

State of Oregon
 Department of Environmental Quality

Memorandum

To: Snake River/Hells Canyon TMDL File **Date:** March 26, 2004
From: Dick Nichols, Bend WQ Section Manager
Subject: Documentation for Addendum to Snake River/Hells Canyon TMDL Order

On July 15, 2003, the Oregon Department of Environmental Quality (ODEQ), in conjunction with the Idaho Department of Environmental Quality (IDEQ), issued the Snake River/Hells Canyon Total Maximum Daily Load (TMDL). The TMDL was subsequently sent to the U.S. Environmental Protection Agency (EPA).

During the review of the TMDL by EPA, a couple of errors were discovered in the Total Phosphorus/Dissolved Oxygen TMDL and the Sediment TMDL. Both ODEQ and IDEQ have agreed to correct the errors and resubmit these TMDLs to EPA. Pursuant to ODEQ's rules concerning TMDLs, before Oregon can correct the errors and reissue the TMDLs, it must first place the corrections on public notice. Following Oregon's public notice process, the TMDLs will be finalized by both States and resubmitted to EPA.

The errors and proposed corrections to the errors are described below:

Issue #1: : Table 4.0.7 is intended to define the loading capacities for each segment. As submitted, however, it also includes load allocations which seems to confuse the issue. Table 4.0.7, as submitted to EPA, is below.

Table 4.0.7. Total phosphorus allocable load for segments in the Snake River - Hells Canyon TMDL reach based on the water column target concentration of 0.07 mg/L and calculated average flows (May through September).

Segment	Location	Load (kg/day)
Snake River Inflow	RM 409: Upstream Snake River Segment	1,461
Owyhee River	RM 396.7: Upstream Snake River Segment	75
Boise River	RM 396.4: Upstream Snake River Segment	256
Malheur River	RM 368.5: Upstream Snake River Segment	61
Payette River	RM 365.6: Upstream Snake River Segment	497
Weiser River	RM 351.6: Upstream Snake River Segment	144
Drains	Upstream Snake River segment (RM 409 to 335)	96
Ungaged flows	Upstream Snake River segment (RM 409 to 335)	145
Total Upstream Snake River segment	RM 409 to 335	2,735
Burnt River	RM 327.5: Brownlee Reservoir Segment	21
Powder River	RM 296: Brownlee Reservoir Segment	33
Total Brownlee Reservoir segment	RM 335 to 285	2,789
Total Oxbow Reservoir segment	RM 285 to 272.5	2,798

Response: Table 4.0.7 has been modified to include only the loading capacities as follows:

Table 4.0.7. Total phosphorus allocable load for segments in the Snake River - Hells Canyon TMDL reach based on the water column target concentration of 0.07 mg/L and calculated average flows (May through September).

Segment	Location	Load (kg/day)
Total Upstream Snake River segment	RM 409 to 335	2,735
Total Brownlee Reservoir segment *	RM 335 to 285	2,829
Total Oxbow Reservoir segment **	RM 285 to 272.5	2,839

*equal to the measured inputs of the upstream Snake River plus the Powder and Burnt Rivers, plus the estimated inputs of unmeasured tributaries (such as Brownlee Creek). Loads from unmeasured tributaries were estimated at 80 kg/day (approximately 2x the loading assessed for the Weiser Flat tributaries that discharge into the Snake immediately upstream of Brownlee Reservoir, most is projected to be delivered in the spring and summer seasons).

** equal to the measured inputs of Brownlee Reservoir, plus the estimated inputs of unmeasured tributaries (such as Wild Horse River). Loads from unmeasured tributaries were estimated at 20 kg/day (approximately 50% the loading assessed for the Weiser Flat tributaries that discharge into the Snake immediately upstream of Brownlee Reservoir, most is projected to be delivered in the spring and summer seasons). Load allocations to unmeasured tributaries were calculated at 50% reduction from estimated loads due to high probability for high natural loading.

Issue #2: Table 4.0.9 establishes load allocations for tributaries and other known nonpoint sources of total phosphorus. The sum of the load allocations plus the waste load allocations should not exceed the loading capacity. It appears, however, that the sum of the waste load allocations and load allocations exceeds the loading capacity in the Upstream Snake River. Table 4.0.9, as submitted to EPA, is below:

Table 4.0.9. Calculated total phosphorus load allocations for tributary and nonpoint sources to the Snake River - Hells Canyon TMDL reach based on calculated average flows (May through September).

Segment	Load Allocation (kg/day)	Percent Reduction
Snake River Inflow	1,461	24
Owyhee River	75	72
Boise River	256	77
Malheur River	61	87
Payette River	497	30
Weiser River	144	63
Drains	96	85
Ungaged flows	145	62
Total Upstream Snake River Segment	2,590	54
Burnt River	21	60
Powder River	33	74
Total Brownlee Reservoir Segment*	2,773	*
Total Oxbow Reservoir Segment	2,798	

* A dissolved oxygen load allocation has been established for this segment.

Response: The revised table (Table 4.0.9) addresses this concern. Wasteload allocations were not adjusted. Instead, consistent with the approach agreed to by the Snake River/Hells Canyon TMDL Public Advisory Team (PAT), load allocations were reduced so that the sum of the waste load allocations and the load allocations were equal to the loading capacity. Load allocations were reduced in a proportional fashion by a total of 153 kg/day.

Table 4.0.9. Calculated total phosphorus load allocations for tributary, point and nonpoint sources to the Snake River - Hells Canyon TMDL reach based on calculated average flows (May through September).

Segment	Load Allocation (kg/day)	Percent Reduction
Snake River Inflow	1,379	28
Owyhee River	71	73
Boise River	242	78
Malheur River	58	88
Payette River	469	34
Weiser River	136	65
Drains	91	86
Ungaged flows	137	64
Total Upstream Snake River Load Allocations	2582	54
Total Upstream Snake River Waste Load Allocations	153	
Total Upstream Snake River Segment Load and Waste Load Allocations	2,735	
Burnt River	21	60
Powder River	33	74
Unmeasured Tributaries to Brownlee	40	50
Total Brownlee Reservoir Segment	2,829**	
Unmeasured Tributaries to Oxbow	10	50
Total Oxbow Reservoir Segment	2,839	

* Total allocable load for this segment is 2,735 kg/day (2,582 kg/day from nonpoint sources and 153 kg/day from point sources)

** Total allocable load, includes point source wasteload allocation from upstream sources. A dissolved oxygen load allocation has also been established for this segment.

Issue #3: Table 4.0.15b. The allocated loads for three segments and several tributaries exceed the current sediment loads. Because the Snake River is water quality limited for sediment, load allocations should not be allowed to exceed current loads. Table 4.0.15b, as submitted to EPA, is below:

Table 4.0.15 b. Total suspended solids (TSS) load allocations for nonpoint sources within the Snake River - Hells Canyon TMDL reach (RM 409 to 188).

Source	Location (RM)	Load Allocation (kg/day)
Snake River Inflow	RM 409: Upstream Snake River Segment	1,054,463
Owyhee River	RM 396.7: Upstream Snake River Segment	48,007
Boise River	RM 396.4: Upstream Snake River Segment	148,569
Malheur River	RM 368.5: Upstream Snake River Segment	4,2062
Payette River	RM 365.6: Upstream Snake River Segment	296,530
Weiser River	RM 351.6: Upstream Snake River Segment	121,144
Drains	Upstream Snake River segment (RM 409 to 335)	57,628
Ungaged flows	Upstream Snake River segment (RM 409 to 335)	118,178
Total Upstream Snake River Segment	RM 409 to 335	1,886,581
Burnt River	RM 296: Brownlee Reservoir Segment	9,713
Powder River	RM 327.5: Brownlee Reservoir Segment	26,348
Total Brownlee Reservoir Segment	RM 335 to 285	1,888,952
Total Oxbow Reservoir Segment	RM 285 to 272.5	1,904,434

Response: Please see revised Table 4.0.15 b below. This table has been adjusted by allocating loads either based upon current loads or those load allocations necessary to meet the target concentrations. Three additional columns to the table have been added to show current loads and the percent reduction necessary to achieve load allocations. The third column indicates the calculated loading capacity which was previously described as an allocation.

There is not a load allocation for Brownlee Reservoir; instead, the table shows the loading capacity. The value in the table is a threshold value based on current loading minus the required load reductions identified for inflowing waters. The threshold has been identified to be protective of existing water quality. The same reasoning was used to derive the Oxbow Reservoir threshold value. Load allocation values cannot be calculated directly as there are not flow data available for most of the small tributaries entering the reservoirs and concentration data reflect deposition occurring in the reservoirs. Based on estimated flows and measured and interpolated concentration data, Oxbow Reservoir receives an estimated 15,482 kg/day sediment load (annual mean) from tributaries. Due to the additional flow and loading to Oxbow Reservoir, the threshold values for Brownlee and Oxbow Reservoirs should not be equal.

Table 4.0.15 b. Total suspended solids (TSS) load allocations (shown in bold type), sediment thresholds and percent reductions required for nonpoint sources within the Snake River - Hells Canyon TMDL reach (RM 409 to 188).

Source	Location (RM)	Calculated Load (kg/day)	Load Allocations ^a (kg/day)	Loading Capacity (kg/day)	% Reduction Required
Snake River Inflow	RM 409: Upstream Snake River Segment	677,785	677,785		0%
Owyhee River	RM 396.7: Upstream Snake River Segment	66,152	48,007		27%
Boise River	RM 396.4: Upstream Snake River Segment	130,466	130,466		0%
Malheur River	RM 368.5: Upstream Snake River Segment	92,870	42,062		55%
Payette River	RM 365.6: Upstream Snake River Segment	137,887	137,887		0%
Weiser River	RM 351.6: Upstream Snake River Segment	53,617	53,617		0%
Drains	Upstream Snake River segment (RM 409 to 335)	143,430	57,628		60%
Ungaged flows	Upstream Snake River segment (RM 409 to 335)	181,484	118,178		35%
Total Upstream Snake River Segment	RM 409 to 335	1,483,691		1,265,630	15% ^c
Burnt River	RM 296: Brownlee Reservoir Segment	13,274	9,713		27%
Powder River	RM 327.5: Brownlee Reservoir Segment	14,857	14,857		0%
Total Brownlee Reservoir Segment	RM 335 to 285	n/a ^b		1,290,200	
Total Oxbow Reservoir Segment	RM 285 to 272.5	n/a ^b		1,305,682	

^a Load allocations (shown in bold type) are based on calculated load capacities, less a 10% margin of safety. In those cases where measured sediment concentrations were not observed to exceed the target values, no reductions are required. However, in an effort to prevent further degradation within the SR-HC TMDL reach, threshold values have been established at the current sediment loads. These thresholds will be recognized in considering future management options, and will act to direct future decisions to those options that will not result in an increase in sediment loading from these tributaries to the SR-HC TMDL reach.

^b The sediment loading to these reaches cannot be accurately calculated due to the sink effect of the reservoirs. Thresholds have been determined using load capacity determinations and upstream loading calculations.

^c The % reduction listed is representative of the reduction in total loading to the identified segment as a result of required reductions in loading realized upstream.