

DEQ Nutrient Work Group 8th Meeting Summary May 20, 2010

Introductions

A list of the members of the Nutrient Work Group (NWG) and others in attendance is attached below as Appendix 1.

Agenda

- NWG Process Concerns
- Review of the March 15, 2010 Meeting Summary
- Continued Discussion of the Economic Impacts of Numeric Nutrient Standards
- DEQ Report to the Environmental Quality Council (EQC)
- Private Entity Temporary Affordability Criteria
- NWG Work Plan
- Public Comment
- Next Meeting

NWG Process Concerns

George Mathieus began the meeting by discussing concerns expressed to him regarding the NWG process. One concern is that DEQ is in a hurry to take a rule proposal to the Board of Environmental Review (BER) for adoption of base nutrient numeric criteria. Mr. Mathieus stated that he does not intend to take a rule proposal to the BER until it includes a package of nutrient numeric criteria, temporary nutrient criteria (i.e., variance concentrations), and steps for implementing the criteria. Another concern is that the NWG has spent too much time on the scientific and legal basis of the criteria. Mr. Mathieus stated that the group needed to spend time understanding what is being built, including the science and legal basis. He does not, however, want to spend additional NWG time addressing legal questions. If someone has additional legal questions, they should provide them to Mr. Mathieus and he will get answers from the DEQ legal council outside of the NWG meetings. The NWG has been and will continue to execute its work plan. A key area that will be addressed is how the new criteria will be translated into permits so that people can understand what they will mean to them. Specific examples will be considered at future meetings.

Gerald Mueller stated that the work plan topics that will remain after this meeting include: EPA view of the 1% median household income cap for the public entity temporary affordability criteria, the private entity temporary affordability criteria, the nutrient trading policy, and a DEQ proposal for revisions to the base numeric nutrient criteria.

Question - When will the proposed nutrient trading policy be issued?

Answer - Todd Teegarden is leading the effort to develop the draft policy for DEQ. DEQ has retained an outside expert to review the draft policy before it is released. The outside expert reviewed an initial draft and provided advice about what has worked in other states. DEQ then modified the draft. The department will be meeting next week with the expert to discuss the

modified version. The draft will be issued sometime after this meeting. This policy is a priority of the DEQ director.

Review of the March 15, 2010 Meeting Summary

NWG members present at this meeting had no comments on the March 15, 2010 meeting summary.

Continued Discussion of the Economic Impacts of Numeric Nutrient Standards

Dr. Jeff Blend continued the discussion of the economic impacts of numeric nutrient criteria began at the January 21, 2010 NWG meeting. He used a [PowerPoint](#) presentation entitled “Estimated Benefits and Costs of Compliance with Nutrient Criteria in Montana.” A copy of the presentation will be posted on the NWG web site at the following address.

<http://www.deq.mt.gov/wqinfo/NutrientWorkGroup/default.mcp>

The content of the presentation is included below in Appendix 2.

Question - Are there studies of the cost and benefits of numeric nutrient standards other than the Dodds study?

Answer - I am aware of other studies of improved water quality but not of nutrients alone.

Question - You list commercial fishing/fishing guides under non-quantified benefits. Why didn't you quantify these benefits?

Answer - While some studies may tie quantified benefits of improved water quality to this category, they do not address nutrient water quality alone.

Comment - By not quantifying the benefits you cite, you effectively set them at zero, the number that we know is wrong.

Response - While I agree that the benefits are not zero for the non-quantified benefits, including environmental benefits, I don't have sufficient information to quantify them.

Question - Why did you choose not to quantify benefits to the fishery?

Answer - Again, I do not have sufficient information about the benefits of the nutrient criteria to quantify their benefits to the fishery.

Question - You compared the annual cost of complying with the proposed numeric nutrient criteria per affected person, \$47, with the value Dr. Duffield calculated for the value of resident fishing per day, \$52. Why did you pick this value for comparison? Why didn't you pick the annual cost of cigarettes per person per year?

Answer - I could have picked other numbers for comparison such as the cost of cable television. I was merely trying to provide context for the cost-benefit calculation. I chose a water related value. For towns closer to the affordability limit, costs would be lower.

Question - Do the costs for municipalities include both capital and operating costs for nutrient criteria compliance?

Answer - Yes. I included both capital and operating costs over the twenty year amortization period for municipal nutrient criteria compliance.

Question - What affordability cap did you use, 1% or 2% of median household income?

Question - What affordability cap did you use, 1% or 2% of median household income?

Answer - I used two different values depending on the percentage that discharge would represent of the receiving stream at low flow. I used 1% for discharges whose discharge represents more than 50% of the low stream flow, and 1.5% for streams with a lower percentage. Thus, communities discharging into streams with lower dilution capability were capped at 1%.

Question - How many Montana communities have a low median household income?

Answer by Dr. Mike Suplee - We presented information about median household income and Montana communities at an earlier meeting of this group. For large communities, the total pollution control costs to meet nutrient criteria per household averages 0.5% of the community median household income (MHI). For average size communities, this value would average 0.8%. For smaller communities this value is 1 – 1.5%.

Comment - The preceding values correspond to Treasure State Endowment Program requirements.

Question - When calculating the cost of waste water treatment, did you subtract grant amounts?

Answer - Yes, I did so per EPA guidance for temporary affordability criteria.

Question - Do the 135 communities that you expect will require treatment upgrades to meet the numeric nutrient criteria have surface water discharge permits?

Answer - Yes.

Question - Do the other 65 communities have no discharge to surface waters?

Answer - They do not discharge to surface water because they use land application of their effluent, discharge it to ground water, or evaporate it.

Question - The Dodd's study uses national data. Does EPA have guidance that affects the benefit of nutrient criteria by eco-region?

Answer - No, EPA does not. In the Dodd's study, the cost data were not derived by looking at what it would cost to meet specific nutrient criteria levels. Rather, Dodd's looked at the cost to society resulting from eutrophication.

Comment - DEQ would apply the numeric nutrient criteria only to point sources. The cost and benefits of the criteria would not be related linearly to the criteria levels because of non-point sources.

Response - Non-point sources do contribute to water quality problems; however, in some instances, point sources can be the largest contributor to the problems.

Comment - Non-point sources are real. Examples include runoff from roads, agricultural activities, and septic tanks.

Response - We agree that non-point sources can contribute to nutrient water quality problems.

Comment - The benefits of the nutrient criteria need to be prorated for non-point contributions to water quality problems.

Response - The criteria would apply during the low flow period from the end of June through the beginning of October. In some cases, non-point sources are significant; in some they are not.

Question - Am I correct that you did not quantify private sector costs of complying with the numeric nutrient criteria?

Answer - Yes.

Question - Is the \$52 fishing value in 2010 dollars?

Answer - Yes, I modified Dr. Duffield's results to current dollars.

Comment - I acknowledge that people value clear streams. The issue, however, is the incremental costs and incremental benefits. Dr. Duffield's study assigning a value to fishing was conducted in the 1980s. Today's streams are clearer than the 1980s. Dr. Duffield's \$52 value of MT resident fishing related to the 1980s stream condition.

Response - Willingness to pay studies are controversial. We did not use Dr. Duffield's numbers in developing the costs and benefits of the nutrient criteria. The Dodd's work that we did use related water quality with costs.

Comment - In our region, both Utah and Colorado are also developing numeric nutrient criteria. In their cost/benefit analysis, they are considering the human health consequences of disinfectants. A benefit of nutrient criteria would be the reduced need for disinfectants.

Response - Controlling nutrients may result in different treatment technologies to protect drinking water.

Comment - Human health is protected by the Drinking Water Act. Disinfectants do react with organics and the reaction products may result in health issues. However, the increment is small.

Response by Tina Laidlaw - People responsible for drinking water quality in Colorado do not agree that the increment is small. I would be happy to arrange for relevant folks in Colorado to discuss this with the NWG.

Comment - I have not seen EPA address nutrient criteria as a human health issue. EPA addresses nutrient criteria as an environmental protection issue.

Response by Tina Laidlaw - The criteria must protect the most sensitive water use. Disinfection reactions may be important.

Question - What percentage of drinking water supplies are from surface water, and how clean are these sources?

Answer - I don't have this information now.

Answer by Ron Steg - In Montana, on the order of 70 communities draw drinking water from surface water.

Comment - This issue is complicated. We would have to consider what nutrient levels contribute to algae growth that in turn reacts with drinking water disinfectants.

Comment - The nutrient criteria should take this into account.

Comment - An issue of human health would be different than the recreation and aquatic life basis we have discussed for nutrient criteria.

Comment - Human health is protected by the Drinking Water Act.

Response by Jenny Chambers - There may be a compliance schedule for drinking water during which nutrient criteria would have a measurable cost reduction benefit.

Comment by George Mathieus - We will have DEQ drinking water people look into this disinfection issue and report back to this group.

Question - How did Dobbs arrive at the value of the endangered species benefit?

Answer - He set the value at 25% of the nationwide cost of endangered aquatic species recovery.

DEQ Report to the Environmental Quality Council (EQC)

George Mathieus stated that 75-5-313(c) and (d) has the following reporting requirements:

(c) On or before July 1 of each year, the department, in consultation with the nutrient work group, shall report to the environmental quality council by providing a summary of the status of the base numeric nutrient standards, temporary nutrient criteria, and implementation of those criteria, including estimated economic impacts.

(d) On or before September 1 of each year preceding the convening of a regular session of the legislature, the department, in consultation with the nutrient work group, shall summarize the previous two reports provided in subsection (4)(c) to the environmental quality council in accordance with 5-11-210. After consulting with staff of the Environmental Quality Council (EQC), DEQ will present a written report to EQC by July 1, 2010 and an oral report at the July 22-23 meeting. DEQ intends to prepare a draft report and circulate it to the NWG prior to its June 17 meeting so that the draft report can be discussed at the meeting. The draft report will describe the membership and work of the NWG, the status of the numeric nutrient and temporary affordability criteria, and the economic impact of the proposed standards.

Comment - The report should summarize the concerns of the NWG members.

Response - We will do so.

Question - Can we email our concerns to you in a bullet point format?

Answer - Yes. Please email them to me at gmathieus@mt.gov. I will respond to your email so that you know I have received it.

NWG Action - Those members of the NWG present at this meeting agreed to email their concerns for inclusion in the DEQ report to the EQC by close of business on Friday, May 28.

Question - Will Dr. Blend's work be presented at the July EQC meeting?

Answer - A summary will be included. We will likely not have sufficient time to present it in detail.

Comment - DEQ should give the EQC a sense of its assessment of the overall costs and benefits of the nutrient criteria, perhaps by using the key headings from Dr. Blend's PowerPoint presentation today.

Comment - The report should specify what costs and benefits are quantifiable and which are not.

Question - Would it be possible to specify the costs in terms of dollars per pound of nitrogen or phosphorus to address the incremental costs and benefits of nutrient criteria?

Answer by Don Quander - Terry McLaughlin struggled with this but was unable to do so because of site specific considerations.

Comment - For at least some of Montana's industrial plants, non-compliance with water quality standards is not acceptable. The prospect of a variance is not enough. They prefer achievable cost effective incremental standards that improve nutrient water quality.

Response - We will be presenting a package of base numeric nutrient and temporary nutrient criteria and implementing actions in our rule proposal. We expect to focus on examples of how the criteria will be addressed in permits so that NWG members can understand how they would be affected by the criteria.

Private Entity Temporary Affordability Criteria

Because DEQ could not keep economic data such as profitability proprietary, it does not believe the approach to temporary affordability criteria in the EPA guidance would be feasible. Instead, DEQ proposes an approach similar to effluent limit guidelines (ELGs) which would specify economically feasible best available control technologies (BACT) for treating nutrients for categories of industries. We believe this approach is consistent with the mandate of 75-5-313 MCA. We intend to discuss the sideboards of this approach with EPA. Mr. Mathieus asked for NWG concurrence with this approach.

Question - Why not adopt this approach as the standard rather than the variance?

Answer by Dr. Suplee - We believe the statute provides this approach for the temporary criteria rather than the numerical nutrient criteria. The BACT would provide the pathway for a 20-year variance leading towards compliance with the permanent nutrient criteria.

Question - Has EPA provided any additional guidance for the private entity affordability criteria?

Answer by Tina Laidlaw - No.

Comment - This approach is analogous to what EPA has approved for mercury in the Great Lakes region. The states of Wisconsin, Ohio, and Indiana have set treatment-based levels in permits driven by detection limits.

Response by Tina Laidlaw - EPA has not accepted multiple discharger variances for nutrients as it has for mercury.

Comment - This is an interesting approach that I will take back to the industries I represent. It appears to merit additional discussion. I assume that DEQ would also offer case-by-case temporary affordability criteria if an industry would choose to provide specific information demonstrating that the categorical BACT level would not be appropriate.

Response - We would allow the option of the case-by-case option with the industry bearing the burden of providing the information necessary to use it. The pulp and paper sector in Wisconsin followed this approach.

Question - Is sufficient information available for DEQ to use this BACT approach for industrial categories in Montana?

Answer - Yes, we think so. We would likely rely on information from national ELGs and from the industries present here.

Question - How long would DEQ need to develop the category BACTs?

Answer by Jenny Chambers - I estimate six to eight months.

Question - Does this mean that DEQ will not present a rule proposal to the BER until the category BACTs are developed?

Answer - Yes. We will keep moving towards the package of criteria and implementation steps.

NWG Work Plan

Gerald Mueller stated that outstanding work plan topics include: DEQ's revisions to the numeric nutrient standard levels, EPA's response to the 1% median household income cap for the public entity affordability variance, a private entity affordability variance, and the nutrient trading policy.

Public Comment

There were no additional public comments.

Next Meetings

The NWG schedule includes meetings on June 17, August 12, and September 16. These meetings will be held in the DEQ Director's Conference Room in the Metcalf Building in Helena. The June agenda may include:

- The draft EQC report;
- EPA's view of the 1% MHI affordability cap;
- Continued discussion of the BACT approach to the private sector temporary affordability criteria;
- The disinfection and nutrient level issue; and
- DEQ's proposed revision to the base numeric nutrient criteria.

Appendix 1
NWG Attendance List
May 20, 2010

Members

Dick Hoehne	Town of Philipsburg/Montana League of Cities and Towns
John Wilson	City of Whitefish/Montana League of Cities and Towns
Jim Edgcomb	Montana Department of Commerce
John Rundquist	City of Helena
Michael Perrodin	BNSF Railway
Donald Quander	Holland & Hart/Missoula Petroleum Association
John Youngberg	Montana Farm Bureau/agriculture
Brian Sugden	Plum Creek
Don Allen	Western Environmental Trade Association (WETA)
Jeff Tiberi	Conservation Districts
Chris Brick	Clark Fork Coalition
Jim Jensen	Montana Environmental Information Center
Debbie Shea	Montana Mining Association
Scott Murphy	Morrison-Maierly, Inc. (via telephone)
Ryan Swinney	Bruce Swinney & Associates (via telephone)

Alternate Members

Doug Parker	Hydrometrics (alternate for Debbie Shea)
-------------	--

Non-Voting Members

Dr. Mike Suplee	DEQ, Water Quality Standards Section, Water Quality Specialist
Dr. Jeff Bland	DEQ Economist

Other Meeting Participants

Dave Galt	Montana Petroleum Association
Mark Simonich	Helena Association of Realtors
Judel Buls	AE2S, Inc.
Vern Heisler	City of Billings
Alan Towerton	City of Billings
Mike Jacobson	City of Great Falls
Jenny Chambers	DEQ Water Protection Bureau Chief
Claudia Massman	DEQ Attorney
Kristi Kline	Montana Rural Water Systems, INC
Ray Armstrong	DOWL HKM
Jessie Luther	Browning, Kaleczyc, Berry, and Hoven
Ron Nissen	CHS Laurel Refinery
Ron Steg	EPA
Tina Laidlaw	EPA
Amanda McInnis	HDR
George Mathieus	DEQ Planning, Prevention and Assistance Division

NWG Facilitator

Appendix 2
Estimated Benefits and Costs of Compliance with Nutrient Criteria in Montana
Jeff Blend
Montana Department of Environmental Quality
May 20, 2010

- Estimated benefits and costs of compliance with nutrient criteria by major entities affected in Montana
- It is assumed in this analysis that nutrient criteria are not always reached
 - Affordability Limits
 - LOT
- If nutrient criteria were reached, in all cases, today, costs and benefits would be greater than the results of this analysis

Benefits (annual)	Costs (annual)
<u>Quantified</u>	
est. \$15.8 million (Dodds et al.)—recreation, drinking water, property values, endangered species	est. > \$40 million Public sector WWTP upgrades (using DEQ assumptions)
<u>Not Quantified</u>	
+ Other economic benefits (agriculture, health, water supply, aesthetics)	+ Private sector costs (30-40 businesses)
+ Ecosystem benefits and Non-Use values	+ Other costs (admin, transaction)
Long-term	At least 20 years

Benefits-Quantified

- Dodds et al.- "Eutrophication of U.S. Freshwaters: Analysis of Potential Economic Damages" (2008)
- Estimates the economic benefits of higher water quality as result of nutrient standards over current water quality, for the entire U.S.
- Methods:
 - Compares current TN and TP concentrations for the U.S. EPA nutrient ecoregions with estimated reference conditions.
 - Calculates potential annual benefit losses in recreational water usage, waterfront real estate values, threatened and endangered species, and drinking water from published data

Impacts to Benefits Estimated in Dodds et al. (2008)

- Recreational Water Usage — Algal bloom effects on boating, fishing, other rec.; loss of trip-related expenses from lake closure due to eutrophication
- Lakeside Property Value — Decrease with declines in water clarity--Calculates percent gain or loss in property values per 1 m change in Secchi depth.
- Biodiversity — Assumes 25% of all imperiled aquatic species are threatened in part by human-induced eutrophication and, therefore, 25% of all recovery costs of U.S. Federal Endangered Species Act plans are used as a proxy for this item
- Drinking Water Costs — Costs attributable to eutrophication. Estimated via \$ spent on bottled water due to avoiding taste and odor problems in surface-water derived tap water
- Dodds et al. (2008) estimate a benefit of \$2.2 B annually (all U.S.) resulting from meeting nutrient criteria. So...
- DEQ proportioned 2.2 B by MT population (0.31%) and/or land area (4%) to estimate Montana benefits - about \$15.8 M annually
- \$15.8 M per year is our best estimate
- \$15.8 M breaks out as:
 - Recreational usage (\$10.4 M)
 - Waterfront property values (\$1 M)
 - Endangered species (\$1.8 M)
 - Drinking water (\$2.6 M)

Population vs. Land Area To Generate Estimates

- Montana's population percentage is a better measure for some components of quantifiable nutrient benefits (e.g. drinking water), while land area percentage is a better measure for other components (e.g., endangered species).
- Both approaches used, as appropriate:
 - Recreational Usage: Used both
 - Property Values: Population
 - Endangered Species: Land Area
 - Drinking Water: Population

Benefit estimates, other studies

- Four studies show increase in property value per foot of lake frontage for measureable improvement in water clarity (from \$3.24 to \$39 in \$2010).
- Other quantitative studies on recreational benefits.
 - Value of improvement per trip from better dissolved oxygen levels—Smith and Desvougues, 1986 (\$0.10 to \$10.23 for change in DO of 1% per trip in \$2010)

Non Quantified Benefits

- Improved water quality for economic uses: Less treatment cost for a business, industry, or water supply (e.g. Miles City)
- Removal of overabundant macrophytes (non-Montana issue)
- Improved ag water supply (less clogging of irrigation canals)
- Livestock and pet deaths and sicknesses
- Commercial fishing/Fishing guides
- Number and magnitude of fish kills
- \$\$ spent on watershed restoration
- Option Value (possible future use) and Existence value

Benefits to the Environment

- Improved health of plants, wildlife, riparian areas, water and nutrient cycles
- Maintenance of dissolved oxygen levels suitable for aquatic life and fish
- Minimization of daily pH changes which can harm aquatic life and fish
- Maintenance of healthy aquatic life communities including more sensitive species (fish kills down, biodiversity up)

Costs of Nutrient Standard Compliance

- Costs fall to different entities:
 - Public sector (WWTPs)
 - Private sector (30-40 larger businesses)
 - Government costs
 - Other costs
- Public sector was the only sector that we could specifically quantify

Costs—Quantified: Public Sector

- Public WWTPs have to upgrade to meet nutrient standards-about 135 out of 200 total
- Most towns will hit limits of affordability. In a few cases, larger cities will hit limits of technology (LOT).
- Difference between current sewer rates and affordability limit (assume 1% or 1.5% of MHI) for WWTPs is the public cost of nutrient compliance; paid for by sewer rate payers over avg. 20 years
- 135 total towns for a total estimate of \$39.8 million more, in annual costs, than they face now

Non-Quantified Costs

- Total private sector costs unknown, but about 30-40 companies expected to be affected by required upgrades
- Each company is unique, and costs to each are currently unknown
- DEQ working through private-sector cost issue via NWG

Other Costs

- Administration costs
- Non monetary—Opportunity costs
- Costs to WWTPs could be less if alternatives are found (such as land application) or if water quality trading opportunities exist in the watershed

How High Are These Costs?

- \$40 M - \$15.8 M = \$24 M in net annual costs for Montanans. This means:
 - \$47 per affected person per year for nutrient compliance (just over half of Montanans affected) or \$4 per month per affect person.
- We can use other numbers/studies for comparison:
 - FWP fishing license data and annual angler spending in MT
 - John Duffield’s (U of M) literature survey of studies of willingness to pay for better water quality in MT. Includes three studies addressing Clark Fork Basin using original survey data.

\$47 per year cost per affected person, or \$24 M per year total net cost compared to:

- Value of MT resident fishing- \$52 *per day*
- Total spent for fishing licenses in FY09 in Montana by residents: about \$2.5 million, and by non-residents, about \$4.3 million (Sue Daly, MT FWP)
- Anglers spend approximately \$240 million per year (\$2010) in Montana (Duffield, Loomis, and Brooks, 1987).
- Marginal value of trips that would be substituted from nearby sites at around \$24 (\$2010) per trip (i.e., per day) for better overall water quality on the Clark Fork River
- Average yearly benefit per visitor of improving a lake’s DO level and shifting designated use from boatable to swimmable is nearly \$90 (\$2008) Desvousges (1986)—site specific across U.S.

Benefits (annual)	Costs (annual)
<u>Quantified</u>	
est. \$15.8 million (Dodds et al.)—recreation, drinking water, property values, endangered species	est. > \$40 million Public sector WWTP upgrades (using DEQ assumptions)
<u>Not Quantified</u>	
+ Other economic benefits (agriculture, health, water supply, aesthetics)	+ Private sector costs (30-40 businesses)
+ Ecosystem benefits and Non-Use values	+ Other costs (admin, transaction)
Long-term	At least 20 years

Distributional Impacts

- Benefits are for all Montanans, especially for those who recreate on or live near water, or those businesses and municipalities which rely on clean water
- Benefits to out-of-state tourists or those who live downriver from Montana
- Costs mostly to 135 towns (just over 50% of Montanans) and 30-40 businesses

Conclusions

- Quantifiable monetary costs of meeting nutrient standards are greater than monetary benefits
 - Net costs per person appear reasonable
- Overall benefits and costs are approximations-Lack of data problem
- A variety of ecosystem and non-monetary benefits are hard to quantify, as are business costs