
Dissolved Oxygen TMDL
Dispute Resolution
Hayden Area Regional Sewer Board, Idaho
• April 5, 2010

This presentation will:

- Join concerns raised by Coeur d'Alene
- Introduce HARSB
- Outline HARSB's concerns with the TMDL and needed changes
- Discuss phosphorus allocations
  - Other needed changes discussed in Post Falls presentation

Introduction to HARSB

- Four things to know about HARSB
  - Serves a substantial area
  - Serves growing communities
  - Has already done a lot to reduce nutrient loading
  - Is willing to do significantly more to reduce discharges

HARSB Service Area

HARSB Future Service Area
21,180 acres

HARSB serves growing communities

- Current capacity: 2.0 mgd
- Currently serves population of more than 16,000:
  - City of Hayden (11,500)
  - Hayden Lake Rec'l Water and Sewer District (4,800) and
  - Kootenai County Airport (325)
- 2030 projection:
  - service area population will double to 32,400
- 3.2 mgd needed to serve 2030 population
- Future service area population: 56,000

HARSB Already Does A Lot to Reduce Nutrient Loading

- Plant performs well: Better than 96% TSS and BOD removal (permit requires 85%).
- Includes advanced treatment processes:
  - Activated sludge
  - Secondary clarification
  - Chlorine disinfection
  - Biosolids composting and reuse (3rd party).
- Growing season water reuse farm largest in the Spokane River watershed.

HARSB Is Willing To Do More

- Master planning is underway for 2.4 mgd including
  - biological nutrient removal
  - nitrification/denitrification
  - phosphorus removal
  - tertiary filtration and
  - upgraded disinfection
- If TMDL makes it feasible, HARSB is willing to:
  - install and operate technology sufficient to reduce phosphorus levels to 50 ug/L on a seasonal average

HARSB's concerns with the TMDL

- Inadequate allocations
- Severe economic impact

TMDL Allocates Too Little to HARSB

- The TMDL allocates HARSB only 0.96 lbs/day phosphorus and ~18.8 lbs/day ammonia
- Stretches compliance season to March, and moves to monthly maximum from seasonal average, eliminating advantages of land application
- Allocation is only sufficient to serve a population of about 23,000

Part of the problem is the 36 ug/L treatment assumption

- As stated by Coeur d'Alene, treatment plants cannot achieve 36 ug/L phosphorus on a reliable basis
- Statistical analysis of variability shows that higher limits are required
- The lowest achievable level on a reliable basis is 50 ug/L on a seasonal average

Part of the problem is the monthly maximum

- TMDL eliminates the effective use of reuse during growing season by moving to monthly maximums
- This means HARSB will be unable to meet load limits outside of growing season (March, April, May and October are problematic)
- Effectively imposes growth cap on Idaho

TMDL would have severe economic impact

- TMDL's effective growth cap reduces 2027 GDP by **$3.5 billion** per year:

Figure 15. Potential Impact on the Kootenai County's Economy

Gross Regional Product

Kootenai County, ID	2010	2020	2030	2010-2030 Increase	2010-2030 Avg Anl
Projected GRP *(millions of $2004)*	$3,917	$5,429	$7,502	$3,584	4.6%
Projected Population	146,904	189,275	232,622	85,718	2.9%
Projected Jobs	83,382	104,277	130,342	46,960	2.8%
Total Population and Jobs	230,286	293,552	362,964	132,678	2.9%
GRP per Person and Job	$17,000	$18,500	$20,700		

Source: Woods & Poole Economics, Inc.

Kootenai County GRP *(in millions of 2004 dollars)*	2010	2020	2030	2010-2030 Increase	2010-2030 Avg Anl	Potential Economic Impact
WA Dept of Ecology Growth Cap	$3,917	$3,711	$3,930	$13	0.0%	($3,572)

TischlerBise, February 26, 2010 at 19.

HARSB'S needed Changes

- No concentration-based limits for Idaho permits;
- Increase in ammonia load to 107 lbs/day June thru September;
- Include load allocation for the Spokane River east of the Idaho border;
- Load sufficient to serve future population based on 50 ug/L phosphorus seasonal average:
  - 1.33 lbs/day seasonal average
- Clarify criteria and applicability of bio-availability studies to Idaho dischargers.

Phosphorus Allocations

- Inequities in current allocations
- Sources of additional allocations without harming the river, other dischargers or Avista

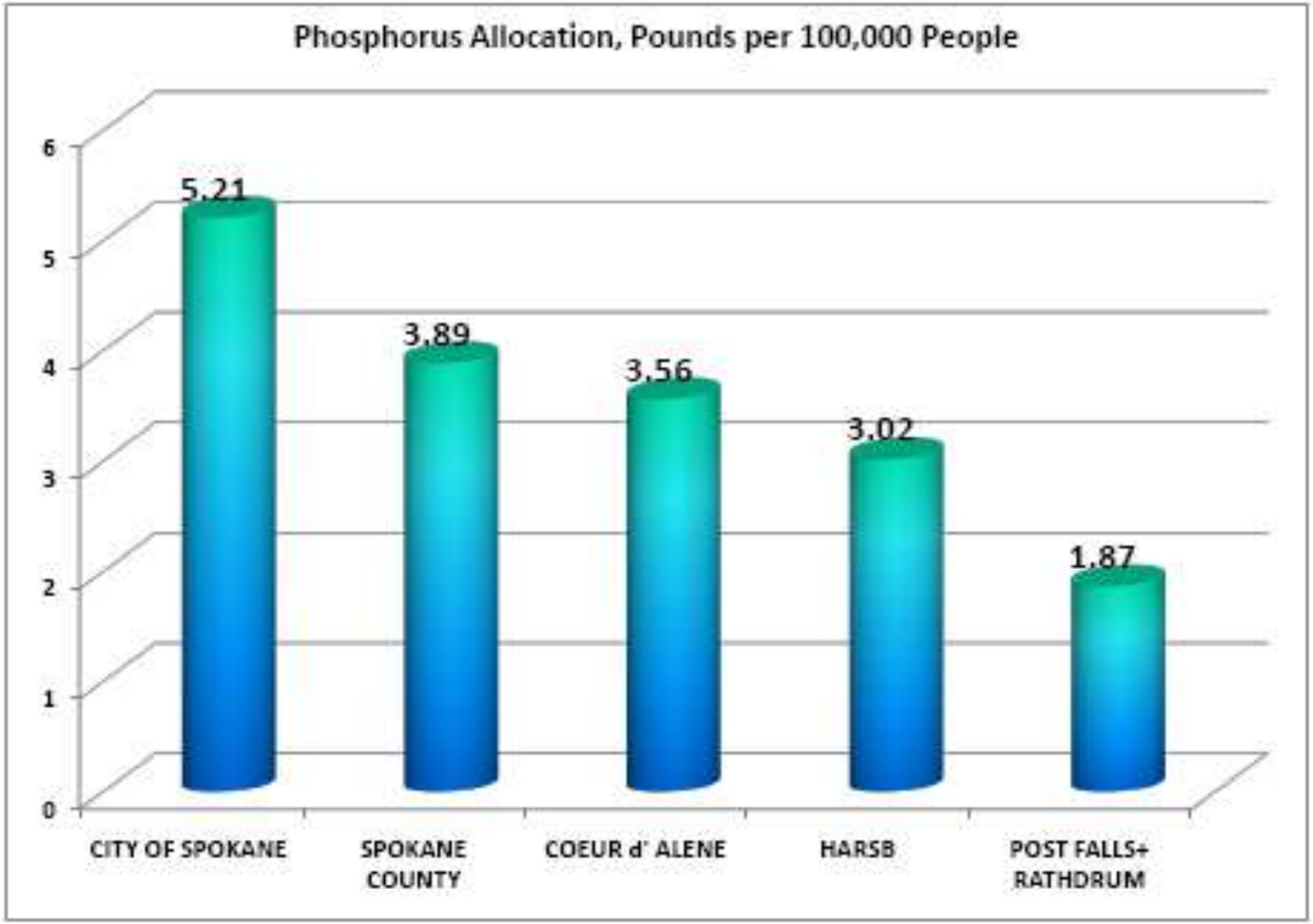
Current allocations are inequitable

- Overall allocations between Washington and Idaho are grossly disproportionate
- Allocations among municipal service providers are grossly disproportionate to expected population

Allocations Between Washington and Idaho Are Grossly Disproportionate

- Idaho has 65% of land mass in watershed
- Idaho provides 90% of the water to Lake Spokane
- Idaho will have 27% of 2027 population
- Idaho given 2.2% to 9.2% of load
- HARSB needs less than 1/2 add'l lb out of 78 in critical season

Month and season	Total human load (lbs/day)	Load allocated to Washington (lbs/day)	Washington percentage	Load allocated to Idaho (lbs/day)	Idaho percentage
March-May	329	321.8	97.8	7.2	2.2
June	119	111.8	93.9	7.2	6.1
July-October	78	70.8	90.8	7.2	9.2


Phosphorus Allocation, Pounds per 100,000 People
6
5
4
3
2
1
0
5.21
3.89
3.56
3.02
1.87
CITY OF SPOKANE
SPOKANE COUNTY
COEUR d' ALENE
HARSB
POST FALLS+ RATHDRUM

Sources of Additional Allocations for HARSB

- Attenuation/modeling errors
- Septic tanks
- City of Spokane re-allocation
- Delta management re-allocation
- Groundwater allocations
- Tributary allocations

Attenuation

- Spokane contributes 3.75 times the phosphorus concentration as Post Falls:

Comparison of Phosphorus Concentrations Delivered to Lake Spokane for Three Scenarios

Figure 1 shows that the Incremented Idaho scenario delivers essentially identical total phosphorus concentration to Lake Spokane as the TMDL scenario, while the Incremented Spokane scenario delivers noticeably higher concentrations. The information in Figure 1 is condensed into summer averages for each scenario in Table 1. The Incremented Idaho scenario increases average phosphorus concentrations over the TMDL by 0.0012 mg/l, while the Incremented Spokane scenario increases average phosphorus concentrations by 0.0045 ug/l. This indicates that equivalent increases in phosphorus loads from the two sources result in than 3.75 times more additional phosphorus being delivered from the City of Spokane than from Idaho sources.

LimnoTech, March 11, 2010 at 3 (Exh 14).

Attenuation (cont'd)

- And 3.1 times the chlorophyll-a:

Comparison of Chlorophyll Concentrations for Lake Segment 9

Figure 2 shows the Incremented Idaho scenario results in chlorophyll concentrations in Lake Spokane much more similar to the TMDL scenario than the Incremented Spokane scenario. The information in Figure 2 is condensed into summer averages for each scenario in Table 2. The Incremented Idaho scenario increases average chlorophyll concentrations by 0.269 ug/l over the TMDL, while the Incremented Spokane scenario increases average chlorophyll concentrations by 0.838 ug/l. This indicates that equivalent increases in phosphorus loads from the two sources result in more than 3.1 times more chlorophyll being generated from the increased City of Spokane load than from increased Idaho sources.

LimnoTech, March 11, 2010 at 4 (Exh 14).

Problems With Ecology's Attenuation Analysis

- Idaho introduces only 4% of phosphorus
- Idaho's impact only 15% of total under PSU modeling not 50% to 75%
- FERC-mandated flows not included
- Idaho DO modeling is unreliable
  - Why would 4% of phosphorus create 15% of DO impact?
  - Model is unstable

DO Model Instability

- The DO model shows unexpected flow variations, calling TMDL modeling into question:

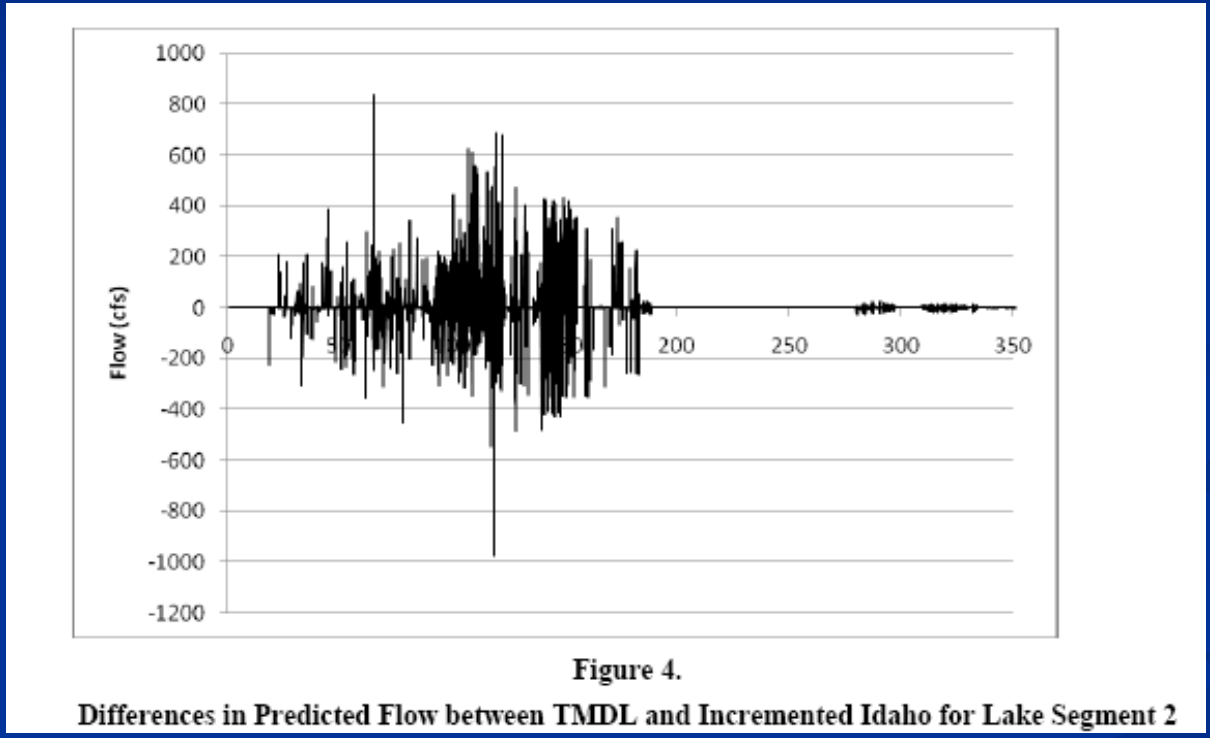


Figure 4.

Differences in Predicted Flow between TMDL and Incremented Idaho for Lake Segment 2

LimnoTech, March 11, 2010 at 6 (Exh. 14).

Attenuation (cont'd)

- Bottom line:
  - Something is probably wrong with modeling of Idaho DO impacts
  - Evidence of attenuation is overwhelming
  - Loads can be adjusted without affecting other dischargers
- Dave Dilks from LimnoTech can answer your questions

Septic Tank Re-allocation

- Septic tanks are illegal point source dischargers.
- It is unlawful to include loads for septic tanks in the TMDL.
- This applies both to Spokane County and Stevens County
- The septic tank loads should be estimated and removed from the TMDL.
- Spokane County should receive sufficient offset for operation.
- The remainder should be re-allocated.

City of Spokane Re-Allocation

- City of Spokane received an allocation disproportionate to future population:

Figure 9. Population Shift Due to Growth Cap

	2010	2020	2025	2027	2030
	Woods & Poole Economics				
Spokane Trends	475,973	544,063	578,975	593,016	614,077
Average Annual Growth	6,648	6,809	6,982	7,020	7,020
Spokane Share of Metro	76.4%	74.2%	73.3%	73.0%	72.5%
Kootenai Trends	146,904	189,275	210,874	219,573	232,622
Average Annual Growth	4,715	4,237	4,320	4,350	4,350
Kootenai Share of Metro	23.6%	25.8%	26.7%	27.0%	27.5%
	Washington Department of Ecology				
Spokane Phosphorous	483,771	589,243	641,978	663,073	694,714
Average Annual Growth	10,547	10,547	10,547	10,547	10,547
Spokane Share of Metro	77.7%	80.2%	81.2%	**81.6%**	82.1%
Kootenai Phosphorous	138,743	145,080	148,249	149,516	151,418
Average Annual Growth	634	634	634	634	634
Kootenai Share of Metro	22.3%	19.8%	18.8%	**18.4%**	17.9%

TischlerBise, February 26, 2010 at 12 (Exh. 5)

City of Spokane (cont'd)

- The City of Spokane received an allocation including 9.6 MGD of I/I:

> Currently, the SAWTP is processing an average of 40.7 million gallons per day (MGD) of regional sanitary sewer. This includes about 9.6 MGD that are associated with variable flow. Variable flow is water that infiltrates or inflows into the system and is not associated with sanitary sewer users. The city continues to make improvements to the SAWTP system to limit the amount of variable flow.

City of Spokane Cap. Fac. and Utilities Plan, Vol. 2 at 28 (highlighting added) (Exh. 7).

- LimnoTech analysis shows loads can be transferred without harming water quality

Delta management Re-allocation

- What Ecology told Idaho dischargers about achievability of limits:

available in Idaho and Ecology has made no such assumption. As stated in the summary response to Part R, Ecology and EPA believe that the loading assumptions for phosphorus, for the Idaho dischargers, in the draft TMDL are, in fact, achievable with available technology.

TMDL at C-38.

Delta Management (cont'd)

- What Ecology told Washington dischargers:

parties as described in the *Managed Implementation Plan* section. The dischargers and Avista can and will likely need to pursue actions to reduce nonpoint sources of pollution to the mainstem of the river and the tributaries, in order to reduce their "delta" and meet the wasteload allocation (Dischargers) and dissolved oxygen responsibility (Avista).

TMDL at 37.

Delta Management (cont'd)

- Bottom line:
  - TMDL acknowledges Idaho does not have delta management opportunities
  - It is not legal or right to ask Idaho service providers to pay Washington entities for things like septic tank elimination that have been Washington's obligations all along
  - Idaho loads should be adjusted to reflect achievable discharge levels

Adjust Ground Water Allocations

- TMDL assumes 25 ug/L phosphorus in ground water in lake watershed
- Results in anthropogenic load between 24 and 79 lbs/day
- Data weak and Ecology admits loads probably overestimated
- Additional data gathering underway
- Minor adjustment warranted

Adjust Tributary Loads

- Tributary allocations could be reduced:

Table 6 b. Total phosphorus load reductions.

Tributary	Month	Loads (lbs/day)			Load Reduction (lbs/day)	% Reduction	
		Natural (lbs/day)	2001 (lbs/day)	TMDL (lbs/day)		of 2001 Load (%)	of Human Load (%)
Little Spokane	Mar-May	35.9	139.9	102.5	37.4	27	36
	June	18.1	74.0	53.9	20.1	27	36
	Jul - Oct	16.2	41.1	32.2	9.0	22	36
Hangman	Mar-May	62.2	159.7	140.2	19.5	12	20
	June	3.9	9.9	7.5	2.4	24	40
	Jul - Oct	1.0	1.8	1.4	0.4	22	50
Coulee	Mar-May	8.1	20.8	18.2	2.5	12	20
	June	1.0	2.4	1.8	0.6	24	40
	Jul - Oct	0.3	0.5	0.4	0.1	22	50

Notes:
1- Human Load = 2001 – natural.

2-Equation 2: TMDL value = 2001 – [(2001-natural)(% reduction in human load)]

TMDL at 40.

Tributaries (cont'd)

- TMDL offers no support for amount of tributary reductions
- At least one point source (Spokane Fish Hatchery) is not accounted for
- Explore modification of loads and minor re-allocation

Conclusion

- HARSB is willing to
  - install tertiary treatment sufficient to meet 50 ug/L on seasonal average
- HARSB needs five modest changes to TMDL
  - No concentration limits
  - Increase in ammonia load to 107 lbs/day June thru September
  - Include load allocation for the Spokane River east of the Idaho border
  - Load sufficient to serve future population based on 50 ug/L phosphorus seasonal average:
    - 1.33 lbs/day
  - Clarify criteria and applicability of bio-availability studies to Idaho dischargers

Questions