Nutrient Work Group

September 28, 2022

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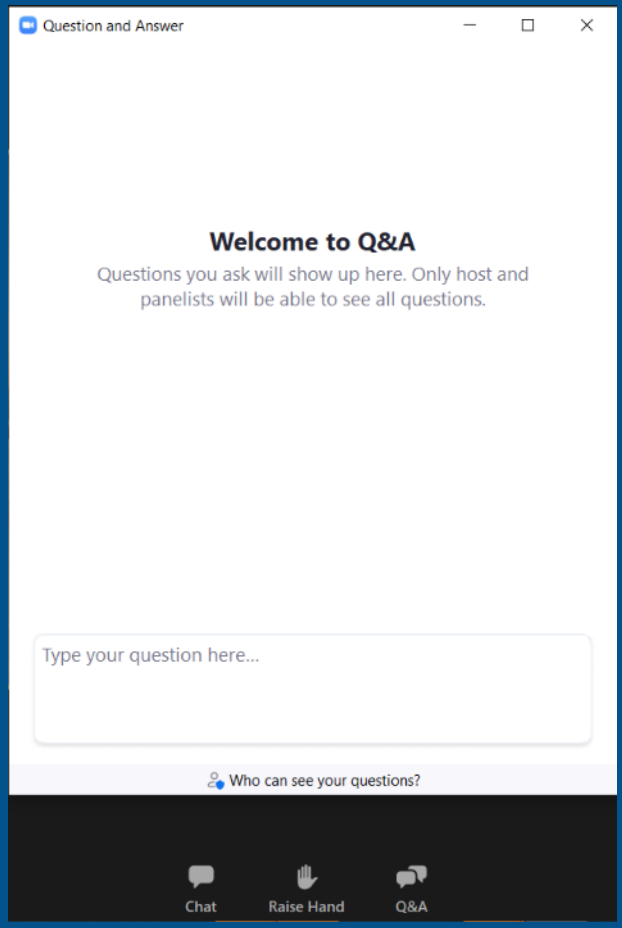
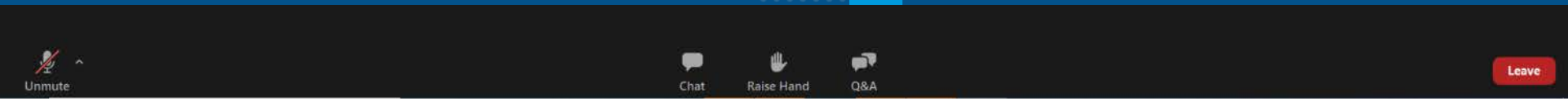
Welcome!

- 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: Discuss translation of the narrative and the AMP – MPDES permit interaction

Preliminaries

- Nutrient Work Group Roll Call

DEQ Updates

- Proposed Timeline for Discussion Topics

AMP Process

- Translation of the Narrative: Standards Interpretation Framework
- Using Standards Interpretation Framework for RP
- AMP – MPDES Permit Interaction

Public Comment & Close of Meeting

- Public Comment
- Next Meeting

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Roll Call

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	Rachel Cone	
Livestock-Oriented Agriculture	Raylee Honeycutt	
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	

DEQ Updates

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Remaining Topics to Discuss

- **AMP process**
- **TMDL – AMP interaction**
- **Addressing EPA's technical comments in August 2021 letter on response variables and thresholds**
- Translation of the narrative for all CWA programs
- AMP – MPDES permit interaction
- Reasonable potential analysis
- **Nutrient assessment method process**
- Protection of downstream uses
- Revised guidance document
- Final rule language
- Case study

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Outstanding Business Items

- Macroinvertebrate Metrics Contract Complete: early 2023

- NWG Members Question: Meet During Session?

Discussion Topic	NWG Meeting	Date
• AMP Process (templates) • TMDL – AMP Interaction	August 24	
• Addressing EPA's Technical Comments on Response Variables & Thresholds • Translation of the Narrative • Nutrient Assessment Method Process	September 14	
• Translation of the Narrative (Decision Framework) • AMP – MPDES Permit Interaction	September 28	
• Translation of the Narrative (Ecoregional Ranges) • Reasonable Potential Analysis Process	October 12	
• Protection of Downstream Uses • Funding / Impacts to DEQ • Incentive Program	October 26	
Placeholder meeting	November 9	
• Case Study • Reasonable Potential Analysis Guidance Document	November 30	
Updated Versions of Rule, Circular, and Guidance Document	N/A	December 5
• Recognition / Celebration of Progress • Outstanding Items Discussion	December 14	

Narrative Nutrient Standards Interpretation Framework

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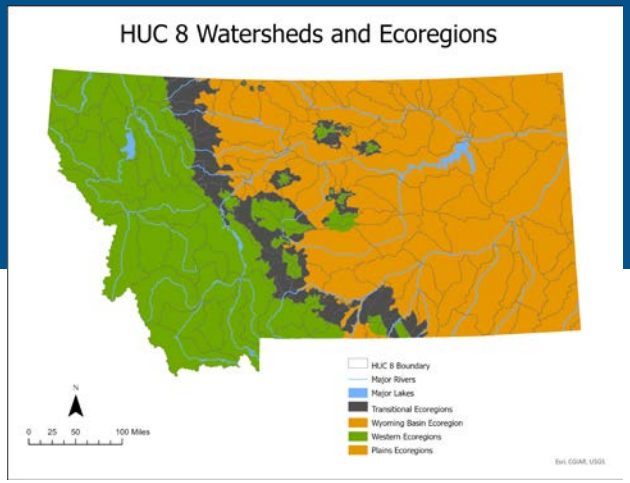
Narrative Nutrient Standards Translator

The DRAFT translator is a matrix of causal (nutrient) and response variables. Specified response variables and thresholds are associated with specific beneficial uses and regions of the state. "**X**" indicates the variable applies. If marked with X, variable would be required to be measured at monitoring sites in an AMP monitoring plan.

			Response Variable (threshold)				
Region	**Associated Benefical Use**	**Nutrient Causal Variables (*see* nutrient concentration ranges, by ecoregion)**	**DO Delta**	**Benthic Chl*a* ; AFDW**	**% filamentous algae bottom cover**	**Macroinvertebrates**	***Notes***
Western and transitional ecoregions	Recreation	**X**		**X** (150 mg Chla/m^2; 35 g AFDM/m^2)	**X** (30% cover)		
Western and transitional ecoregions	Aquatic Life	**X**	**X** (TBD; probably ~3.0 or less)			**X** (metric, threshold TBD)	
Western and transitional ecoregions, high gradient streams (>1% slope)	Aquatic Life	**X**				**X** (metric, threshold TBD)	*Slope break based on findings in 3/19/2014 DEQ study (memo)*
Eastern ecoregions	Aquatic Life	**X**	**X** (TBD; probably ~5.0)			**X** (metric, threshold TBD)	

Some combinations of results will be harder to interpret (e.g., low nutrient concentrations, acceptable DO delta, but poor macroinvertebrates score).
-A decision framework will be needed to address these situations



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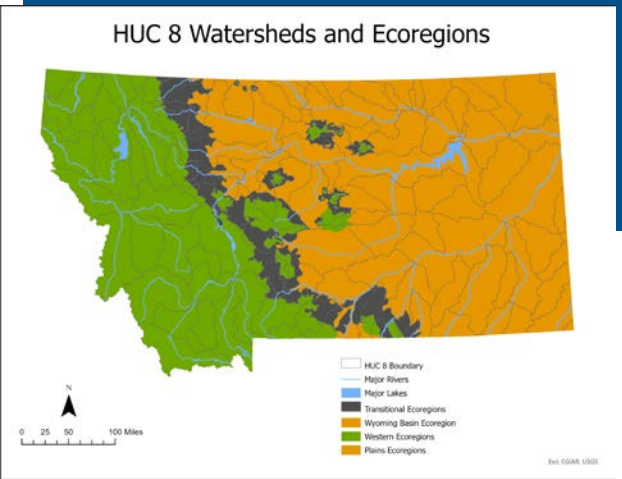
Response variable thresholds are numeric values derived through scientific analysis that achieve biointegrity goals established in law

Example Data Results Combinations

Western and transitional ecoregions—aquatic life use

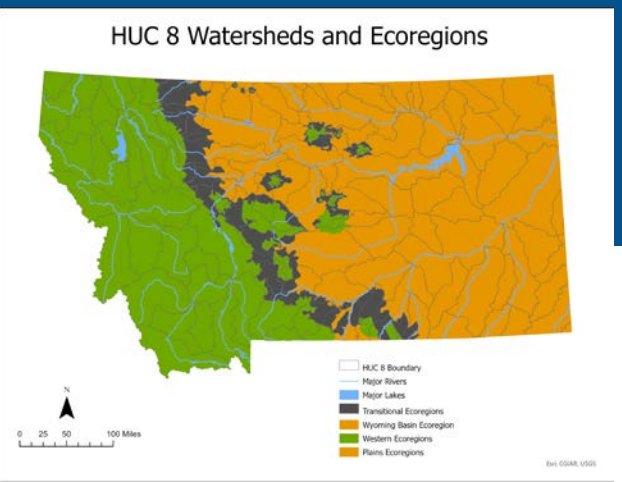
Western and Transitional MT Ecoregions: Aquatic Life Use.				
Criteria				
Nutrient Causal Variables	**Dissolved Oxygen Delta**	**Macroinvertebrate Metric**	**Is the Narrative Nutrient WQ Standard Achieved?**	**Notes**
Meets	Meets	Meets	Yes	
Meets	Meets	Exceeds	TBD	Needs additional data—what might cause the macroinvertebrates to exceed their threshold when the other variables look OK?
Meets	Exceeds	Meets	TBD	Needs futher investigation—what other factors might be influencing DO delta? Naturally high macrophyte populations?
Meets	Exceeds	Exceeds	No	High uptake likely lowering nutrient concentration.
Exceeds	Meets	Meets	Yes	
Exceeds	Meets	Exceeds	No	
Exceeds	Exceeds	Meets	No	
Exceeds	Exceeds	Exceeds	No	



Example Data Results Combinations

Western and transitional ecoregions—recreation use

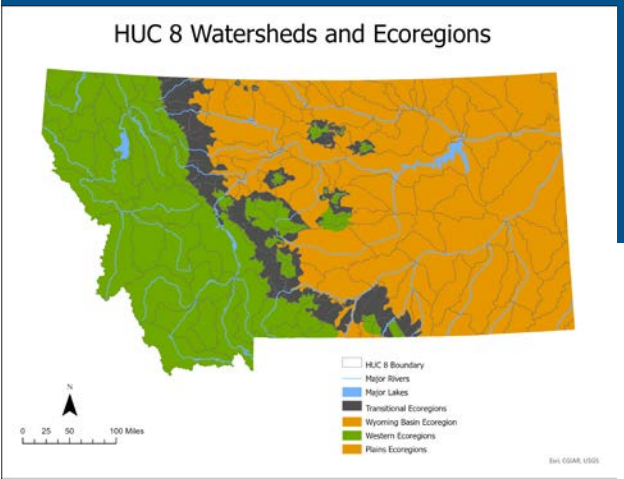
Western and Transitional MT Ecoregions: Recreation Use.				
Criteria				
Nutrient Causal Variables	**Benthic Chlorophyll *a* ; Ash Free Dry Weight**	**% Filamentous Algae Cover**	**Is the Narrative Nutrient WQ Standard Achieved?**	**Notes**
Meets	Meets	Meets	Yes	
Meets	Meets	Exceeds	No	
Meets	Exceeds	Meets	No	
Meets	Exceeds	Exceeds	No	High nutrient uptake likely lowering nutrient concentrations
Exceeds	Meets	Meets	Yes	
Exceeds	Meets	Exceeds	No	
Exceeds	Exceeds	Meets	No	
Exceeds	Exceeds	Exceeds	No	



Example Data Result Combinations

Eastern Montana ecoregions—aquatic life use

Eastern MT Ecoregions: Aquatic Life Use.				
Criteria				
Nutrient Causal Variables	**Dissolved Oxygen Delta**	**Macroinvertebrate Metric**	**Is the Narrative Nutrient WQ Standard Achieved?**	**Notes**
Meets	Meets	Meets	Yes	
Meets	Meets	Exceeds	TBD	Needs additional data—what might cause the macroinvertebrates to exceed their threshold when the other variables look OK?
Meets	Exceeds	Meets	TBD	What other factors might be influencing DO delta to be high (drought cycle?)
Meets	Exceeds	Exceeds	No	High nutrient uptake likely lowering nutrient concentrations.
Exceeds	Meets	Meets	Yes	
Exceeds	Meets	Exceeds	No	
Exceeds	Exceeds	Meets	No	
Exceeds	Exceeds	Exceeds	No	



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Narrative Nutrient Standards Interpretation Framework used for Reasonable Potential Analysis

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Reasonable Potential Analysis

Limitations must control all pollutants or pollutant parameters which the Director 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 state narrative criteria

Or

Reasonable potential analysis is used to determine whether a discharge, alone or in combination with other sources of pollutants to a waterbody and under a set of conditions arrived at by making a series of reasonable assumptions, could lead to an excursion above an applicable water quality standard.

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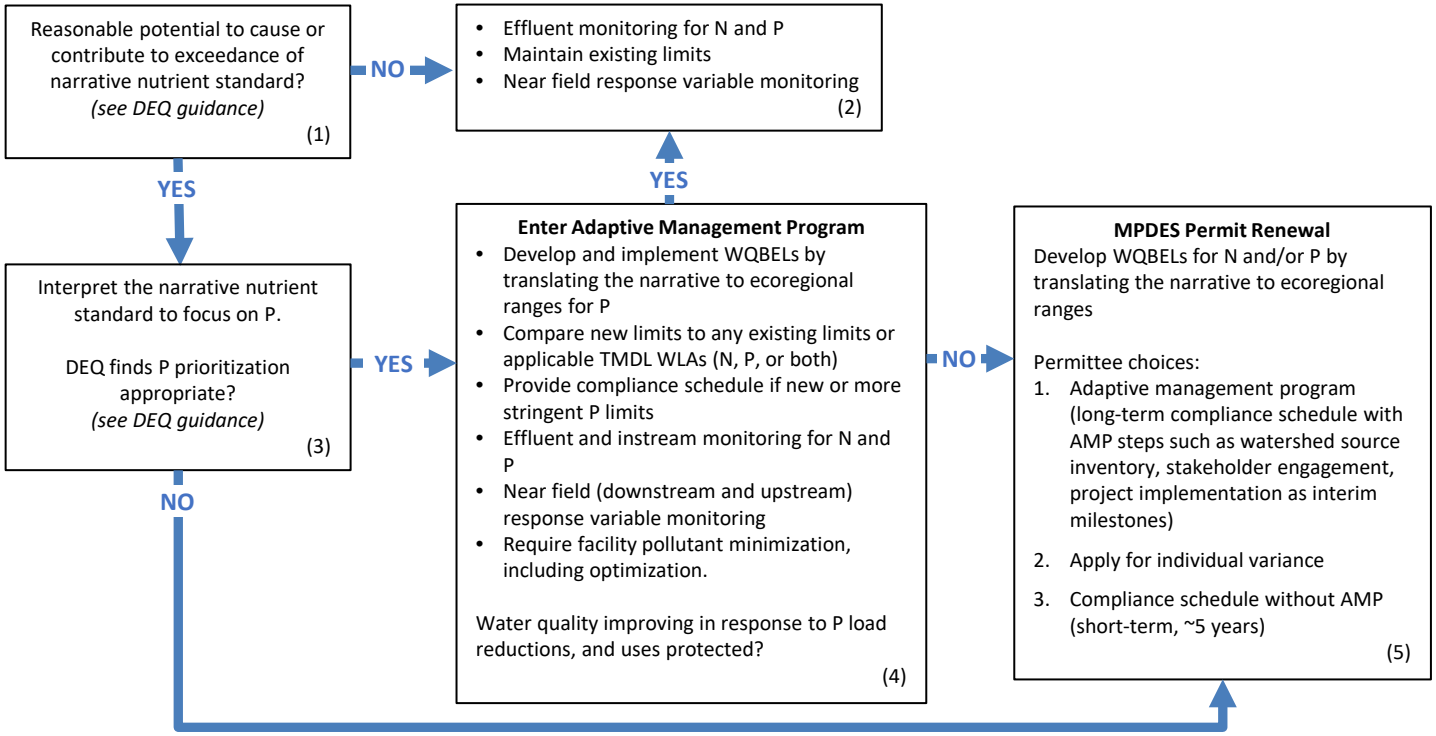
Permitting Process for Publicly-Owned Mechanical Facilities



Reasonable Potential Analysis

Two Scenarios:

1) RP with Response Variable Data
   - Use Narrative Nutrient Standards Interpretation Framework

2) RP *without* Response Variable Data
   - Impaired Waterbodies
   - Unimpaired Waterbodies

Aquatic Life Use: Western and Transitional Ecoregions

Table 2. Western & Transitional Ecoregions: Aquatic Life

Criteria			Is the Narrative Nutrient WQ Standard achieved?	Is there RP?
Nutrient Causal Variables	Dissolved Oxygen delta	Macroinvertebrates		
Meets	Meets	Meets	Yes	No
Meets	Meets	Exceeds	TBD	TBD
Meets	Exceeds	Meets	TBD	TBD
Meets	Exceeds	Exceeds	No	Yes
Exceeds	Meets	Meets	Yes	No
Exceeds	Meets	Exceeds	No	Yes
Exceeds	Exceeds	Meets	No	Yes
Exceeds	Exceeds	Exceeds	No	Yes

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Recreational Use: Western and Transitional Ecoregions

Table 1. Western & Transitional Ecoregions: Recreational Uses

Criteria			Is the Narrative Nutrient WQ Standard achieved?	Is there RP?
Nutrient Causal Variables	Benthic Chlorophyll a; Ash Free Dry Weight	% Filamentous Algae bottom cover		
Meets	Meets	Meets	Yes	No
Meets	Meets	Exceeds	No	Yes
Meets	Exceeds	Meets	No	Yes
Meets	Exceeds	Exceeds	No	Yes
Exceeds	Meets	Meets	Yes	No
Exceeds	Meets	Exceeds	No	Yes
Exceeds	Exceeds	Meets	No	Yes
Exceeds	Exceeds	Exceeds	No	Yes

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Recreational Use: Western and Transitional Ecoregions in High Grade Streams

Table 3. Western & Transitional Ecoregions: Recreational Uses in High Grades Streams

Criteria		Is the Narrative Nutrient WQ Standard achieved?	Is there RP?
Nutrient Causal Variables	**Macroinvertebrates**		
Meets	Meets	Yes	No
Meets	Exceeds	TBD	TBD
Exceeds	Exceeds	No	Yes

Aquatic Life Use: Eastern Ecoregion

Table 4. Eastern Ecoregions: Aquatic Life

Criteria			Is the Narrative Nutrient WQ Standard achieved?	Is there RP?
Nutrient Causal Variables	Dissolved Oxygen delta	Macroinvertebrates		
Meets	Meets	Meets	Yes	No
Meets	Meets	Exceeds	TBD	TBD
Meets	Exceeds	Meets	TBD	TBD
Meets	Exceeds	Exceeds	No	Yes
Exceeds	Meets	Meets	Yes	No
Exceeds	Meets	Exceeds	No	Yes
Exceeds	Exceeds	Meets	No	Yes
Exceeds	Exceeds	Exceeds	No	Yes

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Reasonable Potential analysis without Response Variable Data

Reasonable Potential Analysis

1) Impaired Waterbodies

   If receiving water or immediate downstream assessment unit is listed as impaired on the most recent 303(d) List with probable cause listed as Total Nitrogen, Total Phosphorus, Chlorophyll-a, eutrophication, algae or dissolved oxygen then the discharge has RP to cause or contribute exceedance the narrative nutrient standard.

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Reasonable Potential Analysis

2) Unimpaired Waterbodies

If receiving water or immediate downstream assessment unit is *not* listed as impaired on the most recent 303(d) List with probable cause listed as Total Nitrogen, Total Phosphorus, Chlorophyll-a, eutrophication, algae or dissolved oxygen then the permit writer will consider other available information to determine if water quality-based effluent limits are needed or not

Example RP Outcomes for Unimpaired Waterbodies

1) Optimized, properly operated and maintained facility that consistently achieves TN and TP reductions. Dilution ration of greater than 100:1 (effluent flow compared to seasonal 14Q5) conclude no RP and new/more stringent WQBELs are not required.

2) Current MPDES includes final and effective effluent limitations for nutrients for example prohibition of discharge during summer months, DEQ may find these existing limits protect beneficial uses and new/more stringent WQBELs are not required.

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AMP – MPDES Permit Interaction

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Major Components of an MPDES Permit and Adaptive Management Plan

Cover Page

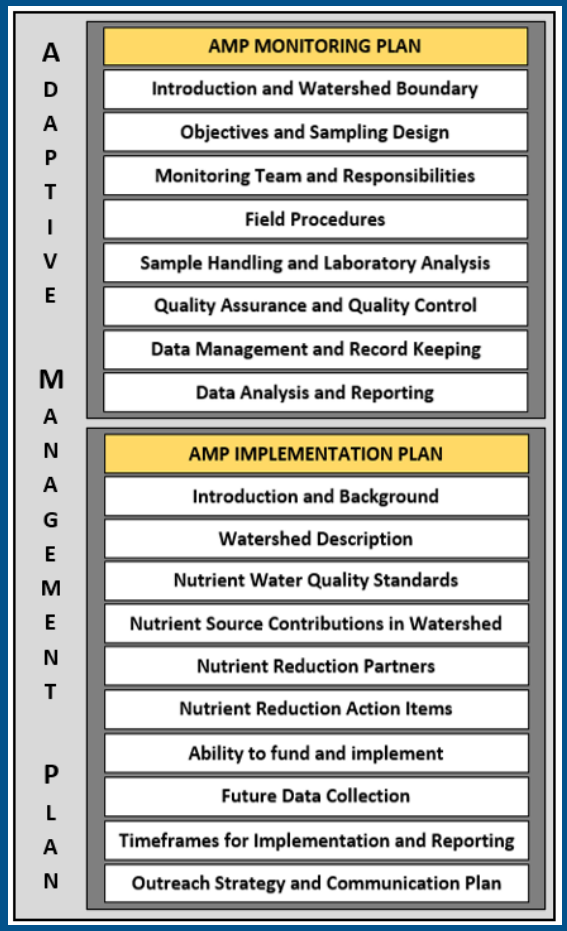
Effluent Limitations, Monitoring Requirements, and Other Conditions
Description of discharge points
Effluent limitations
Monitoring requirements
Special conditions

Monitoring, Recording, and Reporting Requirements
Monitoring procedures
Reporting monitoring results
Compliance schedules
Additional monitoring
Records contents and records retention
Noncompliance reporting
Inspection and entry

Compliance Responsibilities
Duty to comply
Penalties for violations
Duty to mitigate
Proper operation and maintenance
Bypass of treatment facilities
Upset conditions

General Requirements
Planned changes
Signatory requirements
Transfers
Fees
Reopener provisions
Etc.

Definitions



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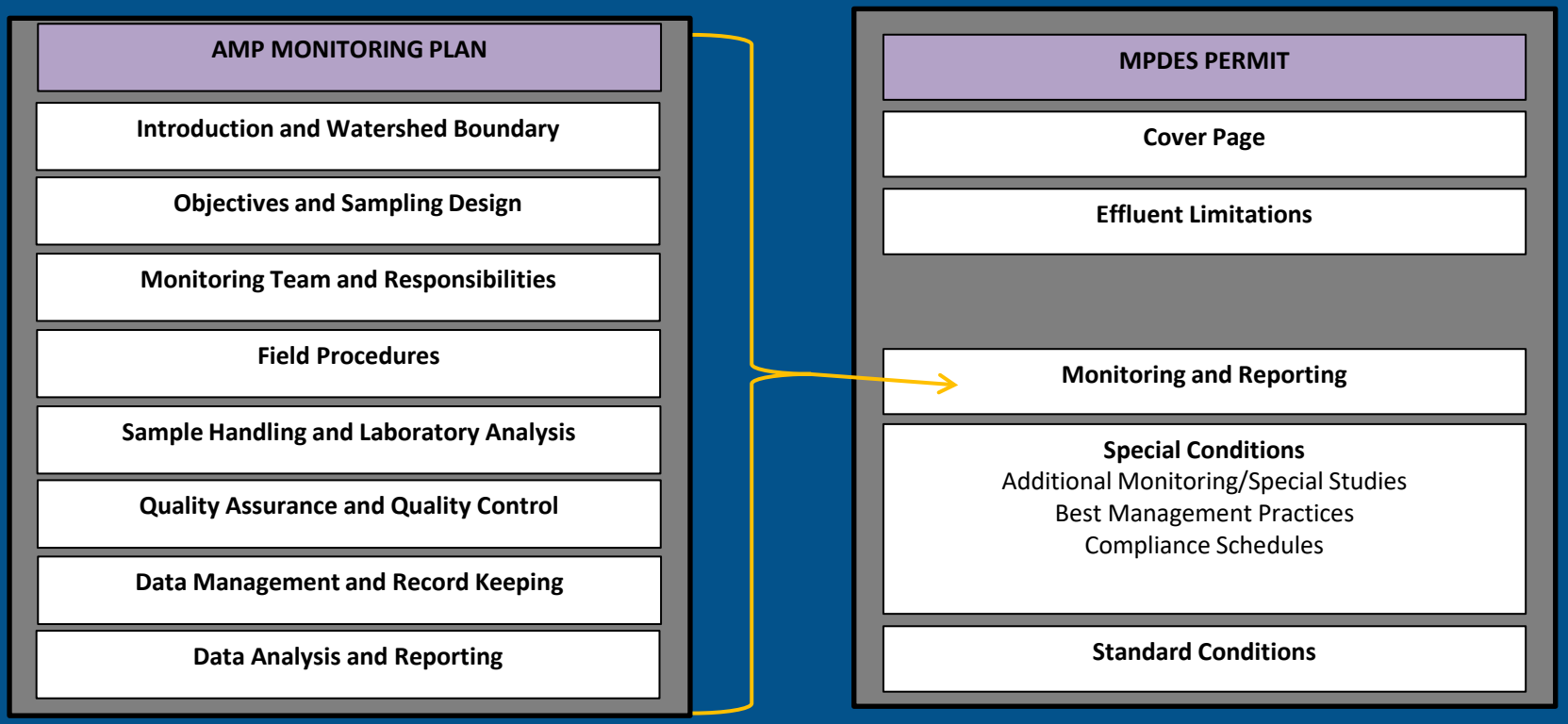
Monitoring Plan and an MPDES Permit



AMP Monitoring Plan Template Sections: 2.3 Monitoring Locations; 2.4 Timeframe and Schedule; 2.5 Parameters; Sections 4.0 through 6.0 incorporate by reference; Section 7.0 through 8.0 Recording Keeping and reporting MPDES conditions

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Example Response Variable Monitoring Table: Near Field Sites

Table 2. Instream Nutrient Response Variable Monitoring Requirements – Near Field

Parameter	Units	Sample Type	Minimum Frequency	Reporting Requirement	RRV (1)
Upstream Benthic Algal Chlorophyll-a (2)	mg/m^2	See SOP	Twice/Season (3)	Seasonal Average and Daily Maximum (4)	0.1
Downstream Benthic Algal Chlorophyll-a (2)	mg/m^2	See SOP	Twice/Season (3)	Seasonal Average and Daily Maximum (4)	0.1
Upstream Benthic Algal Ash Free Dry Weight (5)	g/m^2	See SOP	Twice/Season (3)	Seasonal Average and Daily Maximum (4)	0.1
Downstream Benthic Algal Ash Free Dry Weight (5)	g/m^2	See SOP	Twice/Season (3)	Seasonal Average and Daily Maximum (4)	0.1
Upstream Macroinvertebrates (6)	HBI (6)	See SOP	Once/Season (7)	Single Sample	--
Downstream Macroinvertebrates (6)	HBI (6)	See SOP	Once/Season	Single Sample	--
Upstream Filamentous Algae Percent Bottom Cover (5)	%	Visual (See SOP)	1/Month (8)	Single Sample	1 (?)
Downstream Filamentous Algae Percent Bottom Cover (5)	%	Visual (See SOP)	1/Month (8)	Single Sample	1 (?)
Upstream Dissolved Oxygen Delta	mg/L	Auto Sampler	Continuous (10)	Weekly Average	0.5
Downstream Dissolved Oxygen Delta	mg/L	Auto Sampler	Continuous (10)	Weekly Average	0.5
Total Nitrogen, as N (9)	mg/L	Grab	1/Month (8)	Single Sample	0.07
Total Phosphorus, as P (9)	mg/L	Grab	1/Month (8)	Single Sample	0.003

(1) Required Reporting Value
(2) Samples must be collected and analyzed using DEQ Standard Operation Procedure (SOP) WQPBWQM-011
(3) Season is July through September. Sampling events must be at least 6 weeks apart.
(4) Highest value of the two sampling events. If more than two sampling events, report maximum.
(5) DEQ Assessment Methods (2016).
(6) Hilsenhoff Biotic Index. DEQ Standard Operation Procedure WQBWQM-009
(7) Must be sampled during one of the benthic algal sampling events.
(8) July through September only. Two of the sampling events must pair with the benthic algal events. Report monthly.
(9) Persulfate digestion method.
(10) Minimum 30 continuous days. At least 21 days in August.

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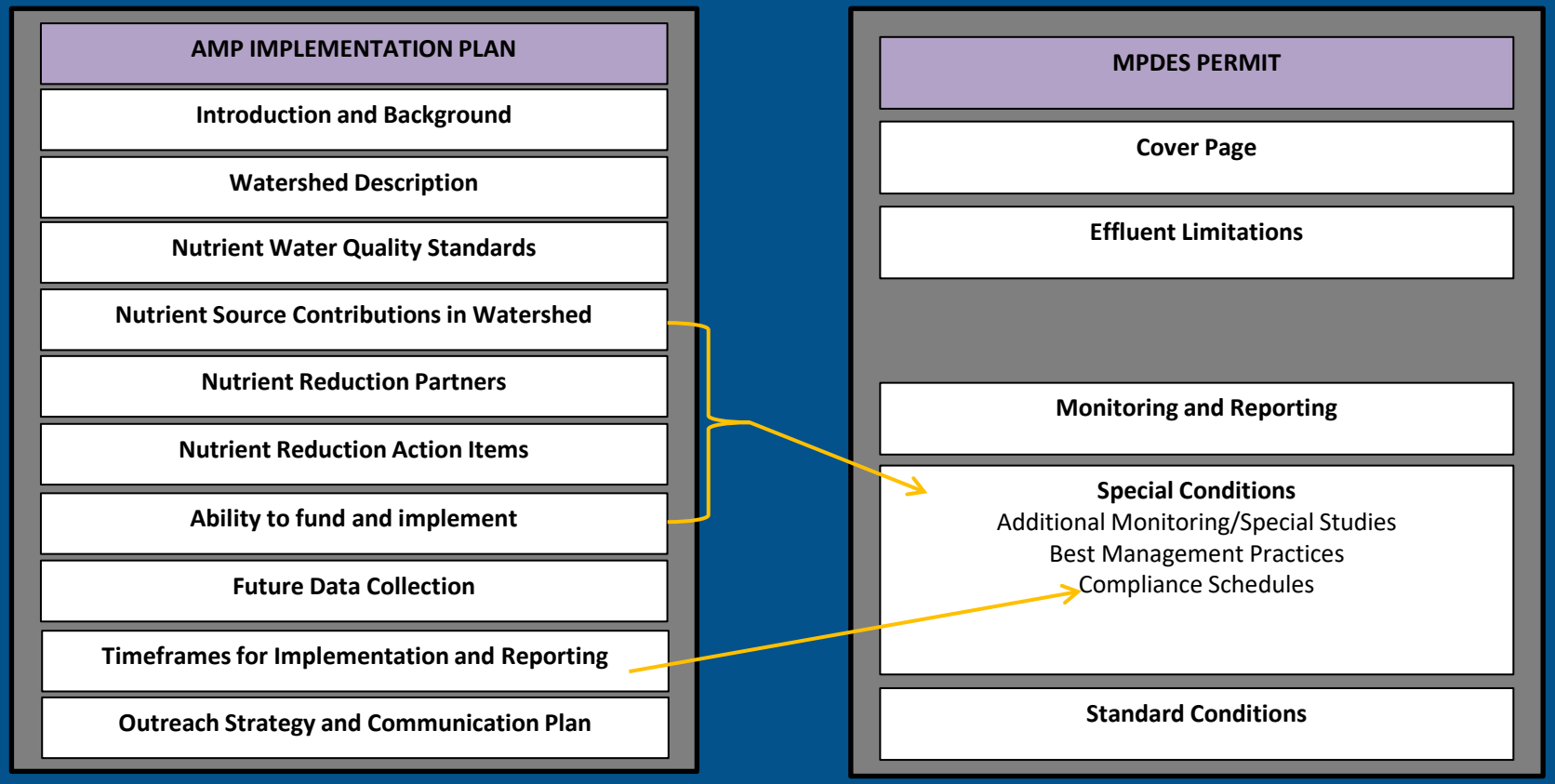
Implementation Plan and an MPDES Permit



Example Permit Conditions Through Time under Implementation Plan

DEQ Approval of Monitoring Plan and Implementation Plan

First Phase

Monitoring:

- Response Variables
- TN and TP
- Major Tributaries
- Upstream/Downstream Extent

Effluent Limits:

- Retain existing TN limits
- Implement New or more stringent TP limits

Special Conditions:

- Compliance Schedule, if appropriate
- Annual Reporting
- Optimization Efforts

Second Phase

Monitoring:

- Response Variables
- TN and TP
- Major Tributaries
- Upstream/Downstream Extent

Effluent Limits:

- Retain existing TN/TP limits
- Evaluate need for new or more stringent TP and/or TN limits

Special Conditions:

- Long-term Compliance Schedule for TN
- Update Watershed Inventory
- Engage Stakeholders
- Quantify other loads
- ID limiting nutrient
- Annual Reporting
- Optimization Efforts

Third Phase

Monitoring:

- Response Variables
- TN and TP
- Major Tributaries
- Upstream/Downstream Extent

Effluent Limits:

- Retain existing TN/TP limits

Special Conditions:

- Continue Long-term Compliance Schedule for TN
- Update Watershed Inventory
- Engage Stakeholders
- Quantify other loads
- ID limit nutrient
- Develop actions, implement, and assess reductions and health of watershed
- Annual Reporting
- Optimization Efforts

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PUBLIC COMMENT

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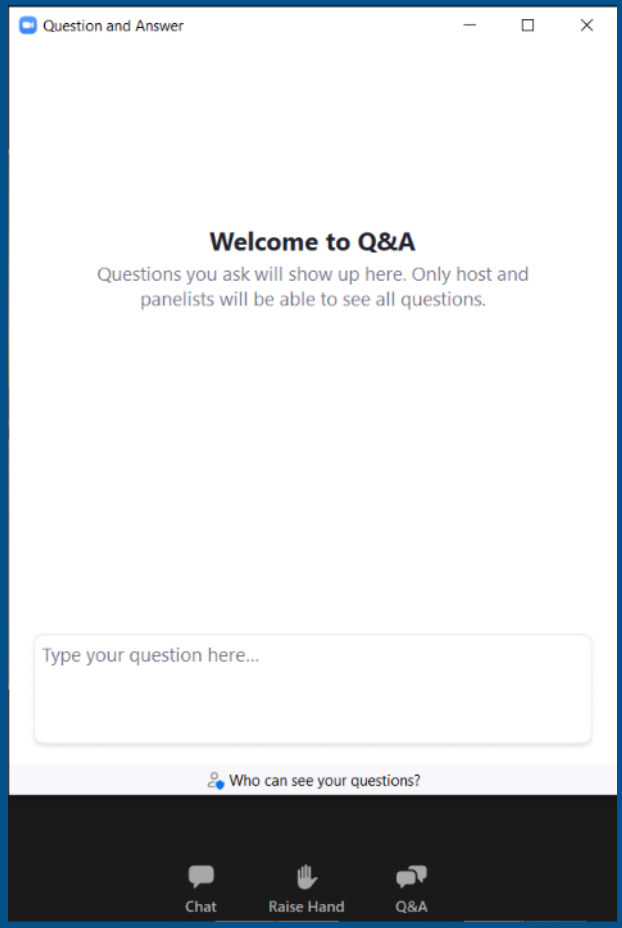
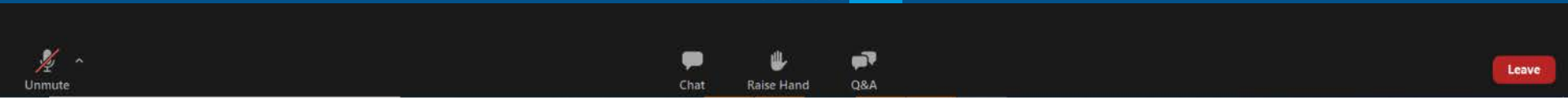
Questions/ Comments

- 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 Meeting

Next Meeting

- Wednesday, October 12, 2022, 9 – 11 a.m.

November Meeting Changes

- Wednesday, November 9 – Still scheduled
- Wednesday, November 23 – Cancelled due to holiday
- Wednesday, November 30 - NEW

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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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