#### NUTRIENT WORK GROUP MEETING SUMMARY SEPTEMBER 7, 2021

#### 1:30 p.m. Hybrid Meeting: Zoom and DEQ Room 111

#### ATTENDANCE: NUTRIENT WORK GROUP MEMBERS

Representative & Affiliation	Representing
Susie Turner	Point Source Discharger: Large Municipal
City of Kalispell	Systems (>1 MGD)
Shannon Holmes	Point Source Discharger: Middle-Sized
City of Livingston	Mechanical Systems (<1 MGD)
Rika Lashley	Point Source Discharger: Small Municipal
Morrison-Maeirle	Systems with Lagoons
Alan Olson	Point Source Discharger: Non-POTW
Montana Petroleum Association	
Kelly Lynch	Municipalities
Montana League of Cities and Towns	
Tammy Johnson	Mining
Montana Mining Association	
John Youngberg	Farming-Oriented Agriculture
Montana Farm Bureau	
Jay Bodner	Livestock-Oriented Agriculture
Montana Stockgrowers Association	
Haylie Brown (sub. for Kristin Gardner)	Conservation Organization: Local
Clearwater Resource Council	
Sarah Zuzulock	Conservation Organization: Regional
Zuzulock Environmental Services	
David Brooks	Conservation Organization: Statewide
Montana Trout Unlimited	
Guy Alsentzer	Environmental Advocacy Organization
Upper Missouri Waterkeeper	
Guy Alsentzer (sub. for Wade Fellin)	Water or Fishing-Based Recreation
Upper Missouri Waterkeeper	
Andy Efta	Federal Land Management Agencies
U.S. Forest Service, Northern Region	
Tina Laidlaw	Federal Regulatory Agencies
U.S. Environmental Protection Agency	
Mike Anderson (sub. for Jeff Schmalenberg)	State Land Management Agencies
MT Dept. of Natural Resources and Conservation	
Samantha Tappenbeck	Soil and Water Conservation Districts –
Flathead Conservation District	West of the Continental Divide

Representative & Affiliation	Representing
Dan Rostad	Soil and Water Conservation Districts – East
Yellowstone Conservation District Council	of the Continental Divide
Julia Altemus	Timber Industry
Montana Wood Products Association	

#### NOT IN ATTENDANCE: NUTRIENT WORK GROUP MEMBERS

Representative & Affiliation	Representing
Pete Schade	County Water Quality Districts or Planning
Lewis and Clark County Water Quality Protection	Departments
District	
Scott Buecker	Wastewater Engineering Firms
AE2S	

#### **ATTENDANCE: OTHER PARTICIPANTS**

Aaron Losing, City of Kalispell
Alan Olson, Montana Petroleum Association
Amanda McInnis
Amelia Flanery, DEQ, Surface Water Discharge Permitting
Amy Steinmetz, DEQ, Water Quality Division Administrator
Bill Andrene, City of Butte
Brian Balmer, USFWS
Brian Heaston, City of Bozeman
Carl Sundstrom
Christina Staten, DEQ, Watershed Protection Section
Christine Weaver, DEQ, Surface Water Discharger Permitting
Coralynn Revis, HDR
Cori Hach
Darrin Kron, DEQ, Monitoring and Assessment Section Supervisor
Darryl Barton, DEQ, Compliance and Technical Assistance Section Supervisor
David Clark, HDR
David Galt, Montana Petroleum Association
Ed Coleman, City of Helena
Elena Evans, Missoula Valley Water Quality District
Eric Regensburger, DEQ, Water Quality Standards and Modeling Section
Eric Trum, DEQ, Watershed Protection Section
Erik Makus, EPA Region 8
Galen Steffens, DEQ, Water Quality Planning Bureau Chief
George Mathieus, DEQ, Deputy Director
Griffin Nielsen, City of Bozeman
Haley Sir, DEQ, Surface Water Discharge Permitting
Hannah New, DEQ, Surface Water Discharger Permitting
Hannah Riedl, DEQ, Watershed Protection Section
Heather Henry, DEQ, Surface Water Discharge Permitting
Heather McDowell, Sibanye Stillwater
Jane Madison, DEQ. Water Quality Standards and Modeling Section

Jason Mohr, Legislative Environmental Policy Office Jeff Dunn, WGM Group Jeff May, DEQ, Surface Water Discharge Permitting Jeramy Thompson, City of Sidney Joanna McLaughlin, DEQ, Surface Water Discharger Permitting Joe Dauner, Calumet Montana Refinery Joe Lierow, ExxonMobil Billings Refinery Jon Kenning, DEQ, Water Protection Bureau Chief Josh Viall, DEQ, Compliance and Technical Assistance Section Katie Makarowski, DEQ, QA/QC Officer Kayla Glossner, DEQ, Surface Water Discharge Permitting Kristi Kline, Montana Rural Water Systems Kristy Fortman, DEQ, Watershed Protection Section Supervisor Kurt Moser, DEQ, Legal Counsel Logan McInnis, City of Missoula Loren Franklin, KC Harvey Environmental Lou Volpe, DEQ, Watershed Protection Section Louis Engels, City of Billings Mark Ockey, DEQ, Watershed Protection Section Matt Wolfe, Sibanye Stillwater Maya Rao, DEQ, Surface Water Discharge Permitting Michael Kasch, HDR Mike Suplee, DEQ, Water Quality Standards and Modeling Section Moira Davin, DEQ, Public Information Officer Myla Kelly, DEQ, Water Quality Standards and Modeling Section Supervisor Pat Cunneen, City of Butte Paul Skubinna, City of Great Falls Peggy Trenk, Treasure State Resources Association Rebecca Harbage, DEQ, Public Information Officer Rainie DeVaney, DEQ, Surface Water Discharge Permitting Section Supervisor **Rickey Schultz, HDR Robin Richards** Ron Kuhler, ExxonMobil Billings Refinery Ryan Leland, City of Helena Ryan Sudbury, City of Missoula Shane LaCasse, CHS Ted Barber, Meeting facilitator Tom Osborne, Stillwater-Rosebud Water Quality Initiative Vicki Watson, University of Montana Watershed Clinic

#### **MEETING INITIATION**

Ted Barber, meeting facilitator, welcomed everyone to the meeting just after 1:30 p.m. and went over meeting logistics. Ted took a roll call of Nutrient Work Group members present either via Zoom or in Room 111 of the DEQ Metcalf Building in Helena. Ted then handed the meeting over to Kelly Lynch, Municipalities representative, who thanked DEQ for the opportunity to present.

#### **PRESENTATION BY MUNICIPALITIES AND POINT SOURCE DISCHARGERS**

See **Attachment A** for the presentation slides. Kelly went over the presentation outline and then turned it over to Bill Andrene, Superintendent of the Butte Silver Bow Wastewater Treatment Plant (WWTP). Bill gave a brief look into Butte Silver Bow's efforts to reduce nutrients discharged to Silver Bow Creek. A new treatment process was brought online in 2016, which Bill stated removes 96% of nutrients. Capital costs associated with the upgrade totaled \$35 million, with an additional \$700,000 per year in operation and maintenance (O&M) costs. There has been continued reductions in nitrogen as the new process has been optimized. Bill then turned it over to Pat Cunneen to talk about the water quality of Silver Bow Creek. Pat showed graphs demonstrating decreasing nutrient concentrations downstream of the wastewater plant's outfall. Pat then discussed seasonal fish monitoring conducted by Montana Fish, Wildlife and Parks and showed a bar graph of fish counts. He stated that fish populations have declined and do no reflect the fact that nutrients concentrations have decreased. Pat believes Silver Bow Creek is being influenced by other factors, such as stormwater and stream temperature.

Rika Lashley, representative for small point source dischargers, then discussed efforts by the City of Deer Lodge to reduce nutrients to the Clark Fork River. Like the Butte Silver Bow WWTP, Rika stated that Deer Lodge was part of the Voluntary Nutrient Reduction Plan that was published by DEQ in 1998, which established nutrient TMDLs for the Clark Fork River and assigned a wasteload allocation of 0 to the Deer Lodge wastewater treatment plant. The idea was that Deer Lodge would land apply all their effluent; however, they have never been able to secure enough land to do so. Therefore, they invested in an activated sludge treatment plant to remove nutrients, upgrading from a four-cell aerated lagoon. Rika stated that Deer Lodge contends with high inflow and infiltration (I&I) rates, which makes treatment ineffective due to dilution. Capital costs associated with the upgrade totaled \$17 million, with an additional \$200,000 per year in O&M costs. Compliance with the TMDL wasteload allocation of 0 has proved impossible and other ways to reduce nutrients will have to be looked for, as further treatment is very costly for little gain. Additionally, a decreasing rate payer base makes additional financial investments difficult.

Paul Skubinna, Public Works Director for the City of Great Falls, then discussed efforts at the Great Falls WWTP, which discharges to the Missouri River. Paul stated that there is no numeric nutrient criteria for the Missouri River and the segment to which they discharge is not listed as impaired for nutrients. Great Falls operated a basic activated sludge plant with secondary settling. An upgrade was completed in 2016 for \$16 million to a three-stage MLE plant. The new plant achieves approximately 77% removal of total nitrogen (TN) and 85% removal of total phosphorus (TP). In 2017, Great Falls began establishing working relationships with local watershed stakeholders (Sun River Watershed Group and local conservation districts) and conducted optimizations in 2019 and 2020. Great Falls is currently evaluating financial options for a future \$65 million upgrade to biological nutrient removal. Paul then discussed water quality monitoring on the Missouri River and stated they are unable to find a statistical difference in TN and TP data upstream and downstream of the facility. Paul then showed pictures taken two weeks ago along the banks of the river and noted that anecdotally they are not seeing a significant response in algae. Paul then discussed nutrient impacts upstream and downstream of Great Falls and guestioned whether septic systems and a downstream fish hatchery impact nutrients in the river. Paul concluded by stating that their plant is getting pretty good nutrient removal and they are yet to see a notable impact to the Missouri River, and that collaboration is the best next step in an adaptive management program.

Susie Turner, Public Works Director for the City of Kalispell and large point source dischargers representative, gave an overview of Kalispell's efforts to improve water quality in Ashley Creek, a

western Montana wadeable stream to which they discharge. Susie stated that Kalispell has a 36-year history in treatment and water quality improvements. In response to a 2001 TMDL document produced by DEQ for Flathead Lake, which included a 25% reduction goal for TP, the city invested \$24 million to reduce TN and TP, which was paid for by rate payers. Kalispell then could not achieve the nutrient criteria that was added to their permit and applied for a variance and conducted optimization efforts. Kalispell is currently conducting site-specific sampling and conceptual modeling to look at an alternative analysis to correctly classify Ashley Creek, which has thus far cost \$500,000. Susie stated this effort has been very collaborative with DEQ and their ultimate goal is to have a scientifically based understanding of Ashley Creek and to be held to applicable nutrient criteria. Susie then stated that even if Kalispell were to move to the next phase of treatment, those investments will not meet the water quality goal for Ashley Creek or Flathead Lake and will create a hardship on rate payers. This will push development into unincorporated areas, which isn't smart growth. To conclude her talk, Susie stated that many TMDLs are outdated, cities have made great investments in response to TMDLs, and a one size fits all approach should not be used. A well laid out AMP process can address this issue, as cities want to make sure investments are a benefit to water quality and won't place extreme costs on rate payers that won't improve water quality.

Louis Engels with the City of Billings Water Reclamation Facility discussed the wastewater process for Billings, which discharges to the Yellowstone River. His slide in the presentation shows a football field, with the discharge of the Yellowstone River (approximately 106-foot pool of water over a football field every hour) and the discharge of the reclamation facility (approximately 2 feet of water over a football field every hour) overlain for scale. Louis stated that if Billings wanted to go to the next level of treatment (0.5 pounds of phosphorus and 20 pounds of nitrogen), this would double the energy load required, and chemicals would increase, as well as time and money. If the city went to reverse osmosis, 20% of the water would have to be disposed of elsewhere (injection wells, for example), which is a consideration to weigh. Louis concluded by saying that now is the opportunity to look at the watershedscale and other areas where we can improve water quality and we need to be cognizant of what the impacts will be if we upgrade the treatment plant.

Amanda McInnis, the technical representative for municipalities, then discussed a common goal of supporting beneficial uses. She stated that a simple dose-response relationship does not exist for nutrients; the relationship is complicated due to other things going on in the watershed, including habitat issues, stream geometry, flow alterations (a wet vs. dry year or irrigation withdrawals), shade or lack thereof, temperature, and climate change. If we simply focus on nutrients and try to control eutrophication without understanding this, we won't be moving toward supporting beneficial uses. This is not a challenge that is unique to Montana; across the country, point sources and regulating agencies are challenged to handle this. Amanda then discussed how other EPA Region 8 states are doing things that could help, including the use of technology based effluent limits (TBELs) applied as an annual median or annual average value. The state of Utah for example has delayed implementation of nitrogen, and there are incentives for early compliance. The slide in **Attachment A** titled "Region 8 Eutrophication Regulation Status" lays out various standards and limits in place across the region.

Dave Clark, technical representative for large point source dischargers, went over a revised version of the AMP flowchart that was submitted to DEQ in June and provided to the Nutrient Work Group (see **Attachment A**). Dave stated this revision to the flowchart adds realism and more details and incorporates feedback loops to recognize this is an iterative process. He stated there is a potential for an AMP to be developed by a third party and the idea of a conceptual watershed approach or model as a framework to guide the process (that mimics the process taking place on Ashley Creek). The "Schedule &

Timeframes" slide lays out that this is not a linear process and shows timeframes and task responsibilities. The following slides break down each portion of, or block of time in, the AMP process, beginning with a watershed assessment and ending with annual reporting that will support the entire process and keep track of trends. Dave then discussed the idea of a conceptual watershed model (see **Attachment A**). This slide shows stressors of what may impact the watershed across the top, and the body of the diagram shows causal pathways and impacts to beneficial uses. Biological responses are shown horizontally on the bottom.

Dave then discussed effluent limits in an Adaptive Management Plan and stated that it should be recognized that it may not be possible to begin an AMP by knowing what the final inputs of nutrients should be, as this will evolve over time. He stated that it may be infeasible to identify numerical effluent limits in the interim. There can be non-numeric limits in permits: narrative effluent limits based on best management practices (BMPs). Dave concluded by stating the AMP is the best management approach.

Amanda explained what the municipalities and point source dischargers think the AMP framework should look like. She took DEQ's slide of "Example Permit Conditions Through Time" presented at the August 25 Nutrient Work Group meeting and overlaid blue boxes to show what they think makes sense (see **Attachment A**). A main change is that rather than including response variables in an MPDES permit, they would only be included in the adaptive management plan that is referenced in the permit. Another difference is the consideration of examining whether a waterbody's classification is appropriate at the start of the process, as well as reviewing impairment determinations. The first phase of the process would also include development of a conceptual watershed model. Amanda stated that if utilities have made big investments, and further investments don't make a material difference, this question should be asked at the beginning of the process. The next slide "Key Decision Points" was also revised from DEQ's August 25 Nutrient Work Group meeting presentation. The main change is that reasonable potential analysis is removed from the MPDES permitting process and replaced with "additional actions developed in the AMP." Amanda stated that all the permit will do is reference the AMP. She further stated that if at the end of the process, you've done everything you can do and the stream still doesn't support its beneficial uses, you need to look at stream reclassification.

Amanda then discussed the nexus between TMDLs and adaptive management plans. She stated that several TMDLs in Montana have wasteload allocations based on old numeric values, and that EPA supported the idea of adaptive management planning as a TMDL, which she referred to as an alt-5 TMDL. She said we also heard Wisconsin talk about this in their August 30 presentation. Amanda stated that it's critical to get this nexus fixed and accurate. There is precedent in the MS4 permitting process for moving response variables into TMDLs.

In closing, Amanda stated that driving development out into counties is an unintended consequence and the framework they have proposed is the best framework to implement Senate Bill 358 and an adaptive management program.

#### Discussion

Mike Suplee, Water Quality Science Specialist for DEQ, stated that looking over the process, he didn't recall seeing a part in the flowchart where a decision gets made as to whether the narrative nutrient standard is attained or not attained. This was a critical part of the flow chart that DEQ put together. Dave Clark responded that they weren't explicit as to what point this occurs. Their flow chart is more vague because they think this is a process that continues and the key is to prioritize management

actions. Mike responded that everyone would agree it would be wise that if a watershed was concluded to be in good health and no additional work is needed, a POTW would want to know that relatively soon. In DEQ's system, they (the point source in the healthy watershed) just go into a monitoring feedback loop. Dave responded that this is a good comment and maybe you shift to sampling every couple of years depending on the conditions.

Tina Laidlaw, federal regulatory agencies representative, thanked the presenters for sharing great examples. She also stated she would like to highlight that there are other tools that could be helpful such as variances or site-specific criteria. To address Amanda's points, Tina wanted to remind everyone that Wisconsin has numeric nutrient criteria and variances and to enter the AMP process in Wisconsin, you have to have greater than 50% of your phosphorus load coming from nonpoint sources. Tina then stated she was confused over what will be in a permit limit – just the BMPs? Amanda responded that you could have permit language that references the AMP and the BMPs therein – a lot like a MS4 permit. Amanda also stated you could also pull specific actions from the AMP and make them a specific compliance schedule within a permit – could be done either way.

Vicki Watson stated in the Zoom chat box "Very informative presentations -- but will take a while to absorb all that information. The proposed process looks a lot like the TMDL process in many respects. If the numeric standard is replaced by a narrative standard -- will that narrative standard include avoiding degradation from the reference conditions in each ecoregion? Since that was part of developing the numeric standards for each ecoregion. Will the narrative standard allow degradation from the reference condition down to the point where everyone agrees there is a problem?" Amanda responded that this is a good point. The AMP process is set up well to address that concern. It allows all that other conversation along with a whole suite of other considerations. So would we expect degradation below the reference condition? I think we move the focus to supporting the beneficial uses and that's what the AMP is about – supporting the beneficial uses. The numeric values are part of that conversation. The AMPs are not developed in a vacuum; they are public documents done in a stakeholder environment. Dave then stated that this is a challenging question. The way the program addresses it allows us to better understand whether numeric concentration values are attainable or actually necessary. Not sure we can answer the question about degradation past the reference condition.

Guy Alsentzer, environmental advocacy organization representative, stated he is uncertain on relating to the regulatory context we're working on. He doesn't see how we reconcile EPA rules about antidegradation with this approach. This doesn't jive with the Clean Water Act regulatory structure. He also wanted to echo Tina's comments about the broader context. We need to have a truly watershed-based approach. Montana is pretty remedial when it comes to looking holistically on how we're going to have regulatory controls over other sources. If we want to give Senate Bill 358 a chance, there needs to be other tools in the toolbox – like exercising DEQ regulations over septics and better wetland protections. Things that can be explored and verified. Guy also said we need a broader conversation about other tools that are enforceable.

Mike Suplee then asked Amanda's opinion on the minimum watershed site sampling structure that DEQ proposed (including far field sites, are tributary sites necessary, etc.). What are her thoughts on this? Amanda responded that she liked the idea of logical upstream and downstream of POTWs and key tributaries. She further stated the regulatory point is actually the downstream terminus of the HUC unit, however. Some AMPs could have multiple compliance points because they have multiple HUCs. Bigger

dischargers will be fine with a bigger sample size and we probably need something more modest for smaller dischargers – haven't really through this through.

Tina Laidlaw then stated she was curious about their thoughts on the proposed response variables and thresholds. Amanda responded she does think some receiving waters have not been classified correctly from the beginning, so maybe the classification on the books is not accurate, but this is the minority of waterbodies. The bed rock of the process goes back to beneficial uses and the beginning step should be revisiting the beneficial uses. The response variables are not black and white. If we have 125 mg/m<sup>2</sup> as a seasonal average, what if it's 124 or 126? That's not that black and white of a situation and is why we think those kinds of analysis should be done in the AMP. Tina then asked if revisiting the beneficial uses involves collecting data. Amanda responded that you can do a Google Earth use attainability analysis (UAA) in these watersheds pretty quickly - a perfunctory analysis in the beginning. You can see the discord right from the beginning for those waterbodies that are misclassified and can do a one paragraph Google Earth snapshot. Tina followed-up with the statement that EPA would have some thoughts on what would be required for a UAA. Dave Clark added that the ideas about classification may evolve through the AMP process where we learn over time and are better informed as to whether the classification is appropriate and whether beneficial uses can be attained. Dave also stated that a UAA is not a trivial undertaking, and you need a fair amount of maturation of process to support a UAA.

Dave further stated that the way Mike presented things was useful in a conceptual watershed model as a guideline in assessment. However, it is problematic if trying to connect numerically to effluent limits. Questions about spatial and temporal exceedances come into play. We shouldn't be applying these upstream and downstream of a point source discharge. We need to look at allowable spatial and temporal exceedances and whether or not we're achieving support of the beneficial uses through the impaired segment – not a concentration of TN and TP and not a bright line concentration of chlorophyll a benthic algae.

Paul Skubinna wrote in the chat box "On behalf of Great Falls we are interested in seeing a relatively specific concept of what the AMP should look like, similar to what was presented today, from other stakeholders." He further stated that perhaps we can find common ground from other presentations.

Kristy Fortman, Supervisor of DEQ's Watershed Protection Section, stated she heard an emphasis put on addressing nonpoint sources throughout watersheds, which she thought was great. She further stated that she was curious to see if they had thoughts about where the additional funding would come from for those processes. The Wisconsin presentation detailed out that the permittees pay for the projects. Amanda responded that this is the 64 thousand dollar question, and the one thing she liked about Wisconsin is that they have a separate nutrient reduction grant program that prioritized grant dollars based on dollars per pound of nitrogen or phosphorus. She said she liked the structure that you get the most bang for those nonpoint dollars, but thinks that's a separate state-funded program and she didn't have great solutions as to who pays. Dave Clark stated that USDA provides a number of assistance programs through NRCS and things can be done by leveraging other funding sources that go beyond Clean Water Act funds. Kristy responded that Montana has a resource grant working group that includes the NRCS and the state uses the group to stretch out dollars as much as possible.

Kelly Lynch stated in the chat box "To Kristy's point, I think the municipalities think this could vary widely based on the watershed covered in the AMP. Who are the stakeholders? What resources do they bring to the table? Where can state and local resources be prioritized within an AMP and across AMPs in the state? The AMP process will allow us to better target those actions that will give us the best, quickest

results statewide." Kristy responded verbally that several of our watersheds that have TMDLs also have a watershed restoration plan (WRP) that details out this information. WRPs often don't include point sources, so this is where they could get in.

Vicki Watson stated in the chat box "Just FYI -- the numeric standards for benthic chlorophyll were correlated with river users view of whether beneficial uses (recreation) were being supported -- and this was published in a peer reviewed paper by Mike Suplee."

Christine Weaver, a DEQ surface water permit writer, wrote in the chat box "As a permit writer, I am trying to envision how we would permit the "now" protection vs the long-term continuous improvement protection that might be possible through the AMP. One slide earlier mentioned state(s) use of TBELs for point source TN/TP limits. Would cities and towns be supportive of limits similar to the old Circular 12-B HAC limits, as TBELs?" Note that HAC stands for highest attainable condition. Amanda McInnis responded that this is a good comment, and they need to think about that a little.

#### **RULE VS GUIDANCE DOCUMENT**

Mike Suplee gave an overview of what will be contained in rule versus a guidance document. He stated that rules are things that have the force of law – typically adopted in the Administrative Rules of Montana (ARM) or in a circular. Circulars are referenced in the ARMs and they too have the force of law. Both are public noticed and go through a public comment period. DEQ responds to public comments and then adopts the rules and circular. In contrast, guidance is not in rule, does not require a public hearing, and changes to those documents can be made in the document and recorded in the document's history. Guidance documents contain a history table at the front that details the different versions and what was modified through time. Guidance documents do not have to go through rulemaking.

Example of a rule would be: When an AMP monitoring plan is submitted to DEQ, at a minimum, it shall include "a watershed that is defined, at a minimum, by its upstream extent, its downstream extent, the principal tributaries if any need to be included, and the main sampling location to be monitored for the purposes of assessing sources and the direct effects of the point source." This statement lays out what sites would be needed at a minimum but doesn't say how to locate them. The guidance document that would be associated with this part of the rule would provide additional detail on this. The department has a spreadsheet available to provide the distance estimates, and the guidance would also recommend what to look for when carrying a site reconnaissance. All those latter things are guidance – they all basically back up and support the rule which says you have to have sites and take a look at these things.

#### Discussion

Rika Lashley asked why the guidance document has to be done at the same time as the rule language, given that we have so little time. Mike Suplee responded that the devil is in the details. There are certain aspects of this work that the guidance document can point to that we already use. The chlorophyll-a SOP, etc., for example. If we point to a requirement in the rule but no one has any idea how we're going to do it, that tends to lead to problems. The guidance document could be developed later, but in this case, there are strong feelings that we should get all things developed largely at the same time.

Tina Laidlaw asked if DEQ is including the response variables and thresholds in rule or guidance. Mike responded that those will be in the Circular, and therefore, in rule. But the process by which you collect that data will be in guidance.

George Mathieus, DEQ Deputy Director, stated that he's willing to be persuaded otherwise, but we have to put a package together that EPA approves and understands how we're going to protect water quality and beneficial uses. If there's another way to do it, which is part of the reason EPA is involved in this dialog, I'm all ears.

Rika Lashley asked if there's any way to leave a back door open in the rule. We all agree we don't have enough time to do this. Not a back door to water things down. Is there a way to revisit things or improve them in the future? How much does the rule nail us down? Mike Suplee responded that the guidance document isn't strictly part of the rule package. The rule package contains the rule itself and the Circular and those need to be finalized once we submit them. If want to change those documents after that, we have to go through this rulemaking process all over again. A guidance document, however, could be changed next month.

Kelly stated in the chat "I have mentioned this before, but I still think there is a process for us to adopt an AMP framework to meet the March 1 deadline in SB 358, but follow it up with continued work of this group to develop a full detailed rule package for the implementation of the AMP that could be submitted to EPA for approval. The March 1 deadline is not an EPA deadline." Kelly then verbally stated that she's trying to make the point that March 1 is not EPA's deadline to submit a rule package to them for approval. We could get to the intent of Senate Bill 358 by adopting something by rule that is more of a higher level framework for what we want to see and continue in the following months to come up with a detailed rule package that fills in what we want to see. Amy Steinmetz, DEQ's Water Quality Division Administrator, responded that the first step would have to be extremely vague and where does that get us? Amy then asked Kelly to clarify what she sees the first step looking like. Kelly responded that by March 1, we have to adopt a rule that provides for the development of an AMP. We could get to that point with a very high level framework of how we'll be developing an AMP framework. George Mathieus responded that he sees what Kelly is getting at. However, how do we run a permitting program in the meantime? Kelly responded that she doesn't see it as any different between now and March 1 – continue to do what you're doing now. George followed up by asking Tina's thoughts on that. George further stated that to him, we're sort of in a holding pattern right now. Part of Senate Bill 358 requires us to repeal Circular DEQ 12-A. Once we repeal, where are we without a well laid out definitive program? Kelly responded that she doesn't think that 358 requires you to repeal by March 1.

Ed Coleman with the City of Helena wrote in the chat box "Is there a ballpark estimate as to when the draft rule, guidance, circular will be ready for public dissemination?" Mike Suplee responded that the plan is to have something ready by the end of September for internal review and then get something for people to look at in the early part of October.

#### **PUBLIC COMMENT**

Public comment was taken during the meeting and is incorporated into the "Discussion" sections above. Time was also taken at the end of the meeting for additional public comment, but none was received.

#### **CLOSE OF MEETING**

The next Nutrient Work Group meeting is scheduled for September 22 from 9 to 11 a.m. A listening session is also scheduled for September 23 from 1 to 3 p.m.

#### SUMMARY OF ACTION ITEMS

As Nutrient Work Group and Technical Subcommittee meetings have been combined, the action items below now contain those from both previous Nutrient Work Group meetings and Technical Subcommittee meetings. All noted in progress or pending Technical Subcommittee responsibilities now fall to the Nutrient Work Group. No new action items were recorded in this meeting.

In-F	In-Progress Action Items					
#	Action	Who	Status			
1	Update the AMP flowchart and supporting materials based on	DEQ	In progress			
	TSC feedback					
2	Define what P prioritization means	DEQ and TSC	Pending			
3	Define roles and responsibilities of DEQ and permittees for AMP	DEQ	In progress			
	process					
4	Identify and define what is needed to determine how far	TSC	In progress			
	upstream and downstream monitoring should occur for a point					
	source					
5	Put together case study of what DEQ thinks is a reasonable	DEQ	In Progress			
	minimum of data collection for large rivers					
6	Provide documents in advance of NWG meetings	DEQ	Ongoing			
7	Add timeframes to the Adaptive Management Program flowchart	DEQ and TSC	Ongoing			
8	Summarize SOPs for sampling nutrients	DEQ	Ongoing			

Cor	Complete Action Items					
#	Action	Who	Status			
1	Distribute the flowchart and supporting materials to the TSC in a format to provide comments/track changes	Rainie DeVaney, Mike	Complete			
		Suplee				
2	Consider other measures that may trigger action (Box 7 of flowchart)	TSC	Complete			
3	Clarify in the supporting documents that the narrative standards	Rainie	Complete			
	are those referenced in the Administrative Rules of the Montana	DeVaney, Mike				
	of the State of Montana.	Suplee				
4	Define the overall work for the AMP by the June 23 Nutrient	TSC	Complete			
	Work Group meeting					
5	Provide information to the TSC on how to get on the agenda for a	Rainie	Complete			
	future meeting	DeVaney, Mike				
		Suplee				
6	Schedule two TSC meetings between each Nutrient Work Group	Rainie	Complete			
		Devaney, Mike				
		Suplee				
7	Set up Teams TSC collaboration site. Send invite email. Post	Moira Davin,	Complete			
	comments received from TSC members and draft DEQ documents	Christina				
		Staten				

Con	nplete Action Items		
#	Action	Who	Status
8	Update AMP definition based on TSC feedback. Share out to TSC.	Rainie	Complete
		DeVaney, Mike	
		Suplee	
9	Decide whether medium sized rivers should be broken out	TSC	Complete
10	Add the draft approach for determining watersheds to Teams for feedback from TSC	Mike Suplee	Complete
11	Reorganize technical subcommittee Teams folders so they are	DEQ	Complete
	more intuitive		
12	Receive written comments from League of Cities and Towns	Amanda	Complete
		McInnis	
13	Medium rivers definition	Mike Suplee	Complete
14	Create bibliography of nutrient-related literature	DEQ	Complete
15	Provide feedback from the TSC about the time component in the	TSC	Complete
	flow chart		
16	Receive feedback from TSC on time component of each flowchart	TSC	Complete
	step.		
17	Get Microsoft Teams up and running for NWG and TSC members	DEQ	Complete
18	Address the question of nonpoint source participation in the AMP	DEQ, NWG	Complete
	process		
19	Consensus opinion of farming and nonpoint source community on	Nonpoint	Comment
	this process and what they think is possible or realistic	source	noted
		representatives	
20	Create responsibility chart for adaptive management program	DEQ and TSC	Complete
21	Summarize the process for determining a wadeable stream vs	DEQ	Complete
	large river		
22	Add groundwater to the adaptive management program	DEQ and TSC	Complete
	framework		
23	Provide copy of EPA action letter on Utah's headwater streams	DEQ	Complete

Questions/Topics Flagged for Future Discussions	Meeting
	Date
Tina asked when will the Monitoring Plan be submitted (is that part of the permitting	6/10/21
application)? When will the public get to review what is being proposed for monitoring?	
Will DEQ have monitoring guidance?	
How exactly the public process is incorporated into the different steps in the AMP need to	6/10/21
be worked out and flagged that for future discussion.	
Consider developing a case study to guide the MT process.	6/10/21
Tina noted, there is talk about doing some downstream analysis, but it could also be that	6/10/21
elevated concentrations of nutrients could contribute to an issue that just hasn't yet been	
manifested, so EPA will be curious how the state plans to address that piece.	
Discussion on the nexus between TMDLs and AMPs.	6/10/21
Tina asked where does the NPDES permit application process fit in to this whole process?	6/10/21
Define roles and responsibilities of DEQ and permittees in AMP process	6/21/21

Questions/Topics Flagged for Future Discussions	Meeting
	Date
How will DEQ apply existing TMDLs- what is the interplay of AMPs and	6/21/21
completed/approved AMPs	
Define P prioritization and what is intended as site-specific factors.	6/21/21

#### ATTACHMENT A: SEPTEMBER 7, 2021 NUTRIENT WORK GROUP MEETING PRESENTATION SLIDES



**POTW's** Proposed **AMP** Framework for Montana

City of Billings' Water Reclamation Facility's recent \$75M upgrade

## Agenda

- Cities' work on improving surface water quality
- Cost-benefit analysis
- Common goal supporting beneficial uses
- Region 8 States' approaches to interim limits
- Adaptive Management Plan flow charts
- Alt 5 TMDLs

### Silver Bow Creek and Butte WWTP 1998 to present

1998 VNRP and nutrient TMDL		2012-2015 Design of Butte WWTP Upgrade		2016 Completion of Butte MBR (limits of technology nutrient removal)		
	2005-2011 Planning for Butte WWTP Upgrade		2014 New Upper Clark Fork Nutrient TMDL (upstream of Deer Lodge)	k 1	Ongoing Stream Monitoring in Silver Bow Creek	







- <u>Capital</u> costs associated with upgrades for nutrient removal and better treatment in general:
  - \$35,000,000
- <u>Additional O&M Costs for higher level treatment:</u>
  - \$700,000 per year (total \$4.2M)

### **Effluent TN**





Blue-green – Old Process Yellow-red – New Process

### Nutrient Load to Silver Bow Creek pounds per day (milligrams per liter)

	Total Nitrogen	Total Phosphorous
Old Process, 2001-2015 Avg.	626 lb/d (17 mg/L)	57 lb/d (1.8 mg/L)
New, no chemical addition, 2016-2017 Avg.	91lb/d (3.0 mg/L)	10 lb/d (0.3 mg/L)
New, process optimization, 2018-2019 Avg.	68 lb/d (1.94 mg/L)	4.7 lb/d (0.14 mg/L)
New, with chemical addition, 2020-2021Avg.	27 lb/ d (1.42 mg/ L)	0.74 lb/ d (0.03 mg/ L)

# Silver Bow Creek - Decreasing nutrient concentrations downstream of plant outfall...



## ... No increased fish population since 2010

#### Silver Bow Creek @ Rocker



Brook Trout Cutthroat Trout

## Upper Clark Fork River and Deer Lodge Lagoon/WWTP - 1998 to present



## **Deer Lodge Previous Treatment Process**

### Population: ~3,150

Number of Operators: 1 (also public works director)



## Deer Lodge 2017 WWTP



- Population: ~2,900
- Number of Operators: 2 (public works superintendent plus backup)
  - Bio-N removal (target effluent 8 mg/L)
  - Chemical P-removal (target effluent 0.8 mg/L)
  - Ongoing efforts to reduce infiltration will further improve WWTP nutrient removal

## Costs

- <u>Capital</u> costs associated with upgrades for nutrient removal and better treatment in general:
  - \$17,000,000
- <u>Additional O&M</u> Costs for higher level treatment with nutrient removal:
  - \$200,000 per year (total of \$300,000)

## **Further Reductions?**

- Compliance with existing zero WLA has proved impossible
  - Sufficient land for land application could never be secured
  - Further reducing effluent nutrients is very costly for little gain
  - Decreasing rate payer base makes additional financial investments very costly
- More data is needed
  - Identify non-point nutrient sources
  - Identify best strategy for reducing nutrient sources with greatest impact

## **Great Falls WWTP**



## **Missouri River**

Large River, numeric criteria were not developed

Sampling in 2012, model not completed, complicated by dam and upstream impacts

B-2 water of the state

Not listed as impaired for nutrients in the stretch where the City discharges



### Great Falls Facility Improvements & Missouri River Water Quality - 2000 to Present

303(d) Impairment Listings Sun and other segments of Missouri		2010 Facility Plan and Mixing Zone Study	,	2012 – 20 Construct 3-Stage M Upgrad	016 ion ILE e	2018 Updated Facilities Master Pla	E fir E	2015 - Present valuating CIP and nancial options for future \$65M Biological Nutrient Removal (BNR)
	•	•	$\bullet$	$\bullet$	lacksquare	lacksquare		•
	Pre 2000 Basic Secondary Treatment		2012 Wastewater Facility Upgrade Design	е	2017 Bega establishing w relationships local waters stakeholde	an orking with hed ers	2019-20 Bega installing nutrie treatment optimization instrumentatio	an ent



D.... 0000









### **Circa 2000 Great Falls WWTP Facility**

**Basic Secondary** Treatment 10.5 MGD **Effluent Quality** Phosphorus 5 mg/L Nitrogen 25 mg/L



## **Missouri River TMDL Status**

Location	Miles	Causes of Impairment	Probable Sources
Headwaters To Toston Dam	22	Arsenic, Nitrogen, Sedimentation	Agriculture, Municipal WW, Natural
Toston Dam To Canyon Ferry Reservoir	22.6	Cadmium, Copper, Lead, Sediment	Agriculture, Resource
Holter Dam To Little Prickly Pear Creek	2.8	Nitrogen, Phosphorous, Sediment	Agriculture, Hydromod, <b>Municipal WW</b> , Natural
Little Prickly Pear Creek To Sheep Creek	20.9	Arsenic, <b>Nitrogen</b> , Sediment	Agriculture, Hydromod, Natural
Sheep Creek To Sun River	65.3	Sediment	Agriculture, Hydromod, Urban Storm, Natural
Sun River To Rainbow Dam	7	Chromium, Mercury, PCBs, Sediment, Selenium, Solids, Turbidity	Legacy, Hydromod, Industrial, Urban Storm, Agriculture
Rainbow Dam To Morony Dam	9.1	Arsenic, Copper, PCBs, Sediment, Temp, Turbidity	Legacy, Hydromos, Resource, Industrial, Natural
Morony Dam To Marias River	54.6	Aluminum, Arsenic, Cadmium, Chlorophyll, Copper, Iron, Lead, <b>Nitrogen, Phosphorous</b> , Sediment, Zinc	Agriculture, Hydromod, Industrial
(Sun) Muddy Creek to Mouth		Nitrogen, Phosphorus, Sediment, Total Suspended Solids, Other flow alterations	Agriculture, Irrigated Crop Production, Rangeland Grazing, Channelization

### **Great Falls Biological Nitrogen Removal Upgrade**

- \$16M upgrade
- MLE Nitrogen Removal Process with bonus phosphorus removal
- 13.3 MGD
- Typical TN 8 mg/L 77% Removal Typical TP – 0.5 mg/L 85% Removal



## What it takes to do "more"

Nutrient treatment upgrades done *before* permit required

BNR = \$65 M (in prepandemic 2018 \$'s)



## **Great Falls Post Upgrade Monitoring**

- Gathering monthly samples for nutrients
- Upstream to Downstream monitoring not statistically significant



### **Visual on Response Variables**





## **Upstream Activities**

### Potentially harmful blue-green algae reported in Helena reservoirs, officials say

Tom Kuglin Aug 15, 2018 Updated Aug 20, 2018 🔍 0



## **Missouri River Impacts**

### • Septics

Hardy Creek to Craig – relatively high density housing on septics
 Impaired Reach = Prickly Pear to Sheep Creek

• Helena Valley septics

Impaired Reach = Holter to Prickly Pear?

#### Fish Hatchery and Ag Impaired Reach = Morony to Marias?

### Improvements

Craig and Wolf Creek now have package plants
 Both paid for improvements with resort taxes

## **Sun River Impacts**

 Impaired for TN and TP at the confluence with Missouri

Agriculture,
 Irrigated Crops,
 Grazing

 Small PS dischargers?



## Summary

% point source removal without permit requirement

Discharge doesn't seem to impact the Missouri River

What next investment makes the most sense?

Impacts for other pollution sources nearby?

Collaboration

- Sun River Watershed Group
- Cascade Conservation District
- Cascade County



## Kalispell's Efforts to Improve Water Quality in Ashley Creek



### Kalispell Facility Improvements & Ashley Creek Water Quality: 1980s to Present



### Ashley Creek is <u>NOT</u> a Typical Western MT Wadeable Stream



Natural Characteristics: No gravel or potential for gravel recruitment Low gradient and "U" shaped channel form Very low flows in late summer and early fall Backwater from Flathead River in lower reaches





## **Award Winning Treatment Facility**

- Two National 1<sup>st</sup> Place
   U.S EPA Clean Water
   Act Recognition
   Awards
- Advanced Nutrient Removal (Modified Johannesburg Process)
- Effluent Quality
  - Phosphorus = 0.13 mg/L
    - ~ 97% Reduction
  - Nitrogen = 7.7 mg/L
     ~ 83% Reduction





### Summary

- TMDLs have not considered improvements in water quality that have already occurred
- Important reductions in NPS loading have not occurred and should be addressed in the AMP
- General response/thresholds benchmarks for waterbodies should not be used when
  not applicable
- Significant investments already made to reduce PS nutrient loading to Ashley Creek



## **Common Goal – Supporting Beneficial Uses**

- Nutrients do not have direct toxic effects (like metals/arsenic)
- Simple dose-response relationships do not exist for nutrients
- Relationship between nutrients and biology is complicated:
  - Habitat issues (IBI)
  - Stream geometry (depth, width, shape, slope, bed, banks)
  - Flow alteration (dewatered for irrigation?)
  - Light penetration (canopy)
  - Temperature
  - Climate change

Simply reducing nutrients, without addressing these other issues, will not move toward supporting beneficial uses of our water bodies.

## **Region 8 Approaches to Interim Values**

- Use Technology Based Effluent Limits (TBEL)
- Annual Median or Annual Average values for application to TBEL
- Delayed implementation of Nitrogen
- Incentives for early compliance



# TBELs and incentives can be options for the glide path to water quality standards

## **Region 8 Eutrophication Regulation Status**

### Colorado

- Chla standards
- Interim TBELs at 15 mg/L TIN, 1 mg/L TP
- Numeric standards set for 2027
- Incentive program for early removal

### Utah

- \* "Start with P, Interim N Reductions Later"
- \* 1 mg/L Total P Technology Based Effluent Limit
- Percent cover rather than algae density

### Wyoming/North Dakota/South Dakota

- WY-Working on an interpretation of the narrative standard for streams and lakes
- ND-Working on an interpretation of the narrative for lakes/reservoirs
- SD-specific regions have a clhl-a based approved for lakes/reservoirs



## **AMP Flowsheet**

- Suggested improvement considerations
- Additional details to further define the process
- Feedback loops for modifications/updates
  - More realistically portray the iterative AMP process that incorporates mid-course adjustment and continues over an extended period of time (multiple permit cycles)
- Broader responsibilities for a SB358 Balanced Watershed Approach
- Potential for AMP prepared by Permittees, or DEQ, or an AMP Developer working on behalf of a group of stakeholders
- Conceptual Watershed Approach
   Guideline for AMP development



### Schedule & Timeframes

- Years 0 to 2: Initiate AMP Process
- Years 3 to 5: Engagement, Monitoring, Reporting
- Years 2 to 5 Beyond: Prioritize Management Actions, Implementation, Feedback, Reprioritize

#### GENERAL SCHEDULE: Year 0 DEQ's Adaptive Management Program Year O Start or Update Adaptive Management Program for [NAME] Watershed Year 0 to 2 Assessment of [NAME] Watershed Nutrients Year 0 to 2 Assessment of [NAME] Watershed Nonpoint Sources Year 0 to 2 Permittee's Assessment of Nutrient Loading and Reduction Ability Year 3 Permittee AMP Participation and Compliance Justification Year 3 DEO Approves Permittee's AMP Compliance Justification

Year 3

and Throughout Year 3 to 5

and Throughout

Year 0 Start or Update Sampling Analysis Plan and Throughout Year 0 Implement Sampling Analysis Plan and Throughout Year 3 and Annual Watershed Report and Update Watershed AMP Assessment Annually Afterward Year 2 Watershed Nutrient and AMP Progress Determination and Biennially Year 2 and DEQ Determines Water Achieves WQS and Approves Baseline Monitoring Annually Afterward Vear 3 and Prioritize Actions for Points and Nonpoint Source Reductions Annually Afterward Year 4 and Secure Funding, Permits, Contracts and/or Other Requirements to Implement Actions Annually Afterward Year 4 and Implement AMP Reduction Actions Annually Afterward Year 5 and Evaluate AMP Reduction Actions Annually Afterward

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Engage Stakeholders and Start or Update Workplan for Watershed AMP

Start or Update Conceptual Watershed Framework for AMP

LEGEND: DEQ Program Action Permitte Action Group DEQ/Permittee/Other Action DEO Action

AMP Developer (likely Permittee or group of Permittees) Action

 Action or Step --- Informs Adaptive or Update Step; Potentionally Repeating

### Years 0 to 2: Initiate AMP Process

- Watershed Assessment
- Loading Analysis
- Permittee
   Participation
  - Justification
  - DEQ Approval
- ID Stakeholders
  - Feed Forward



### Years 3 to 5: Engagement, Monitoring, Reporting

- Engage Stakeholders
- Conceptual Watershed Approach
- Monitoring Feedback 0 Adjustments
- Annual Reporting

Year 2 and Biennially Year 2 and Annually Afterward

Year 3

Year 3

Year 3 to 5

Year O

Year O

Year 3 and



### Years 2 to 5 Beyond: Prioritize Management Actions, Implementation, Feedback, Re-prioritize

• Candidate

#### **Management Actions**

Point Source

- Nonpoint Source
- Funding

   ID Sources & Pursue
- Implementation
  - Prioritization
  - Trends Analysis
  - Evaluate AMP
  - Feedback
  - Re-prioritize
- Annual Reporting



### **Conceptual Watershed Model**



### **Effluent Limits in AMP**

- AMP process evolves over time
  - Near term definition of numerical effluent limits infeasible
    - Existing permits vary: no effluent nutrient limits, existing effluent limits, administratively extended
- NPDES limits may be expressed as numeric or non-numeric discharge requirements
  - Federal regulations authorize non-numeric effluent limits in lieu of numeric limits where "Numeric effluent limitations are infeasible." 40 CFR 122.44(k)(3)
- Non-numeric effluent limits based on Best Management Practices (BMP)
  - $\circ$  AMP = BMP

### Proposed AMP Implementation

Conceptual Watershed Model Development

#### First Phase

Monitoring:

- Response Variables
- TN and TP
- Major Tributaries
- Upstream/Downstream Extent
- Retain Existing TN/TP Approach
- Reference AMP for BMPs

AMP

-

-

Special Conditions:

- Watershed Inventory
- · Annual Reporting
- Optimization Efforts

-Review beneficial use classification -Review impairment/assessment -Response Variables Determine if PS makes a material difference in response variables-if so enter Detailed AMP

#### **Second Phase**

#### Monitoring:

- Response Variables
- TN and TP
- Major Tributaries
- Upstream/Downstream Extent
- -Retain Existing TN/TP Approach, if appropriate -Reference AMP for BMPs -AMP
- Special Conditions:
  - Update Watershed Inventory
- Engage Stakeholders
- Quantify other loads
- ID limiting nutrient
- Annual Reporting
- Optimization Efforts
- -Response variables review
- -Conceptual Watershed Model review/update

#### **Third Phase**

#### Monitoring:

- Response Variables
- TN and TP
- Major Tributaries
- Upstream/Downstream Extent
- -Retain Existing TN/TP Approach, if appropriate -Reference AMP for BMPs

#### Special Conditions:

- 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
- -Response variables review
- -Conceptual Watershed Model review/update

### **Key Decision Points**



## **Adaptive Management Plan/TMDL Nexus**

- How to reconcile TMDLs based on numeric values with new AMPs
- Consider alternative/iterative TMDL approaches
- EPA supported this idea in 2016 memo, also in Wisconsin
- Moving the response variable analysis into the AMP/TMDL has precedent and allows broader analysis than a permitting framework

## Closing

- Point sources have invested heavily in capital, power, and chemical consumption to reduce point source loads
- Reached the point where new "cost-benefit analysis" needs to be done to make most effective decisions
  - Net environmental benefit needs to be considered
  - In many cases, further mechanical treatment often achieves little demonstrated benefit to the receiving water
  - Residents that pay for treatment have reached maximum capacity

**Questions?**