Nutrient Work Group

May 11, 2022

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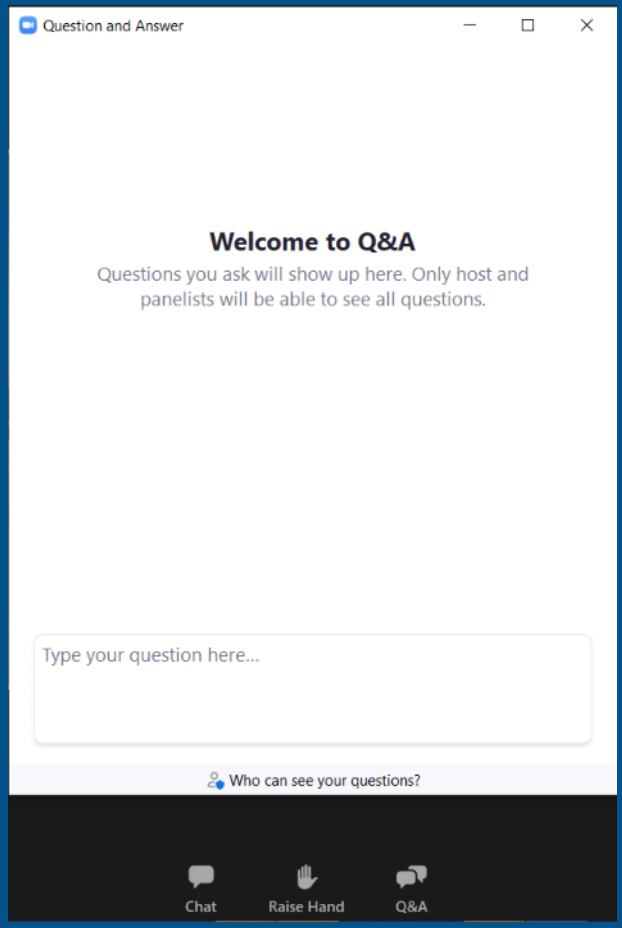
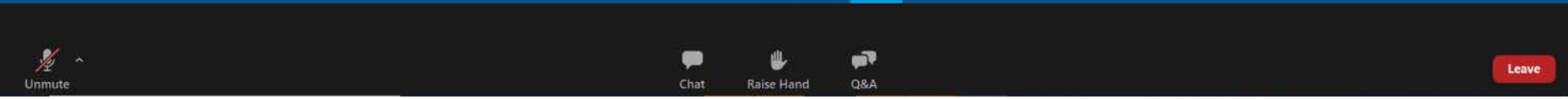
Welcome!

- This meeting has been converted to a webinar
- NWG members will be panelists
- Members of the public can raise their hand or use the Q&A feature to ask questions during the public comment portion of the meeting
- *9 raises your hand if you're on the phone
- State your name and affiliation before providing your comment





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Agenda

Meeting Goal: Discussion of updated draft rule and additional related topics

Preliminaries

- Nutrient Work Group Roll Call
- Water Quality Division Administrator Updates

Updated Regulatory Framework and AMP Process and Related Topics

- Updated Rule Discussion
- Reasonable Potential Analysis
- Application of Ecoregional Values
- AMP-TMDL Relationship

Public Comment & Close of Meeting

- Public Comment
- Meeting Schedule

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Introductions

Nutrient Work Group Members

Interest Group	Representative	Substitute
Point Source Discharger: Large Municipal Systems (>1 MGD)	Louis Engels	
Point Source Discharger: Middle-Sized Mechanical Systems (<1 MGD)	Shannon Holmes	
Point Source Discharger: Small Municipal Systems with Lagoons	Rika Lashley	
Point Source Discharger: Non-POTW	Alan Olson	
Municipalities	Kelly Lynch	
Mining	Tammy Johnson	
Farming-Oriented Agriculture	John Youngberg	
Livestock-Oriented Agriculture	Jay Bodner	
Conservation Organization - Local	Kristin Gardner	
Conservation Organization – Regional	Sarah Zuzulock	
Conservation Organization – Statewide	David Brooks	
Environmental Advocacy Organization	Guy Alsentzer	
Water or Fishing-Based Recreation	Wade Fellin	
Federal Land Management Agencies	Andy Efta	
Federal Regulatory Agencies	Tina Laidlaw	
State Land Management Agencies	Jeff Schmalenberg	
Water Quality Districts / County Planning Departments	Nick Banish	
Soil & Water Conservation Districts – West of the Continental Divide	Samantha Tappenbeck	
Soil & Water Conservation Districts – East of the Continental Divide	Dan Rostad	
Wastewater Engineering Firms	Scott Buecker	
Timber Industry	Julia Altemus	

Updates

- WPCAC Meeting on Friday (5/13 at 10 a.m.)
- EPA Action Letter

Updated Rule Discussion

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Rule Sections-Overview

New Rule I. Implementation of Narrative Nutrient Standards Through The Adaptive Management Program

1. MPDES permits may include limitations and conditions consistent with …. AMPs...
2. Adaptive Management for Wadeable Streams and Medium Rivers
   - *DEQ determine if P prioritization is appropriate*
   - *If appropriate, TP limit to protect sensitive beneficial uses derived from ecoregion range*
   - *TP limit in permit*
     - *AMP monitoring plan: instream response variables and nutrients as special conditions (near field)*
     - *Pollutant Minimization including facility optimization*

Note: yellow text is for explanatory purposes.

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Rule Sections-Overview, Cont.

2. Adaptive Management for Wadeable Streams and Medium Rivers
   - *DEQ may conclude, based on TP reductions and response variable monitoring and other data, that uses are now supported*
     - *Continue to monitor only*

   - *DEQ may conclude P prioritization is not appropriate or was not successful in addressing water quality problem*
     - *TP and TN limits derived from ecoregion ranges*
     - *AMP implementation plan: watershed-scale nutrient reduction activities*

Note: yellow text is for explanatory purposes.

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Rule Sections-Overview, Cont.

New Rule I. Implementation of Narrative Nutrient Standards Through The Adaptive Management Program

3. Adaptive Management for Large Rivers

- *DEQ to use mechanistic models where feasible*
- *Model used to derive P limits for multiple point sources along reach; end point is protection of uses/water quality*
  - *Relative load, current treatment, upgrade costs considered*
- *Large river field data used to evaluate effectiveness*
  - *If effective, P permit limits continue*
  - *If ineffective, AMP implementation plan: similar in content to wadeable streams/small rivers*

Note: yellow text is for explanatory purposes.

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Rule Sections-Overview, Cont.

4. A permittee under the adaptive management program is not precluded from pursuing other regulatory compliance options including ...a variance, a compliance schedule, reuse, trading, recharge, or land application

5. The department adopts and incorporates by reference Department Circular DEQ-15...
   - *Additional detail on rule sections provided in Circular*

Note: yellow text is for explanatory purposes.

Reasonable Potential Analysis

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Reasonable Potential Analysis

Why do we do it?

What is it?

How is it done?

Why?

- Limitations must control all pollutants or pollutant parameters which the Director (DEQ) determines are or may be discharged at a level that will *cause*, *have the reasonable potential* to cause or *contribute* to an excursion above any state water quality standard, including narrative criteria.

- CFR Part 122.44 and Montana Administrative Rules 17.30.1344
- Part 122 titled EPA Administered Permit Programs: The National Pollutant Discharge Elimination System
  - 122.44 titled Establishing limitations, standards and other permit conditions

What?

- Used to determine whether a discharge, alone or in combination with other sources of pollutants to a waterbody could lead to excursion above the water quality standard.

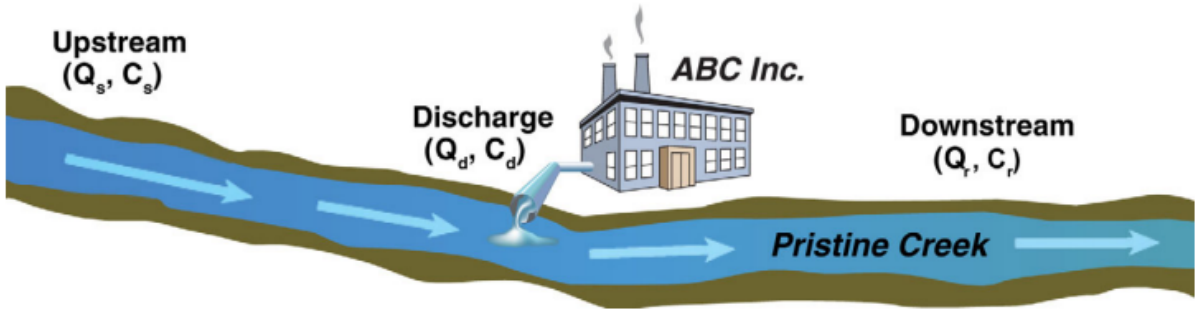
- Analysis documented in the fact sheet that supports and explains the conditions of the permit including the inclusion of water quality-based effluent or the lack of WQBELs.

How?

- Quantitative
  - Typically for numeric water quality standards using the mass balance equation

- Qualitative
  - Often used narrative water quality standards using best professional judgment on case-by-case basis. May include quantitative analysis although not the mass balance equation

Quantitative; Mass Balance Equation



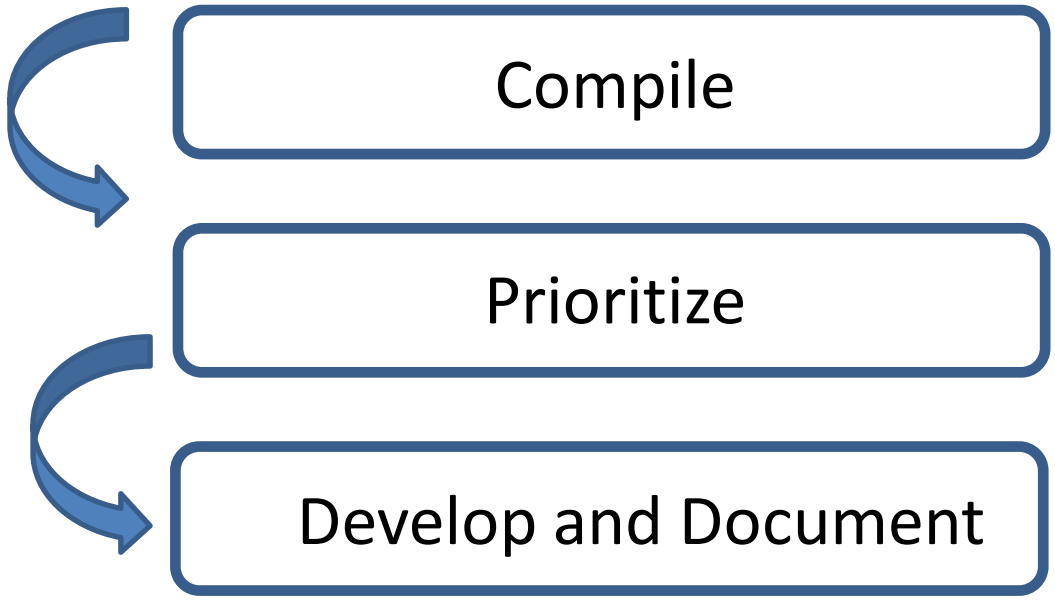
Mass = **Flow** (Q) in million gallons per day (mgd) or cubic feet per second (cfs) X **Pollutant concentration** (C) in milligrams per liter (mg/L)

$$Q_sC_s + Q_dC_d = Q_rC_r$$

where

Q_s	=	stream flow in mgd or cfs above point of discharge
C_s	=	background in-stream pollutant concentration in mg/L
Q_d	=	effluent flow in mgd or cfs
C_d	=	effluent pollutant concentration in mg/L
Q_r	=	resultant in-stream flow, after discharge in mgd or cfs
C_r	=	resultant in-stream pollutant concentration in mg/L (after complete mixing occurs)

Qualitative; Best Professional Judgement



Research and Compile Data

Condition of the Receiving Waterbody

- Impairment status (303d list)
- Downstream segment: distance to, impairment status, lake or reservoir present
- Low flow condition (7Q10, 14Q5)
- Proximity of other dischargers that might cause cumulative effects

Condition of the Facility

- Type of facility and treatment
- Discharge strategy-continuous, batch or seasonal
- Upgrades and age of treatment
- Effluent concentrations
- Optimization work undertaken
- Compliance history
- Compliance inspections—notes, O&M deficiencies, neglected infrastructure

Pollutant Characteristics

- Environmental fate/persistence

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Prioritize Data

Condition of the Receiving Waterbody

- **Impairment status (303d list)**
- Downstream segment: distance to, impairment status, lake or reservoir present
- Low flow condition (7Q10, 14Q5)
- Proximity of other dischargers that might cause cumulative effects

Condition of the Facility

- **Type of facility and treatment**
- **Discharge strategy-continuous, batch or seasonal**
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Pollutant Characteristics

- Environmental fate/persistence

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Develop and Document Outcomes
Example one

Summary of Facility Information

- Small town in Eastern Montana
- Designed for total retention of effluent with lined lagoon during winter months
- Land application of effluent during summer months
- Receiving waterbody low flow condition is 3 cfs
- Receiving water body impaired for nutrients

Condition of the Receiving Waterbody

- **Impairment status (303d list)**
- **Low flow condition (7Q10, 14Q5)**

Condition of the Facility

- **Type of facility and treatment**
- **Discharge strategy-continuous, batch or seasonal**

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Develop and Document Outcomes
Example one

Document in the Fact Sheet rationale:

Small eastern Montana town is designed to retain effluent during the winter months. The narrative nutrient standards apply during July 1 through September 30. Because the facility is designed and approved under Circular DEQ-2 for land application, DEQ finds that permit will include a narrative effluent limit prohibiting discharge during months that the narrative nutrient standard apply and therefore the discharge will not cause or contribute to nuisance algae growth.

Enforceable Conditions in the Permit

Part I of the permit include effluent limit “Small eastern Montana town is prohibited from discharging July 1 through September 30, annually”.

Part 2 of the permit includes effluent monitoring weekly for Total Nitrogen and Total Phosphorus during periods of discharge.

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Example two

Summary of Facility Information

- Mid-sized town in Western Montana
- Discharge continuously with average daily design flow of .75 million gallons per day
- Receiving water body recently reassessed and is now impaired for nutrients
- Effluent monitoring from the facility indicates effluent concentrations for both TN and TP have increased over past 5 years
- Inspection reports note failure to complete optimization efforts

Condition of the Receiving Waterbody

- **Impairment status (303d list)**
- **Low flow condition (7Q10, 14Q5**)

Condition of the Facility

- **Type of facility and treatment**
- **Discharge strategy-continuous, batch or seasonal**
- **Effluent concentrations**
- **Compliance history**
- **Compliance inspections—notes, O&M deficiencies, neglected infrastructure**

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Develop and Document Outcomes
Example two

Document in the Fact Sheet rationale:

Midsized western Montana town is identified as a probable source of impairment for the receiving waterbody newly listed as impaired in the latest Integrated Report. The previously issued MPDES permit including monitoring requirements only citing the unimpaired status of the receiving waterbody and the large dilution ratio of receiving water body to effluent discharge volume (700:1). The past 5 years of TN and TP effluent concentrations show a 1-2.3 mg/L increase. DEQ finds that the discharge is causing or contributing to the exceedance of the narrative nutrient standard and nuisance algae growth.

Enforceable Conditions in the Permit

Part I of the permit includes load based effluent limits for total nitrogen and total phosphorus expressed as monthly averages.

Part 2 of the permit includes effluent monitoring weekly for Total Nitrogen and Total Phosphorus.

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Example three

Summary of Facility Information

- Small town in northeastern Montana
- Batch discharger with average daily design flow of .1 million gallons per day
- Receiving water body listed impaired for nutrients with a TMDL pending
- Optimization efforts have reduced TN and TP concentrations to levels earning an EPA Performance and water quality protection award
- Inspection reports the continued and committed optimization strategy

Condition of the Receiving Waterbody

- **Impairment status (303d list)**
- **Low flow condition (7Q10, 14Q5**)

Condition of the Facility

- **Type of facility and treatment**
- **Discharge strategy-continuous, batch or seasonal**
- **Effluent concentrations**
- **Compliance history**
- **Compliance inspections—notes, O&M**

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Develop and Document Outcomes
Example three

Document in the Fact Sheet rationale:

Small northeastern Montana town with a small population (under 300) with an oxidation ditch for wastewater treatment. While not specifically designed for nutrient removal the treatment system has achieved significant nutrient reductions through optimization efforts and minor operation modifications by the operator. Small northeastern Montana town has received a performance award from EPA for optimization work and water quality protection. The receiving waterbody is listed as impaired for nutrient but has not been reassessed since the 1996 303(d) list and a TMDL is pending. DEQ find that the existing TN and TP load limits will be maintained and protect beneficial uses while the TMDL is pending.

Enforceable Conditions in the Permit

Part I include effluent limit TN and TP load limits and narrative effluent limit to continue optimization efforts.

Part 2 of the permit includes effluent monitoring weekly for Total Nitrogen and Total Phosphorus.

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Application of Ecoregional Values

Ecoregional Ranges*

Ecoregional Zone	Ecoregion (Level III)	Ecoregion (Level IV)	Maximum Recommended Range	
			Total Phosphorus (µg/L)	Total Nitrogen (µg/L)
Western	Northern Rockies (15)	all	20 - 40	210 - 1,210
Western	Canadian Rockies (41)	all	23 - 62	325 - 821
Western	Idaho Batholith (16)	all	20 - 62	210 - 718
Western	Middle Rockies (17)	all except 17i	20 - 40	210 - 1,210
Western	Middle Rockies (17)	Absaroka-Gallatin Volcanic Mountains (17i)	61 - 105[b]	Use values from the lower end of the range for the Middle Rockies (17)
Western (transitional)	Northwestern Glaciated Plains (42)	Sweetgrass Upland (42l), Milk River Pothole Upland (42n), Rocky Mountain Front Foothill Potholes (42q), and Foothill Grassland (42r)	23 - 80[c]	445 - 775
Western (transitional)	Northwestern Great Plains (43)	Non-calcareous Foothill Grassland (43s), Shields-Smith Valleys (43t), Limy Foothill Grassland (43u), Pryor-Bighorn Foothills (43v), and Unglaciated Montana High Plains (43o)[a]	20 - 41[d]	439 - 1,125
Eastern	Northwestern Glaciated Plains (42)	all except those listed above for 42	70 - 150	540 - 1,830
Eastern	Northwestern Great Plains (43) and Wyoming Basin (18)	all except for those listed above for 43, and 43c below	70 - 150	540 - 1,830
Eastern	Northwestern Great Plains (43)	River Breaks (43c)	None recommended	None recommended

[a] For the Unglaciated High Plains ecoregion (43o), the range applies only to the polygon located just south of Great Falls, MT.

[b] Based on the 25th and 75th percentiles of the natural background concentrations in this level IV ecoregion.

[c] Lower end based on streams' origins in the Canadian Rockies; upper end based on 75th percentile of natural background for these ecoregions.

[d] Lower end based on similarity to Middle Rockies, upper end based on Elk Creek reference site.

*Subject to final review and refinement prior to rulemaking

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PUBLIC COMMENT

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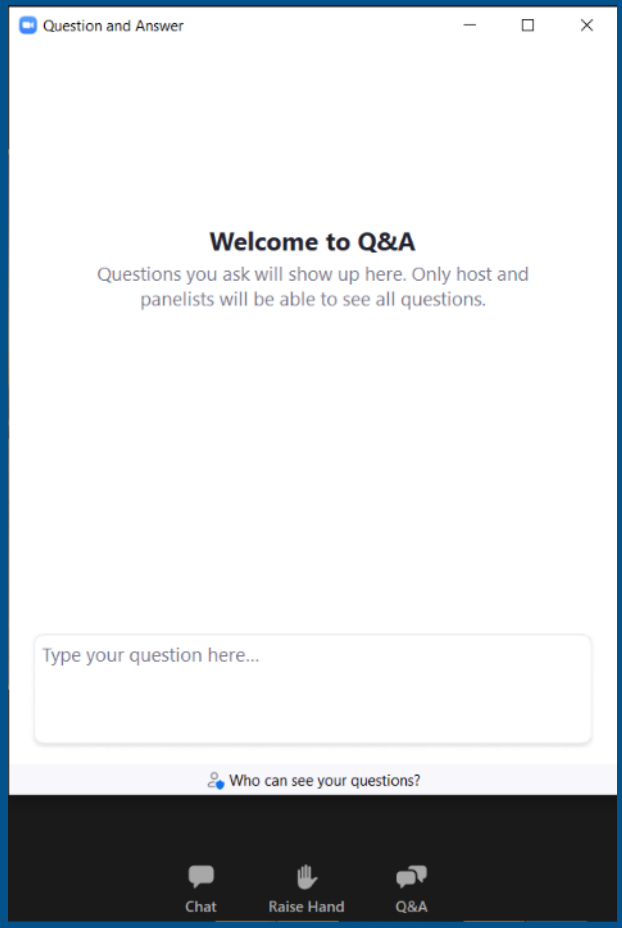
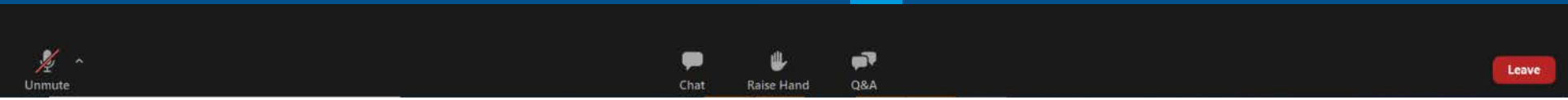
Questions/ Comments

- Raise hand (*9 if on the phone) or type questions into the Q&A
- DEQ will unmute you if you wish to provide your comment orally
- If calling by phone, press*6 to unmute
- State your name and affiliation before providing your comment





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Next Meetings

- May 17, 2022: 9-11 a.m.
- May 24, 2022: 9-11 a.m.
- May 25, 2022: 9-11 a.m.

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Thanks for Joining Us

Contact:
Christina Staten
CStaten@mt.gov

To submit comments or questions

Submit Comments or Questions

https://deq.mt.gov/water/Councils

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