



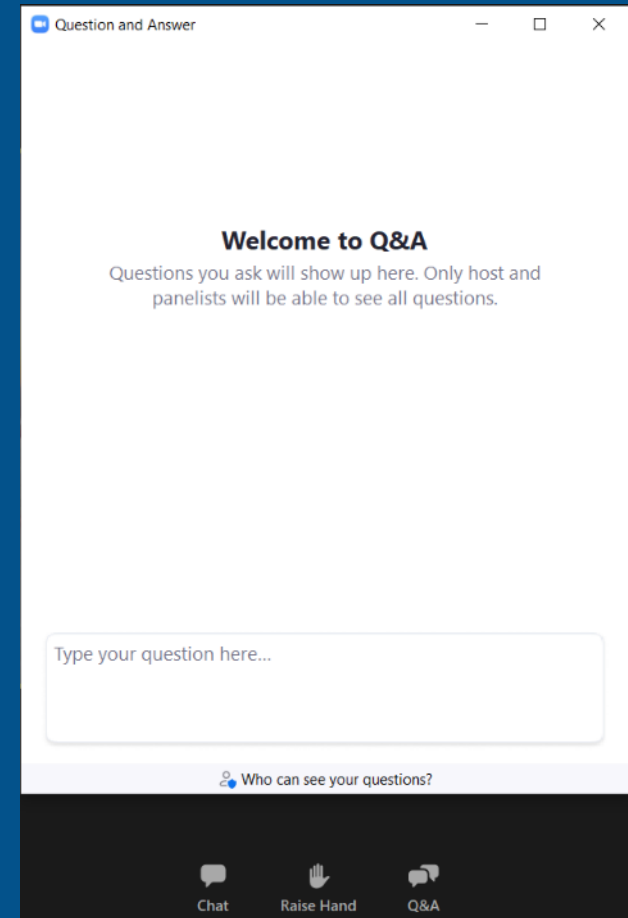
# Nutrient Work Group

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April 27, 2022

# 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



# Agenda

Meeting Goal: Discussion of crosswalk items and updated regulatory framework

## **Preliminaries**

- Nutrient Work Group Roll Call
- Changes in Soluble Nitrogen Loads Along the Yellowstone River

## **Discussion Document**

- Items 5a, 5c, 6/5b

## **Updated Regulatory Framework and AMP Process**

- Further Discussion on April 13 Framework Proposal
- Schedule

## **Public Comment & Close of Meeting**

- Public Comment
- Next Meeting

# Introductions

## Nutrient Work Group Members

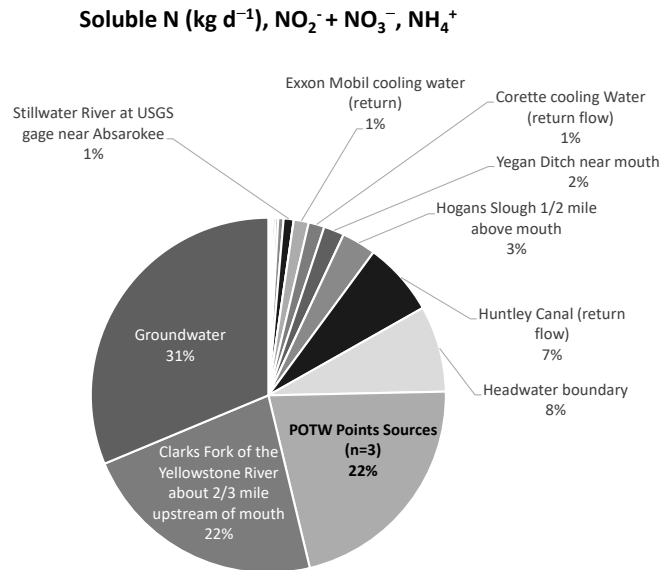
Interest Group	Representative	Substitute
Point Source Discharger: Large Municipal Systems (>1 MGD)	Louis Engels	
Point Source Discharger: Middle-Sized Mechanical Systems (<1 MGD)	Shannon Holmes	
Point Source Discharger: Small Municipal Systems with Lagoons	Rika Lashley	
Point Source Discharger: Non-POTW	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	

# Yellowstone River, Summer Low Flow

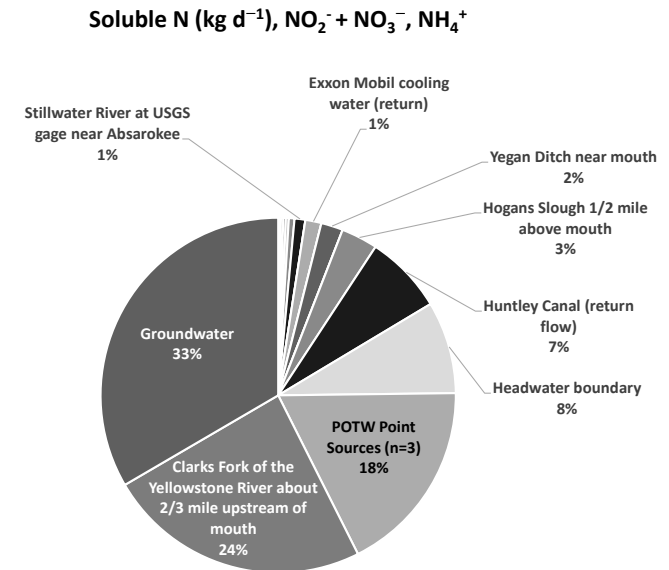
## Soluble Nitrogen: 2012 vs. 2022

Facility upgrades have slightly reduced POTW contributions of soluble N to the river\*

2012



2022



\*Yellowstone River from Livingston to the Big Horn River confluence.



# Discussion Document

# 4-5

## Crosswalk Between League's Proposed Discussion Outline and (1) the Framework Rule and (2) the 10/18/2021 Department Documents (Rule, Circular DEQ-15, Guidance).

Subjects in blue were added to the League's proposal and are subjects that DEQ needs to include and address.

League Topic	Short Description	Associated Section of Existing Documents				Associated Comment(s) on 10-18-2021 Drafts
		Framework Rule	10/18 Rule	Circular DEQ-15	Guidance	
4) Assessment of Treatment Options, Resulting Load Reductions, and Associated Cost	Each point source must provide information regarding current & potential treatment options, their potential load reductions, costs associated with different options, and feasibility	not addressed	New Rule X (4)(a)(i) and (iii) only address this indirectly.	Section 8.3.1	Sections 3.6.7 and 8.3.1.	<b>Adaptive</b> Management Program means (c) identifying and assigning treatment options to all dischargers in the watershed, considering the relative cost of their feasibility, and the expected water quality improvement, in determining whether to enforce such options or create voluntary incentives and programs for administration by DEQ (League, Industry).
5) Identify and Prioritize Actions for Nutrient Reduction in the Watershed						
5a	Collaboration between permittees, stakeholders, & DEQ to identify actions/tools to reduce watershed nutrients. DEQ to allow permit compliance flexibilities for experimentation with new technologies.	New Rule I (1)(a)(ii)(B) and maybe New Rule I (1)(d)	New Rule X (4)(a)(iii)	Section 8.2, Section 8.3.2	not addressed	<b>The</b> permittee has no authority to impose the monitoring plan or the implementation plan on anyone else, including other point and nonpoint sources. (Industry, Eng)
5b	Identify funding sources	not addressed	New Rule X (4)(a)(iv)	Section 8.4	Section 8.4 (placeholder section)	<b>New</b> Rule X(4)(a)(iv) requires demonstration of "the ability to fund and implement the plan," yet the permittee has no authority to implement anything beyond its discharge.
5c	Prioritize actions based on cost, feasibility, and degree of expected nutrient reduction	not addressed	not addressed	not addressed	not addressed	<b>Adaptive</b> Management Program means (c) identifying and assigning treatment options to all dischargers in the watershed, considering the relative cost of their feasibility, and the expected water quality improvement, in determining whether to enforce such options or create voluntary incentives and programs for administration by DEQ (League, Industry).
5d	Develop a schedule to implement actions and evaluate success of actions taken	Not addressed directly; New Rule I (1)(a)(ii)(B) is generally related	New Rule X (4)(a)(iii) and (v)	Section 4.5; Section 8.5	Section 4.5; Section 8.5; Appendix B	<b>The</b> document ...contains no discussion of implementation expectations, schedules, or roles. (League).
5e	Final plan submission to DEQ for review and approval; <b>how</b> plan is implemented in MPDES permit or TMDL	New Rule I (1)(b)	New Rule X (1) and (4)(b)	Section 1.0 Flowchart	not addressed	<b>The</b> AMP should be separate from the MPDES permitting process, but used to inform permit limits when appropriate, much like a TMDL. Keeping the AMP separate from the MPDES permitting process provides a path for watershed-specific science to be developed that can inform MPDES permits as appropriate, while recognizing and respecting the legal limits of the MPDES permitting program. Foisting watershed-scale requirements onto the permittee exceeds the authority of MPDES program (Industry). <b>The</b> absence of a similar table for permitting and the lack of information that describes how the state will consider the pollutants (i.e., TN and TP) for any reasonable potential analysis fails to provide an adequate level of assurance that MDEQ will identify protective levels of both TN and TP for implementation in NPDES permitting decisions.

**Crosswalk Between League's Proposed Discussion Outline and (1) the Framework Rule and (2) the 10/18/2021 Department Documents (Rule, Circular DEQ-15, Guidance).**

Subjects in blue were added to the League's proposal and are subjects that DEQ needs to include and address.

League Topic	Short Description	Associated Section of Existing Documents				Associated Comment(s) on 10-18-2021 Drafts
		Framework Rule	10/18 Rule	Circular DEQ-15	Guidance	
6) Secure Funding, Permits, Contracts and/or Other Requirements to Implement Actions	Identify multiple sources of funding to implement actions; DEQ supports coordination thereof	not addressed	New Rule X (4)(a)(iv)	Section 8.4	Section 8.4 (placeholder only)	<b>New</b> Rule X(4)(a)(iv) requires demonstration of "the ability to fund and implement the plan," yet the permittee has no authority to implement anything beyond its discharge.
7) Implement Adaptive Management Plan as Identified in Approved Workplan	Identify process to implement the AMP	New Rule I (1)(c)	New Rule X (2)(e) and (4)(d) (4d tangentially addresses this topic).	not addressed	not addressed	<b>Keeping</b> the AMP separate from the MPDES permitting process provides a path for watershed-specific science to be developed that can inform MPDES permits as appropriate (Industry)
8) Evaluate AMP Reduction Actions						
8a	Status update of implemented actions	not addressed	New Rule X (2)(f) and (4)(a)(v) and (4)(d)	Section 8.5	Section 8.5	
8b	Assessment of effectiveness of actions in the waterbody using applicable response variables	not addressed	New Rule X (4)(a)(v) and (6)(a)	Section 4.5; Section 8.5	Section 8.5	<b>EPA</b> is concerned that the thresholds proposed by MDEQ for many of the response variables are set at levels that reflect impact to or impairment of the designated use instead of protection of the use. (EPA).
8c	Feedback of evaluation findings to AMP plan	not addressed	New Rule X (4)(d)	Section 1.0 Flowchart; Section 8.5	Section 8.5	<b>Please</b> explain how the complex array of parameters and evaluations will be translated into requirement for the MPDES permittee.(LPD).
8d	Recommendations to the workplan, next year's actions	not addressed	New Rule X (4)(d)	Section 1.0 Flowchart; Section 8.5	Section 8.5	
<b>DEQ: Determine compliance with permit limits</b>	Details on how MPDES permit compliance is determined via response variables, nutrient concs., or both	<b>New Rule I(1)(b) and (c) generally address compliance within permits</b>	<b>New Rule X (6)(a)</b>	<b>Section 5.0</b>	<b>Section 5.0</b>	<b>Waiting</b> until response variables show a problem is reactive instead of proactive and violates CWA (EPA). <b>EPA</b> is also concerned that MDEQ's proposed approach will not comply with EPA's permitting regulations because it will not attain or maintain the applicable narrative water quality criteria, as required by 40 C.F.R. § 122.44(d)(1)(EPA). <b>Setting</b> water quality standards as threshold response variable is a flawed approach and counterproductive to protection of beneficial uses because detection over these thresholds has the potential to adversely affect beneficial uses and require reactionary mitigation rather than preventative action. (CDwest). <b>Please</b> explain the process for translation of narrative nutrient standards to numeric effluent limits. (LPD). Is the Department's emphasis on invertebrates and algae, or would it be better to portrayal maintenance of beneficial uses (recreation, water supply, habitat, etc)? (LPD). <b>New Rule X(6)</b> links compliance determinations to changes in the waterbody instead of to the characteristics of the waste that is discharged. Therefore, it is beyond the authority of the MPDES permitting program. (Industry)
<b>9) Watershed Progress Determination</b>	How to decide if impairment remains	not addressed	<b>New Rule X (4)(a)(v) and (4)(d) and (6)(a)</b>	<b>Section 5.0; Section 6.0</b>	<b>Section 5.0; Section 6.0</b>	<b>Any</b> existing determination of impaired or unimpaired conditions, permit limitations, or TMDLs derived under 2016 assessment methodology is not appropriate under the new adaptive management program framework and defeats the purpose and legislative intent of SB 358 (League). <b>The</b> new rule fails to "consider options pertaining to ... whether the receiving water body is considered impaired or unimpaired" as required by SB 358. This underscores the importance of the reassessing and/or validating previous assessments of waterbodies using a new, narrative nutrient standard. (Industry). <b>New Rule X(4)(a)(v)</b> allows continually expanding and never-ending monitoring without consideration of the relative benefits of such monitoring. It sets in motion a research project not commensurate with the requirements or authority of the MPDES permitting program.



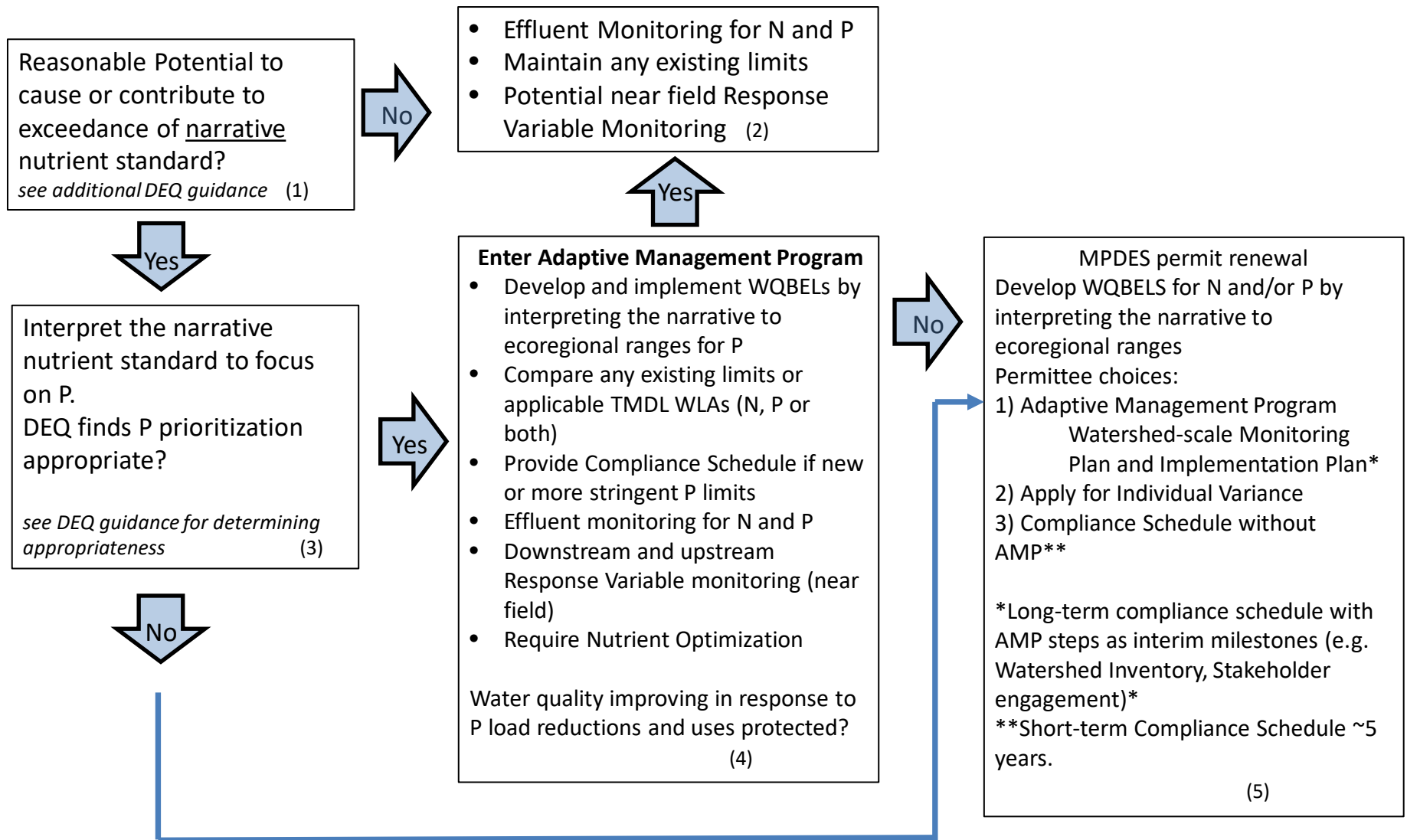


# DEQ's Proposal for an Updated Regulatory Framework

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April 13, 2022

# Permitting Process for Publicly-owned Mechanical Facilities



# Qualitative Reasonable Potential for Narrative Water Quality Standards

## 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

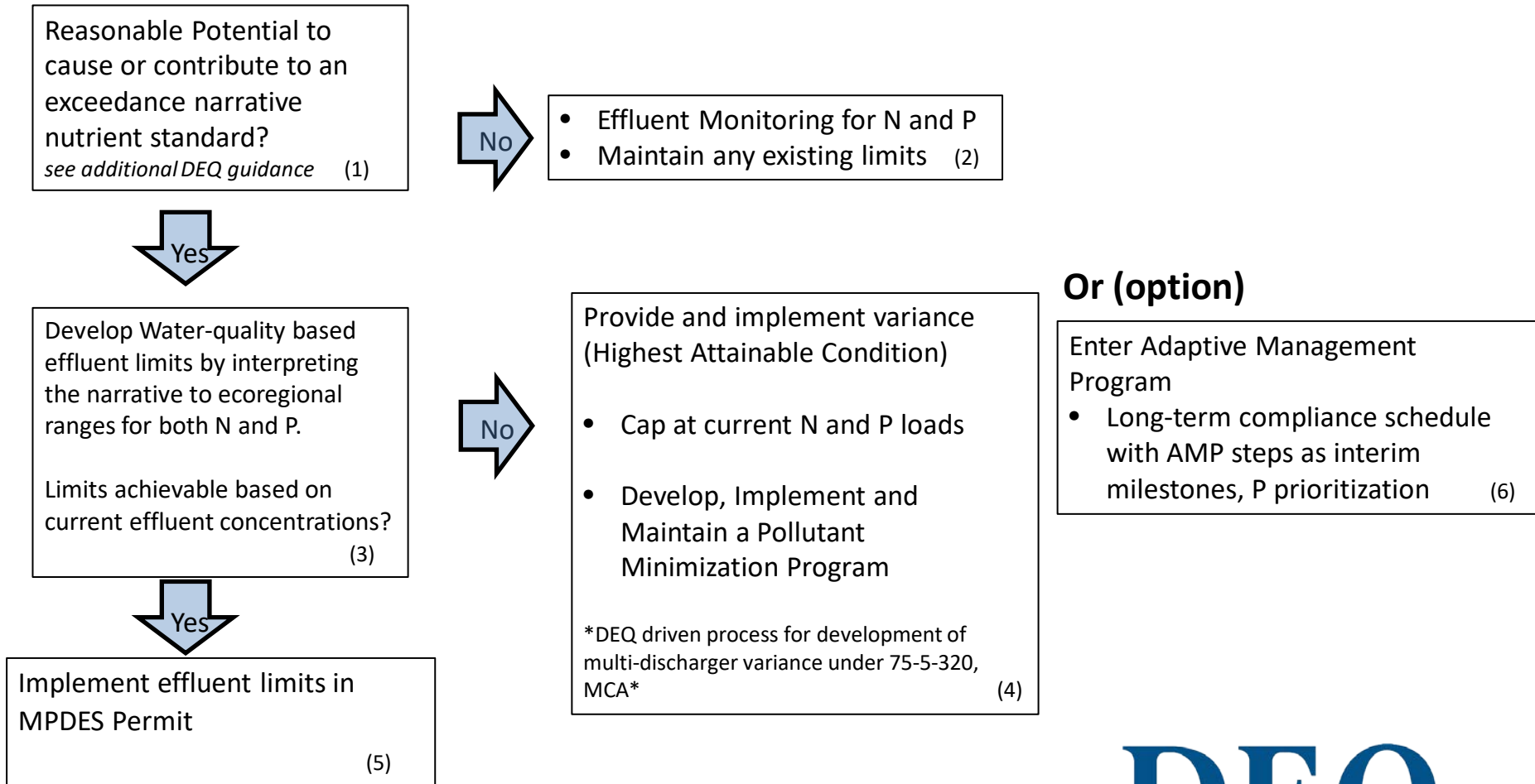
- Type of facility and treatment
- Upgrades and age of treatment
- Effluent concentrations
- Optimization work undertaken
- Compliance history
- Compliance inspections—notes, O&M deficiencies, neglected infrastructure

## Pollutant Characteristics

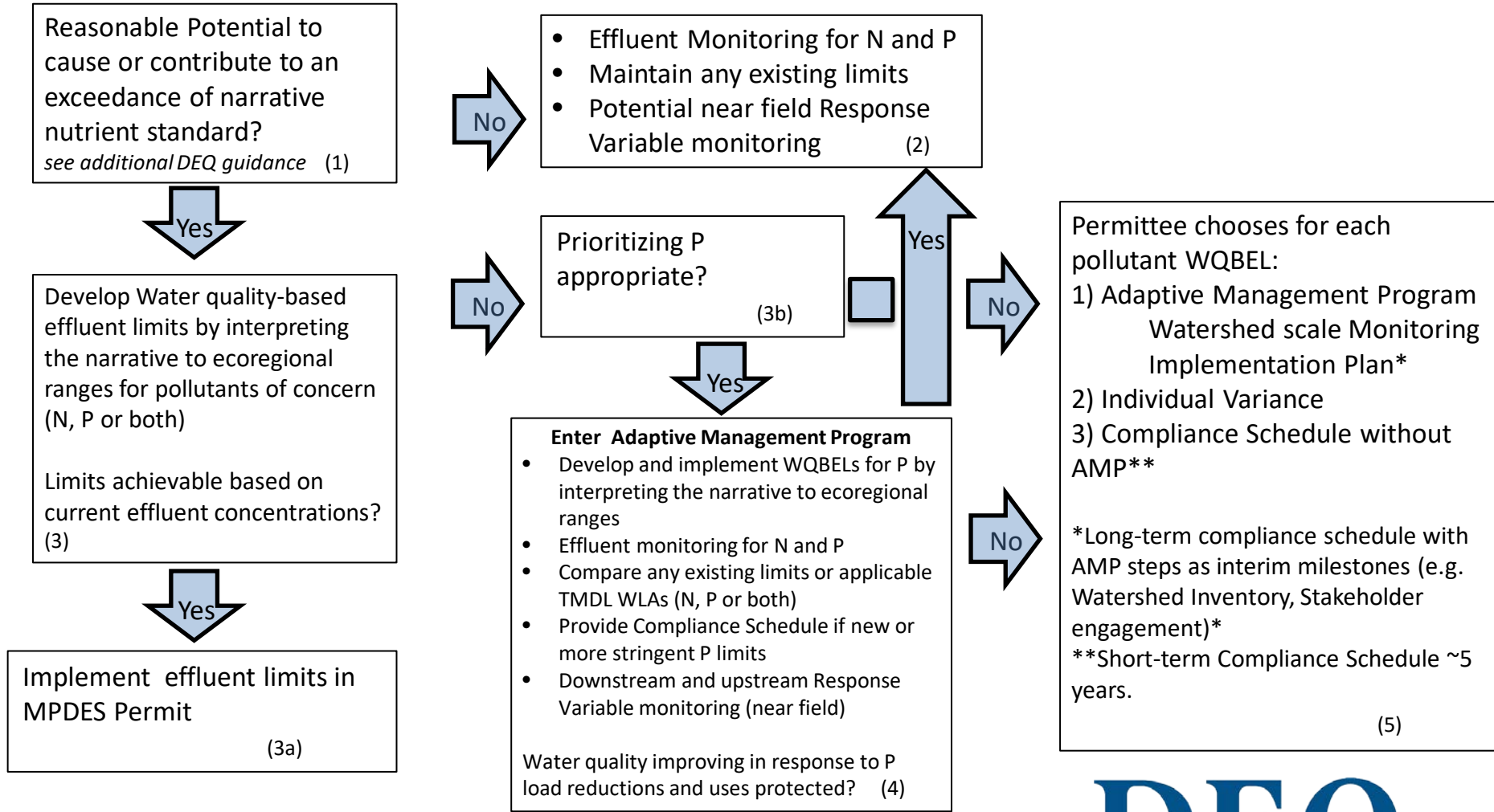
- Environmental fate/persistence

ARM 17.30.1344 and 40 CFR 122.44

# Permitting Process for Publicly-owned Lagoons



# Permitting Process for Industrial Facilities



# 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 <sup>b</sup>	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 <sup>c</sup>	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) <sup>a</sup>	20 - 41 <sup>d</sup>	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

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

<sup>b</sup> Based on the 25<sup>th</sup> and 75<sup>th</sup> percentiles of the natural background concentrations in this level IV ecoregion.

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

<sup>d</sup> 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

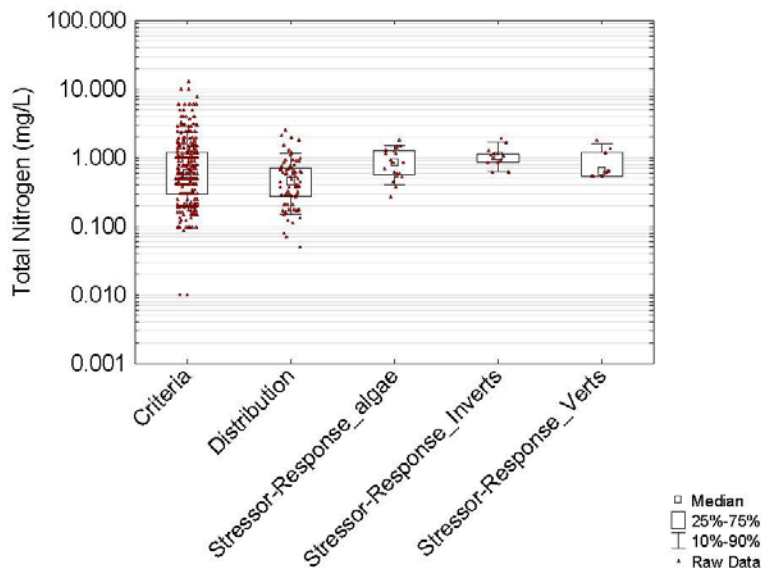
# Across the US, protective TP criteria are in a fairly narrow concentration range



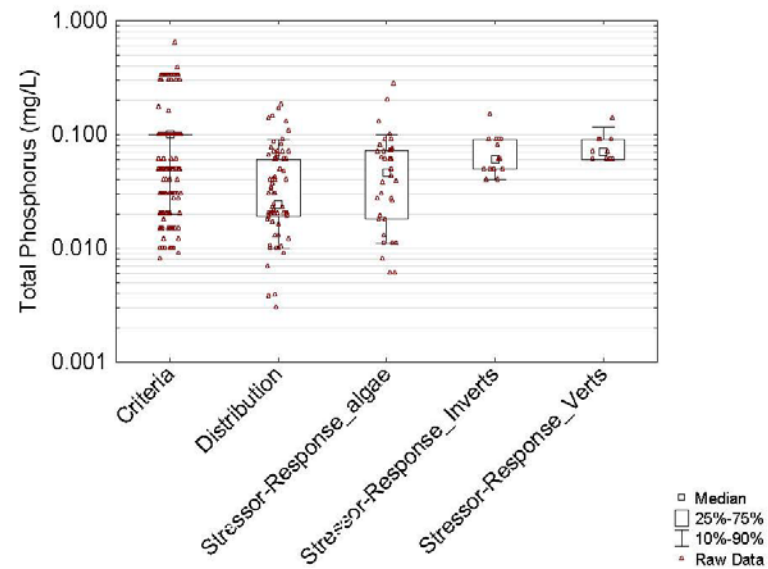
## Results: Published Studies in Streams

- Across the United States
- For Streams: 90% of values where impacts occur very by less than a factor of 10

Total Nitrogen: 0.20 to 1.1 mg/L



Total Phosphorus: 0.01 to 0.10 mg/L



# Potential for Point-Nonpoint Nutrient Trading

*Morrison-Maierle and Kieser & Associates (2014)*

Overall Conclusion: “There appears to be a relatively limited number of potential PS/NPS trading opportunities in Montana.”

- 27 PS facilities had some potential for trade
  - 14 appear to have demand, supply and economic conditions that may lead them to consider trading for TN
  - Zero facilities had the potential for economically viable TP trading
  - Major limitation on Montana trading potential is “due to very low rainfall during the critical months of July to September (typically < 2 inches) when instream nutrient standards must be met.”



# Clark Fork River: 1 wastewater upgrade brought 33% reduction in basin phosphorus

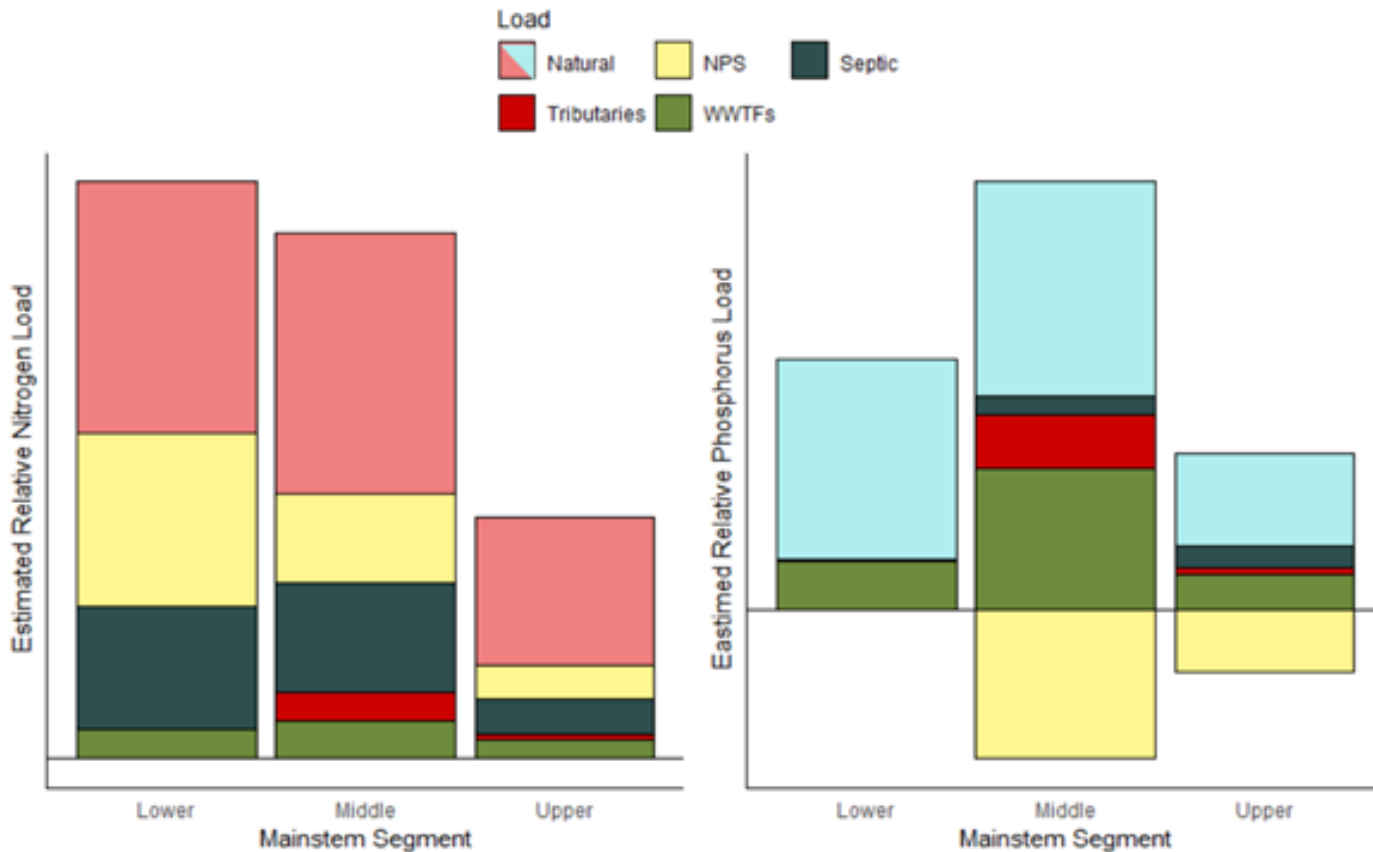
TABLE 1. Actions Taken to Remove Nutrients from the Clark Fork River and Their Effectiveness Over the Period 1989-2005.				
Nutrient Source	Action Taken	Sampling Site Immediately Below Action	Approximate Load Reduction Realized as of 2005 (kg/day)	
			TN	TP
Butte wastewater facility*	Constructed stormwater detention basins to reduce stormwater overflow to the sanitary sewers; reduced industrial loads; grew sod with effluent in summer. (Note: new membrane bioreactor facility planned to be operational by 2015.)	7	-54	7
Deer Lodge wastewater facility	Replaced old leaking sewer lines; developed a land application system for effluent to reduce direct July-September discharge to the river to zero (Note: reductions occurred only up to 2008, since facility returned temporarily to direct discharge in 2008.)	10	11	2
Missoula County	Connected thousands of existing home septic systems to the central sewer	18	35	1
Missoula wastewater facility	Upgraded and expanded the facility to biological nutrient removal (BNR; operational late 2004)	18	273	76
Smurfit-Stone Container Corporation	Reduced nutrient additions to treatment systems; no direct discharge to river July-Aug (used storage ponds)	22	97	22
Basin wide	Phosphate laundry detergent ban enacted in 1989	all sites	0	121
		Total load reduction to river (kg/day):	361	230

\* Butte's nitrogen load *increased* over this time, so shown as negative.

From Suplee *et al.* (2012)<sup>13</sup>

# Bitterroot River: In 2022, WWTFs are the major anthropogenic total P source

The largest source of nutrients overall comes from natural background sources of nutrients, which is reasonably expected because the Bitterroot River is not impaired by nutrients.



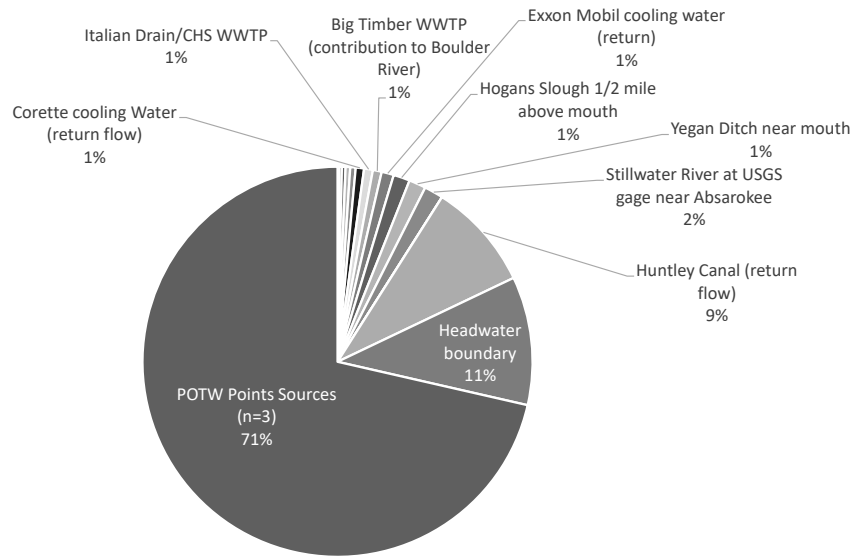
From: DEQ (2022). Draft Bitterroot River Nutrient Protection Plan.

# Yellowstone River, Summer Low Flow 2012

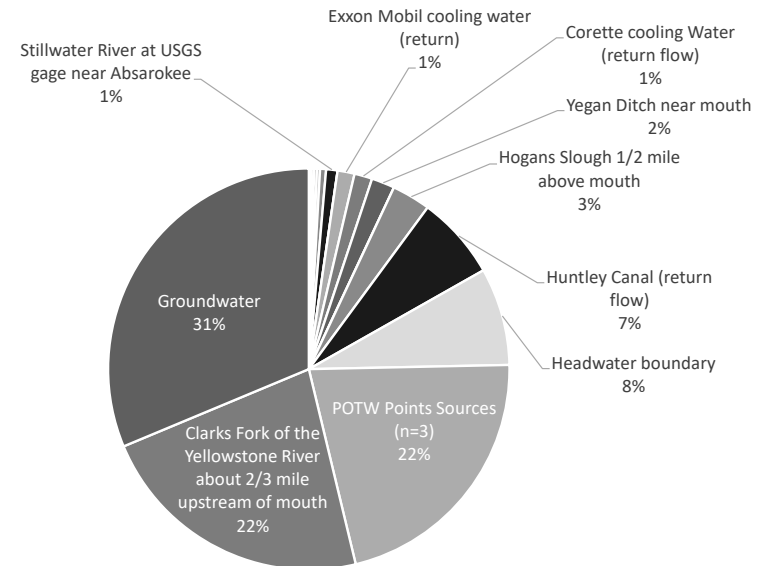
Three point sources were 71% of the daily SRP load\*. Facility upgrades have since occurred on all three (2022 conditions next slide).

Soluble nitrogen sources more dispersed (three point sources were 22%; less today).

**2012: Soluble P (kg d<sup>-1</sup>)**



**Soluble N (kg d<sup>-1</sup>), NO<sub>2</sub>+NO<sub>3</sub><sup>2-</sup>, NH<sub>4</sub><sup>+</sup>**



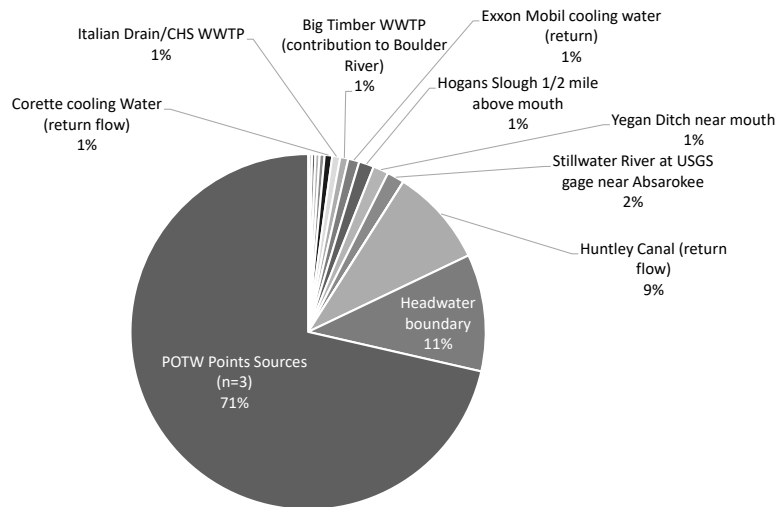
\*Yellowstone River from Livingston to the Big Horn River confluence.

# Yellowstone River, Summer Low Flow

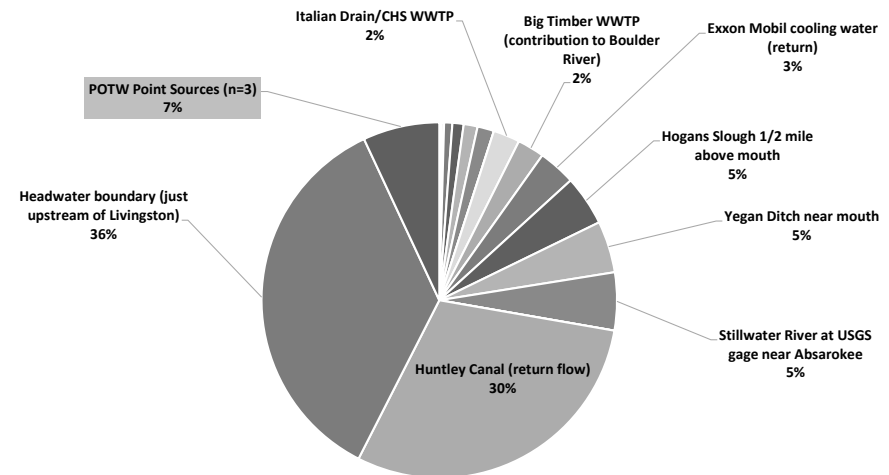
## SRP: 2012 vs. 2022

Facility upgrades have greatly reduced POTW contributions of SRP to the river\*

2012: Low Flow Soluble P ( $\text{kg d}^{-1}$ )



2022: Low Flow soluble P ( $\text{kg d}^{-1}$ )



\*Yellowstone River from Livingston to the Big Horn River confluence.



# Questions / Discussion

# Additional Items

- Schedule for Updated Rule
- Monitoring Needs
- Next Meetings:
  - May 11
  - May 25
- Additional Meeting Options
  - May 18, 9-11 a.m.
  - June 1, 8-10 a.m.

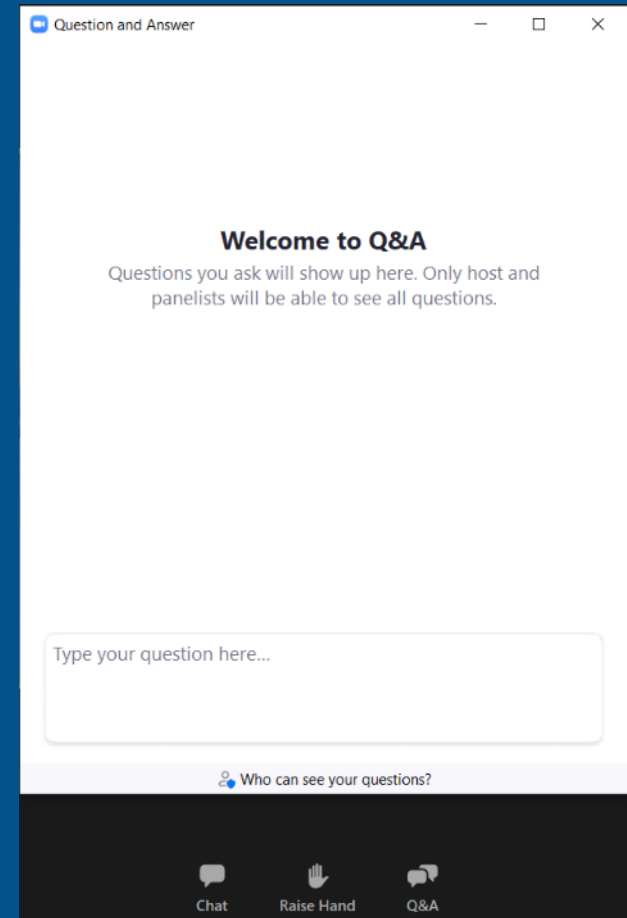




# PUBLIC COMMENT

# 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



Question and Answer

**Welcome to Q&A**

Questions you ask will show up here. Only host and panelists will be able to see all questions.

Type your question here...

Who can see your questions?

Chat Raise Hand Q&A

Unmute

Chat

Raise Hand

Q&A

Leave



# Next Meeting

- Next Meeting:  
May 11, 2022 at 9 a.m.



# Thanks for Joining Us

Contact:  
Christina Staten  
[CStaten@mt.gov](mailto:CStaten@mt.gov)

To submit comments or questions



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

