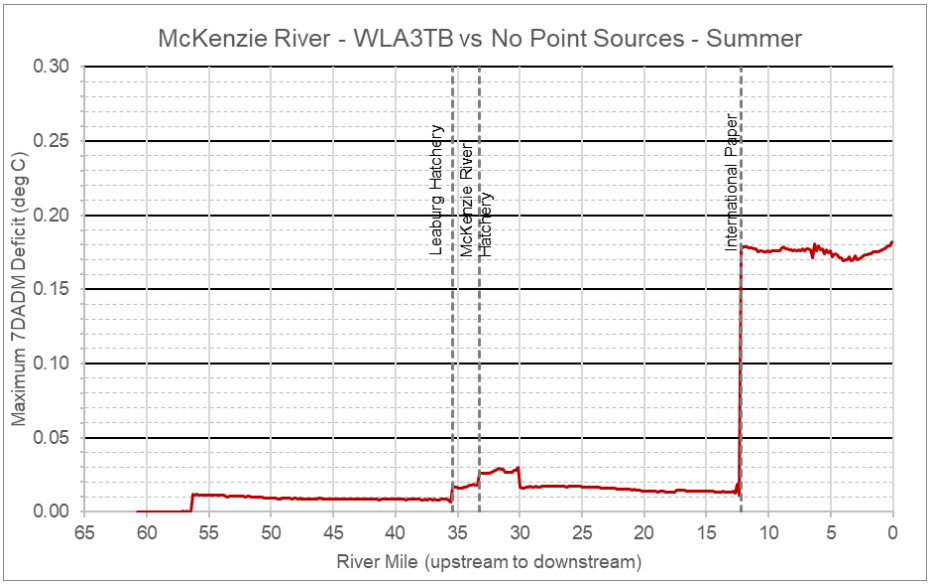

Figure 1-2: McKenzie River maximum 7DADM change in temperature from waste load allocations during the summer period.

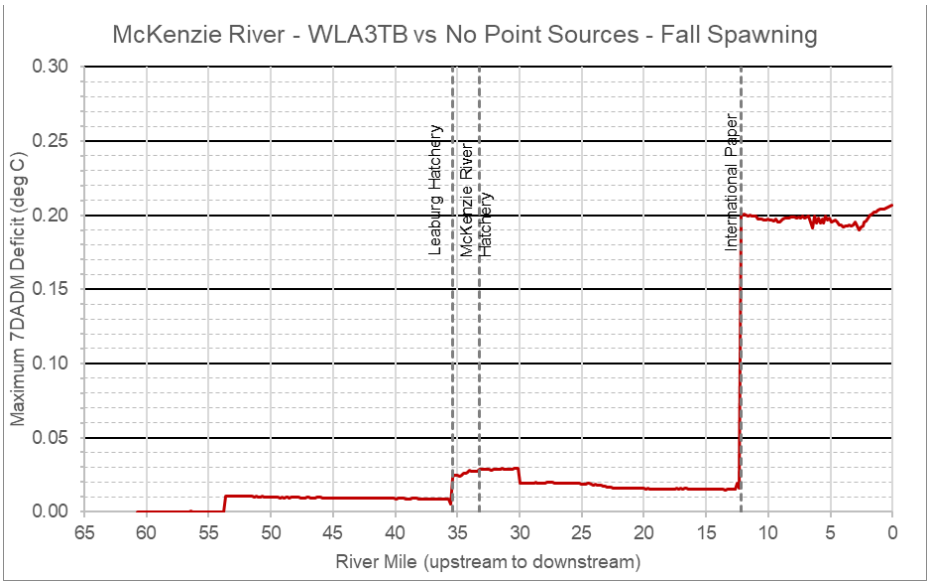

Figure 1-3: McKenzie River maximum 7DADM change in temperature from waste load allocations during the fall spawning period.

Note that the spring spawning period lasts until May 15 and the fall spawning period commences September 1.

The plots show the impact of the Trail Bridge WLA. The impact is 0.01ºC at the confluence of the McKenzie River with the South Fork McKenzie River (~RM 54). The impact slowly decreases but is still close to 0.01ºC near Leaburg and McKenzie River Hatcheries (~RM 35). The impact is 0.005ºC at the river mouth.

The impact of modeled point source impacts does not exceed 0.20ºC, except near the mouth of the McKenzie River during the fall spawning period. The impact only exceeds 0.20ºC for two days: October 5 and 6, 2015. Via data from the USGS gage near the outfall (USGS 14164900 McKenzie River abv Hayden Br, at Springfield), the 7-day average river flow was 1,551 and 1,550 cfs on October 5 and 6, which equate to 95% of the fall spawning period 7Q10 of 1,630 cfs.

Only 7DADM temperature impacts for days for which temperature exceed criteria (16ºC during summer non-spawning period and 13ºC during spawning periods) are exceeded for the No Point Source scenario are included. 7DADM temperature impacts at times when model calculated river temperatures are less than criteria may be greater than those shown.

The following is the recommended draft allocation of HUA for the McKenzie River downstream from IP Springfield (Table 1-2).

Table 1-2: Human use allowance allocations on the McKenzie River (McKenzie Subbasin) from International Paper Springfield's outfall to the mouth.

Portion of Human Use Allowance (°C)	Source or source category
0.21*	NPDES point sources
0.00	Dam and reservoir operations
0.02	EWEB Walterville project
0.00	EWEB Leaburg project
0.03	Other water management activities and water withdrawals
0.02	Solar loading from existing transportation corridors, existing buildings, and existing utility infrastructure
0.00	Solar loading from other NPS sectors
0.02	Reserve capacity
0.30	**Total**
Note: * NPDES permitted point sources are allowed up to 0.21°C cumulatively at the point of maximum impact.	

NPDES point sources impacts are shown in the plots above, except for up to 0.01ºC of impact which is provided to facilities covered by general NPDES permit. These allocations to facilities covered by general NPDES permits are not included in the model, so total impacts of point sources are as shown on the plots, plus 0.01ºC. Therefore, the maximum impact of WLA3TB plus general NPDES permits during the fall spawning period is 0.21ºC (0.20ºC + 0.01ºC), except for two days of unusually low flow during which impacts may be slightly greater than 0.21ºC if 0.01ºC of allocated impacts for general NPDES permits are fully utilized. During spring and summer impacts are less.