

# DEQ Nutrient Work Group 16th Meeting Summary February 27, 2012

## Introductions

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

## Agenda

- Review of the December 15, 2011 Meeting Summary
- Overview of DEQ Non-Point Source Actions
- Status of Private Sector Statewide Substantial and Widespread Economic Impact Demonstration
- EPA's January 2, 2012 Tentative Approval Letter
- Revised Values for the Numeric Nutrient Criteria
- Brief Summary of Peer-Review Comments on the Model and Criteria for the Lower Yellowstone River
- Specification of the Nutrient Standards in Concentration and Mass
- Addressing N and P Separately in Nutrient Discharge Permits and Variances
- Rule Adoption Schedule
- NWG Work Plan
- Public Comment
- Next Meeting

## Review of the December 15, 2011 Meeting Summary

NWG members present at this meeting had no comments on the December 15 meeting summary.

## Overview of DEQ Non-Point Source Actions

Mark Bostrom provided the overview using a PowerPoint presentation entitled "[N&P and the 800 lb Gorilla](#)." This presentation is available at the following web address.

<http://www.deq.mt.gov/wqinfo/nutrientworkgroup/AgendasMeetingsPresentations.mcp>

*Question - What is the status of the trading policy?*

Answer - We expect the final rule making for the trading policy in June.

*Question - What is the amount of the current funding for the 319 Program?*

Answer - The current budget amount is \$2.1 million, and is used to fund DEQ TMDL staff and on-the-ground projects. Of this amount, \$1 million is allocated for projects.

*Question - What is the source of the 319 funds?*

Answer - The 319 Program funded by the federal government, but is administered by DEQ.

*Question - You said that the program is severely underfunded. Is situation subject to change?*

Answer - Yes, the funding is dropping.

*Question - Do you expect more funding to be used for projects and less for TMDL staff?*

Answer - Historically, we used this funding to build the TMDL staff, for non-point education and outreach and for surface and ground water projects. We expect going forward that at least half of the funds will be used for projects. Education and outreach spending will be curtailed.

*Question - A table in the Power Point presentation lists the nitrogen (N) & phosphorus (P) reduction estimates by year. What is the comparable dollars per N & P reductions for point and non-point programs?*

Answer - I don't have numbers to compare point and non-point program effectiveness. For 2011 for an expenditure of \$1 million, we estimate that non-point programs reduced N by 3.2 tons and phosphorus by 1.4 tons.

*Question - What happened in 2004 and 2005 to produce the large N & P reductions?*

Answer - In these years, funded projects included significant work on stabilizing stream banks which both reduced sedimentation and N & P discharges.

*Question - Are the N & P reduction estimates in the table based on field monitoring?*

Answer - Yes. 319 grants require monitoring.

*Question - Is there coordination between the Environmental Quality Incentives Program (EQIP) and 319 Program?*

Answer - In the past, the Natural Resources Conservation Service (NRCS), the federal agency that administers EQIP, has targeted watersheds for water quality related activities without input from DEQ. Richard Opper will meet with the Montana NRCS director seeking to coordinate EQIP and 319 Program activities. DEQ has been building partnerships with federal agencies for years. Good projects are often funded through several entities.

*Question - What is the relative funding amount for EQIP and the 319 Program?*

Answer - EQIP funding is about ten times larger than the 319 Program.

*Question - Do you expect funding for EQIP to decline?*

Answer - I don't know.

*Comment - NRCS recently issued a request-for-proposals for watershed groups to develop nutrient trading programs under EQIP. Nationwide, \$10 million was available for this purpose. Funding may be available for this purpose next year.*

Response - About half of these funds were allocated to Chesapeake Bay states and half to the other 42 states. Even if all of the non-Chesapeake funds were allocated to Montana, DEQ would still need approval of an additional full-time-equivalent (FTE) from the legislature to use the funds.

*Question - Could you couple nutrient trading with the 319 Program?*

Answer - Maybe. 319 funds are used for TMDL implementation. I have a problem using 319 funds for private projects. Trading is a bottom line issue for DEQ. Having developed a trading policy, we are hoping that it will be implemented through the market. DEQ does not have the staff to act as a nutrient trading bank.

*Question - Do you identify the primary contributor of nutrients?*

Answer - The TMDL program identifies a load allocation for a stream segment by land use but not by individual landowner. Load allocations are broader than waste load allocations.

*Question - Can 319 funds be used for federal matching requirements?*

Answer - Yes. We will think about using these funds in nutrient trading applications.

## **Status of Private Sector Statewide Substantial and Widespread Economic Impact Demonstration**

Dr. Jeff Blend reported on this topic. Unlike the public sector, DEQ was not able to rely much on the EPA guidance to assess the impact of implementing the numeric nutrient criteria on the private sector. The demonstration of significant and widespread impacts for the private sector was based on more of a descriptive argument than numerical metrics. Basically, the argument boiled down to applying the technology necessary to comply with the numeric nutrient criteria, reverse osmosis, and that it would be too expensive for Montana businesses. In the analysis, we looked at about 50 Montana businesses and estimated the cost of complying with the numeric nutrient criteria using US Census data for industrial sectors rather than data for individual plants and cost data from the Water Environment Research Foundation (WERF) study. We were surprised in our calculations at how high compliance costs would be. DEQ is formatting a paper with the private sector demonstration that will be provided to EPA. The paper should be posted on the NWG web page soon.

*Question - What does formatting mean?*

Answer - We are fitting data into tables for the appendices of the demonstration and making final edits.

## **EPA's January 2, 2012 Tentative Approval Letter**

George Mathieus reported on this topic. In late December of last year, Richard Opper wrote a letter to EPA Region 8 Director Jim Martin summarizing DEQ's activities aimed at developing numeric nutrient criteria and individual and general variances from them and asking if Montana's approach to variances would be consistent with the federal Clean Water Act. A copy of this December 29, 2011 letter is found at the following web address.

[http://www.deq.mt.gov/wqinfo/NutrientWorkGroup/PDFs/DEQltr2EPA12\\_29\\_11.pdf](http://www.deq.mt.gov/wqinfo/NutrientWorkGroup/PDFs/DEQltr2EPA12_29_11.pdf)

Regional Director Martin responded in a letter dated January 3, 2012. The letter concluded that, "After careful review of the above-reference analysis and assumptions offered by the State, the EPA concludes that the issuance of the variances would be consistent with the Clean Water Act and its implementing regulations." This letter is also available on the NWG web page at:

[http://www.deq.mt.gov/wqinfo/NutrientWorkGroup/PDFs/EPALtr1\\_3\\_12.pdf](http://www.deq.mt.gov/wqinfo/NutrientWorkGroup/PDFs/EPALtr1_3_12.pdf)

*Question - SB95 enacted by the 2009 legislature set the economic affordability threshold at 1% of Median Household Income. Now it appears that DEQ has moved to the sliding scale between 1 and 2%. Where is the affordability threshold?*

Answer - This threshold applies to the public sector individual variance, not the general variance. DEQ's goal has been finding away to get over the near term cost obstacle that complying with

the numeric nutrient criteria would present to Montana's public and private sector stakeholders. With the assistance of the NWG, we are developing the specifics of the variance. EPA has approved this approach with the understanding that the state is moving towards compliance with the numeric nutrient criteria over a 20-year period.

*Question - In 2016, when DEQ reviews the general variance, if the economics of standard compliance has not changed, would the current total N and total P levels of the general variance be continued?*

Answer - Possibly.

## **Revised Values for the Numeric Nutrient Criteria**

Dr. Suplee discussed three changes in the derivation of the numeric nutrient criteria from the 2008 analysis:

- Role of the reference concentration levels versus dose-response study results - In 2008, the criteria were driven as the 75<sup>th</sup> and 90<sup>th</sup> percentile of reference for each ecoregion. This was done because analysis showed that around the 85<sup>th</sup> percentile nutrient concentration of the reference sites, harm-to-use begins. The 85<sup>th</sup> percentile level is the value that exceeded 85% of the reference site concentrations. In the new analysis, dose-response values are the primary factor in setting the criteria levels. This change was made because more dose-response studies conducted in Montana or the similar ecoregions in the northwest are available than in 2008, and because limiting criteria derivation to just two percentiles (75<sup>th</sup> and 90<sup>th</sup>) led to cases where the criteria were (in retrospect) too strict or not sufficiently protective .
- Nitrates and nitrites versus total nitrogen (N) and total phosphorus (P) - The current analysis is based on total N and total P, and not values of nitrates and nitrites. Rapid uptake of soluble nitrogen compounds by aquatic organisms (mainly algae and plants) makes such compounds very difficult to use as surface water criteria. DEQ will request that nitrate and nitrite values continue to be monitored because doing so can help identify sources.
- Data contributions from reference sites - For 2008, all reference site data were used, perhaps introducing a statistical bias in the results in favor of sites with more data. In the present analysis, reference data were evened using an objective evenness index to remove this bias and ensure that all sites contribute equally to the whole.
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*Question - If one site had 48 samples, how are the results balanced?*

Answer - A random number process was used to select data used at a particular reference site.

*Question - Were all data collected using the same technique?*

Answer - Yes.

*Question - Were all of the reference site data collected over the same time period?*

Answer - No, data collection periods were longer at some sites leading to a larger number of samples. The smoothing reduces the effect of longer sampling periods. (Note: all data were, however, collected during the summer growing season.)

*Comment - The criteria for wadeable streams are seasonal, but those for lakes are not.*

*Particularly for lagoon systems, figuring out the impact on downstream lakes within the current permit and grant cycle is difficult*

Response -TMDLs are being developed for lakes such as Flathead Lake. If a source is near a lake, the nutrient criteria will likely be applied year-round rather than seasonally. We do not have a rule for determining what “near” is. Circular DEQ-12 requires that cases involving discharges to lakes be addressed on a case-by-case basis.

*Question - Can you give us any guidance about what is “near?”*

Answer - We do not have a formula. A distance from a discharge to a lake of 15 miles might be near, whereas 100 miles likely would not be.

*Question - How does DEQ conduct a lake analysis?*

Answer - We will have the TMDL come to the next NWG meeting and explain.

*Question - You mentioned that natural concentrations of total N are higher in the plains area. Do you look at the specific types of rocks in a given area?*

Answer - Yes. Geology is a key but not the sole driver. We are attempting to resolve the numeric nutrient criteria into Level IV ecoregions. We presently have data for 18 criteria zones (mix of level III and IV ecoregions). We may miss some Level IV areas because of a lack of reference data at that scale. Some areas such as Flint and Bozeman Creeks may have specific criteria because of local effects such as the influence of Georgetown Lake discharges on Flint Creek nutrient levels, or the effects of naturally-elevated phosphorus from a level IV ecoregion in the drainage.

*Question - When do you expect to have the criteria completed?*

Answer - In about a month.

*Question - In Florida, EPA’s proposed criteria were overturned by a court because they were not clearly related to the degree of harm. How does the current DEQ analysis address the degree of harm issue?*

Answer - For Florida, EPA relied on percentage of reference concentrations rather than dose-response studies, similar to our approach in 2008. Our analysis uses dose-response studies to relate criteria to degree of harm. For example, we can relate nutrient levels to algal and dissolved oxygen levels to assess harm to recreation and aquatic life. (Note: dose-response studies were a key component of the 2008 criteria in Montana as well, but there were fewer regional dose-response studies on which to rely at that time.)

*Comment by Tina Laidlaw - In Florida, EPA defaulted to reference percentiles because of a lack of dose-response data.*

## **Brief Summary of Peer-Review Comments on the Model and Criteria for the Lower Yellowstone River**

Dr. Suplee provided the summary. DEQ does not have reference watersheds for large rivers, i.e., watersheds with little human influence. The eight rivers listed in Table 1-1 of the lower Yellowstone report, cited below, are defined as large rivers. DEQ used a calibrated and validated steady state water quality model to assess harm the use for large rivers. The model allows calculations of dissolved oxygen, pH, algal growth, dissolved gas, and total organic carbon as a

function of nutrient levels. The report on the application of the model to the lower Yellowstone River is available on the NWG web site at the following address.

<http://www.deq.mt.gov/wqinfo/NutrientWorkGroup/PDFs/YellowstoneModel/WQPBDMSTECH-22-DRAFTBasicEquate.pdf>

The report was reviewed by two scientists. One reviewer liked the approach, and the other did not, preferring the empirical regression approach to models. DEQ is presently revising the report in response to comments by the reviewers and should have it finalized by the end of the summer. We should also have data collection for modeling completed this summer for the Yellowstone River between the Big Horn River and Livingston.

*Question - What other methodologies are available for developing nutrient criteria for large rivers?*

Answer - Another methodology would use a regression analysis of nutrient concentrations with algae levels.

*Question - Are both the modeling and regression methods data intensive?*

Answer - Yes.

### **Specification of the Nutrient Standards in Concentration and Mass**

Jenny Chambers responded to questions at the last NWG meeting concerning DEQ-12 permit about the possibility of specifying discharge permits in terms of average monthly limit based on mass loading rather than concentration. Ms. Chambers stated that she checked if a mass balance approach is legally defensible under the Clean Water Act and the Administrative Rules of Montana (ARM). Section 17.30.1345(8)(a)(ii) states:

All pollutant limited in permits must have limitations, standards, or prohibitions expressed in terms of mass except:

(ii) when the applicable standard and limitation are expressed in terms of other units of measurement.

8(b) continues:

Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit must require the permittee to comply with both limitations.

Based on these rules, Ms. Chambers concluded that permit may have both mass and concentration, but never just mass if the standard is expressed in concentration.

*Question - Once the numeric nutrient criteria are implemented, must the TMDL be specified as a concentration?*

Answer - TMDLs account for water quality criteria specified as concentrations and may set forth daily load limitations in pounds or concentration. Non-degradation requirements may also be in pounds. If no load limit is set for N or P in a TMDL, then the discharge cap may be in pounds and there would still be a concentration limit based on the criteria.

*Question - Can the permit categories be based on POTW discharge flow or service population?*

Answer - The basis for the general variance for POTWs or the private sector discharges to the numeric nutrient criteria is the design flow. If the variance categories change before or after the May 2016 date or before, then the variance would be based on the category established.

*Comment - The reasonable potential determination is based on the process for toxic substances. If we must look at concentrations, then permits will always set end-of-pipe limits. The Missoula and Butte-Silver Bow POTW permits do not set end-of-pipe limits.*

Response - Applying nutrient criteria in concentrations does not prevent use of mixing zones if the receiving stream has assimilative capacity, so that the permit need not be limited to end-of-pipe limits. Two factors will allow discharge variability under the discharge permit. The 14Q10 value, i.e., the lowest average 14 consecutive day low flow, occurring from July through October, with an average recurrence frequency of once in 10 years, is stretched to a 30-day average. Also, permit limits will be established using a value corresponding to the 95<sup>th</sup> percentile of the probability distribution of the effluent.

*Comment - Permits should reflect the fact that the purpose of numeric nutrient criteria is to protect a watershed.*

Response - Permit limits must be based on complying with the criteria at the end of mixing zone and are applicable to the receiving waterbody(s), not necessarily an entire watershed

*Comment - The Butte POTW permit currently has a discharge limitation specified in pounds rather than concentration. Butte-Silver Bow is planning to upgrade its treatment using both state-of-the art technology and a level of reuse. If the pound limit is converted to concentration then reuse will not be possible.*

Response - Permit limit is based upon the current Clark Fork TMDL. We will look at the Butte case in detail for the next NWG meeting.

*Comment - Treatment technology can't get there if the instream limit is specified as a end-of-pipe limit. We need more flexibility.*

*Comment - Specifying discharge limits in concentrations would negate the incentive to pursue nutrient trading.*

*Comment - POTWs plan for a 20-year period, but variances last only 5 years and the water quality criteria are reviewed on a 3-year cycle.*

Response - The target for the process including variances is to comply with the numeric nutrient criteria. Permits have the flexibility to specify a compliance schedule to move the discharger incrementally to the target level. Criteria and variance levels must be based on technology and economics so that new numbers will be realistically achievable.

*Comment - A small community may have used its taxing capacity for other infrastructure improvements and may not have the ability to meet the nutrient criteria.*

Response - The individual variance criteria includes existing debt for other community-level taxes and fees, bench marked to the state average.

*Question - Communities face adoption of numeric nutrient criteria and new metal water quality criteria. Funding agencies do not want to approve grants in the face of uncertainties because of incomplete projects. How can DEQ work with funding agencies and communities more effectively?*

Answer - Compliance schedules that take into account grant cycles are available for new permit requirements. DEQ will make meeting with engineers, communities, and grant agencies a priority to help permittees negotiate the permit process.

*Comment - Funding sources such as the Treasure State Endowment Program, State Revolving Fund, Community Development Block Grants, and DNRC programs have different funding priorities. The first three listed focus on public health whereas DNRC focuses on renewable resource development.*

### **Addressing N and P Separately in Nutrient Discharge Permits and Variances**

Dr. Suplee explained that section 2.0 of Part B of the most recent version DEQ-12 provides that a discharger may apply for a general variance for either the N or P criteria or both.

*Question - Can permits consider N and P separately?*

Answer - Yes. The general or individual variance may treat N and P separately.

*Question - The river assessment protocol determines whether N or P controls algal growth. How then do you separate N and P?*

Answer - N and P criteria are set for all ecoregions, although in some one or the other may control algal growth. Clark Fork River data support a co-limitation. Some sites met either the N or P criteria but did not meet the algae criteria. If appropriate, reach specific criteria may be established.

*Comment - If discharges are faced with end-of-pipe limitations, controlling P to the limit of technology and not controlling N may adequately protect water quality.*

Response - Data supports controlling both.

*Comment - Controlling both N and P will double treatment costs. Future water quality conditions may be different.*

Response - Looking back over the last 12 years, control actions taken on the Clark Fork do not indicate that controlling only N or P will likely be protective of water quality.

*Question - I am concerned about locking requirements to control N and P into rules and making treatment control investment decisions accordingly. Modeling or other water quality studies may determine that controlling both N and P but not both is not necessary.*

Answer - Site specific criteria can be adopted if it can be shown that controlling only N or P would protect water quality. However, available information supports setting criteria and controlling for both.

### **Rule Adoption Schedule**

George Mathieus stated that DEQ intends to present a rule package addressing nutrient criteria to the Board of Environmental Review (BER) in July. This schedule would allow an additional couple of NWG meetings prior to DEQ's completion of the rule package. On March 23, DEQ will brief the BER on the nutrient criteria development.

*Comment - Cities have at least a couple of outstanding issues regarding the numeric nutrient criteria. One is the five year duration of permits compared to the 20-year financing cycle. The other is affordability and the 1-2% sliding scale. Municipalities are looking at waste water and other environmental issues.*

Response - DEQ has not adopted the 1-2% sliding scale; we have merely acknowledged that EPA agrees with it. We may have to adjust the general variance numbers post 2016. We cannot deviate from what is technologically and economically realistic. We are obligated to look at moving closer to the numeric nutrient criteria. We also are aware of the challenge to plan for twenty year financial cycles when the permit cycle is five years. However, we know the current criteria set in statute, and will place them and the variance process in rules.

*Comment - A 2% increase would mean a \$75 per month increase in bills for waste water customers, an amount that many could not afford.*

Response - The sliding scale affordability limit is relevant to the individual variance. Everyone will not be required to increase bills by 2%. The criteria for the individual variance consider the cost of municipal infrastructure upgrades including but not limited to the waste water treatment plant. We assume that the individual variance will be used infrequently. Most communities will use the general variance. And those communities that do choose to apply for an individual variance will very likely be having economic difficulties, and would therefore have lower secondary scores, and so the % of median household income they would have to pay towards the upgrade (per the sliding scale) would be  $\leq 1.2\%$  MHI. Post 2016 may be different. The statutory permit levels sunset in 2016. We have put in the draft rules criteria for considering post-2016 changes to the general variance based on input from the NWG.

*Question - What happens to the rules when the statute sunsets?*

Answer - The rules do not automatically sunset. They stay in place until they are changed.

*Comment - Municipalities should provide more detailed input on the post-2016 criteria.*

Response - DEQ would welcome feedback from the cities on the criteria and on the draft of DEQ-12.

*Comment - I believe the July schedule for submitting the rule package to the BER is optimistic given the fact that the NWG has not yet seen the private sector demonstration of substantial and widespread economic impacts for the general variance, the changes to the numeric nutrient standards which are not complete, and our need to review DEQ-12.*

## **NWG Work Plan**

Based on the discussion at this meeting, the participants in this meeting asked that the following topics remain on the NWG work plan:

- Review of the private sector significant and widespread economic impact demonstration;
- Discussion of DEQ's TMDL methodology for lakes;
- Discussion of the Butte-Silver Bow mass versus concentration permit specification;
- Detailed concerns from the municipalities; and
- Review of DEQ-12.

Given these topics and DEQ's desire to have the NWG members to sign off on the rule making package before submitting it to the Board of Environmental Review, DEQ will likely revise the schedule for adopting the rules. Rules may not be considered for adoption until the fall of 2012.

### **Public Comment**

There was no additional public comment

### **Meeting Schedules**

The next meeting of the NWG was set for Thursday, April 5, 2012 in Helena at a location to be announced.

**Appendix 1**  
**NWG Attendance List**  
**February 27, 2012**

**Members**

Scott Murphy	Morrison-Maierly, Inc.
Chris Brick	Clark Fork Coalition
Michael Perrodin	BNSF Railway
Dave Galt	Montana Petroleum Association
Mark Lambrecht	WETA
Dave Aune	Great West Engineering
Brian Sugden	Plum Creek
Shari Johnson	City of Polson and Ronan
John Rundquist	City of Helena - Montana League of Cities and Towns (MLCT)

**Alternate Members**

Doug Parker	Hydrometrics (alternate for Debbie Shea)
Kate Miller	Montana Department of Commerce (alternate for Jim Edgcomb)

**Non-Voting Members**

Dr. Mike Suplee	DEQ, Water Quality Standards Section, Water Quality Specialist
George Mathieus	DEQ Planning, Prevention and Assistance Division Administrator
Dr. Jeff Bland	DEQ Economist

**Other Meeting Participants**

Alec Hansen	Montana League of Cities and Towns
Rosemary Rowe	EPA
Bob Bukantis	DEQ, Water Quality Standards Section Supervisor
Tina Laidlaw	EPA
Claudia Massman	DEQ Attorney
Paul Yakawich	DOWL HKM
Amy Steinmetz	DEQ Environmental Science Specialist
Susan Eleyne	Browning, Kaleczyc, Berry & Hoven
Carson Coate	EPA - Montana Office
Jenny Chambers	DEQ Water Protection Bureau Chief
Judel Buls	AE2S, Inc.
Mike Jacobson	City of Great Falls
Mark Bostrom	DEQ Water Quality Planning Bureau Chief
Robert Ray	DEQ Water Quality Protection Section Supervisor
Dave Clark	HDR
Amanda McInnis	HDR
David Mumford	City of Billings (via telephone)

**NWG Facilitator**

Gerald Mueller	Consensus Associates
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