

Nutrient Work Group Minutes May 28, 2015 Meeting

Welcome and Introductions – David Waterstreet, Watershed Protection Program Manager

David Waterstreet, the Watershed Protection Program Manager within the Division of Water Quality, Wyoming Department of Environmental Quality, began the meeting by introducing Work Group members. Waterstreet informed the group that Kevin Frederick, Program Administrator, who is leading the nutrient criteria efforts, is currently out of office on business. He reminded the group that these efforts affect the State of Wyoming and its entities as a whole. These efforts have been continuing over the past several years and involve more than just the Watershed Protection Program. Waterstreet plans to divide the work load between programs in order to more effectively address the various aspects of the project. He reminded the group that we have to keep the progress in motion; moreover, the program has purposely trailed the efforts of other states in order to learn by their example. The overall goal of the program is to develop nutrient criteria within the next triennial review or two. Waterstreet stated that the Work Group is essential and that their input is extremely valued. Further, he wants to expand the group to include every stakeholder that may be affected by these efforts.

During introductions, Roger Stockton with NRCS informed the Work Group of efforts to increase awareness of Soil Health. Soil Health initiatives attempt to reinvigorate soils with various biota, rather than concentrating solely on chemical properties. These efforts have received positive support and provide a more sustainable avenue for agricultural practices.

What's Been Happening in Other Region 8 States – Lindsay Patterson, Surface Water Quality Standards

Lindsay Patterson welcomed the Work Group members and thanked them for their participation. Patterson wanted to start by providing the group with the progress of other Environmental Protection Agency (EPA) Region 8 states. For background information, Patterson reminded the group that nutrients (i.e., nitrogen and phosphorous) are essential for normal aquatic functioning, yet excessive nutrient pollution can have negative economic and ecological impacts.

Region 8 states include Montana, North Dakota, South Dakota, Utah, Colorado and Wyoming. Patterson stated that each states' approach is very unique when developing nutrient criteria. Patterson began by explaining Montana's efforts that have been approved by EPA within the past year. Montana has revised their standards by implementing rulemaking criteria for wadeable streams and one large river. In addition, Montana also utilizes variances to nutrient standards for dischargers. Montana's criteria is largely based on ecoregions (Level III) in which total phosphorous (TP) and total nitrogen (TN) limits are seasonal and assessed by measuring algal endpoints. Because criteria thresholds are generally low, most facilities within Montana may not be able to meet these standards. As a result, Montana has recognized economic and technological limitations and implemented variance packages that can temporarily modify designated uses and their associated water quality criteria. Variances include general variances in order to meet TP and/or TN limits, as well as individual variances that are tailored to specific economic situations for a particular facility. Montana also requires facility optimization in which a discharger improves existing infrastructure to reduce nutrient pollution. Patterson stated that Montana is very progressive in regards to criteria development.

Utah's criteria has been developed for headwater streams, mainly because causative and response variables may be easier to elucidate in these waterbodies. In order to address the complicated relationships among nutrients, Utah has proposed combined criteria in which nutrient loads may exceed numeric thresholds as long as it does not elicit a biological response in streams. Patterson stated that combined criteria provide some flexibility for states that are not fully confident in their numeric thresholds. Further, Utah plans to implement both a TP and TN range for numeric criteria. In January 2015, Utah also implemented permitting regulations for phosphorus for lagoon and non-lagoon treatment facilities.

Colorado has adopted criteria upstream of wastewater facilities and effluent guidelines have been in effect as of September 2012. Since then, Colorado has been collecting data on TP and TN concentrations from dischargers. Their recent efforts have been interpreting the data received from dischargers.

Waterstreet reminded the group that they will focus on these western states as they share similar regional characteristics. He also calls upon the Work Group to inform the program of any additional information.

Nutrient Litigation Update – Dave Ross, Senior Assistance Attorney General

Dave Ross with the Attorney General's Office provided an update on current litigations. Ross stated that there are three major cases that are driving water policy, law and science. Finding the correct range of nutrient loads, and therefore regulating nutrients, has proven extremely difficult. Several lawsuits at the federal level have pushed for the development of nutrient criteria.

Ross began discussing a case in Florida where environmental associations requested EPA to intervene on the state's lack of progress on numeric nutrient criteria. EPA decided that they do possess the authority to intervene based on a necessity determination. The federal government established nutrient criteria for the State of Florida which was then challenged by the state and industry. A Florida judge upheld most of EPA's recommendations except for the use of the reference method which was deemed to be imprecise. Ross told the Work Group that states must use caution when implementing the reference stream method. Florida eventually established their own criteria, however it is still being determined whether power can be transferred from EPA back to the state.

Ross then discussed another case regarding the Chesapeake Bay Total Maximum Daily Load (TMDL). EPA developed a very large and complex TMDL for the Chesapeake Bay watershed that was then challenged by industry due to issues of scientific and public participation. The dispute largely focused on determining where EPA has authority in the watershed. Further, the question arises: if the federal government issues a TMDL, do the states or EPA establish allocations? A judge in Pennsylvania ruled in EPA's favor, however the federal circuit has yet to rule.

Ross continued by discussing a Mississippi River Basin case. As with Florida, environmental organizations asked EPA to intervene using the necessity determination. The environmental organizations felt that the states within the basin were not doing enough to address the Gulf of Mexico issues. Upon receiving the petition, EPA issued a letter acknowledging the nutrient crisis and stating that their efforts will be collaborative with the states. Louisiana ruled that the EPA must establish water quality standards for the Mississippi Basin. EPA appealed a few months ago, and it was ruled that EPA

does have to respond to petitions, yet they are not solely responsible for developing water quality standards if they collaborate with the states.

Ross also mentioned a Minnesota case that involved issues with the aforementioned reference method as well as a case in Iowa in which upstream counties were being sued due to excessive nutrient loading to a drinking water supply. Ross concluded by telling the Work Group that there is a lot of litigation to follow within the states.

Purpose and Function of the Wyoming Nutrient Work Group – Lindsay Patterson

Patterson began by reviewing the background of nutrient pollution, an issue that came to the forefront of water quality in the mid-1990s. The main impetus of the Work Group is to develop numeric nutrient criteria to better address this issue. Currently, most states implement narrative criteria, or descriptive language, that can be ambiguously interpreted. Patterson stated that the development of numeric criteria will better protect designated uses from nutrient pollution, and that this has become the primary focus of EPA and states. Although efforts are underway, Patterson reminded the Work Group that nutrients continue to be a paramount issue.

Nutrient Reduction Strategy – Lindsay Patterson

A significant obstacle in nutrient development are limited resources for states. Further, the interactions between nutrients and response parameters are very complex. Previous efforts by Wyoming include the Nutrient Criteria Development Plan (2008) that was issued in collaboration with Tetra Tech, Inc. Patterson called upon the Work Group to help make further progress.

Patterson then discussed a framework memorandum issued by EPA in 2011. The main goals of the memo were to stimulate conversation among states and stakeholders and encourage collaborative efforts. Further, EPA wants the states to take the initiative in developing criteria and provides flexibility for states to achieve near term reductions. EPA's reduction strategy provides guidelines for addressing nutrient pollution, however these are only suggestions, and Patterson hopes that the Work Group will provide input on the best approach. Ultimately, EPA wants to know the current status of states developing nutrient criteria.

Nutrient Criteria Development Plan – Lindsay Patterson

Patterson stated that Wyoming has responded to EPA's inquiry regarding status of criteria development. Wyoming has updated databases, filled in data gaps, and conducted monitoring for criteria development. Wyoming plans to collect more monitoring data for lakes and reservoirs, as well as revise the Nutrient Criteria Development Plan (2008). Currently, Wyoming will focus on 303(d) listed waters for nutrient reductions in order to develop appropriate TMDLs.

Waterstreet commented that throughout the country, Region 8 is making excellent progress, and that Wyoming has established a healthy relationship with the EPA. Waterstreet stated that the Watershed Protection Program is on the verge of developing conclusions and an idea of what nutrient criteria may look like for Wyoming. However, Wyoming does not want criteria development to exceed the current capabilities of facility operations. Waterstreet wants the Work Group to include participants from various sectors so the program can receive the proper guidance.

Patterson continued by reminding the Work Group that they are here to help the various state programs. In regards to the reduction strategy, the program wants to implement a plan that will actually work within the state. In order to work, the program will need to collaborate with entities that are actually working on the ground. For criteria development, Patterson wants the Work Group to help the program prioritize, evaluate and implement criteria, as well as develop reasonable expectations and methods for assessing nutrient impairment.

Patterson then called on the Work Group for any comments or suggestions. Patterson mentioned the option of hiring a facilitator and contractor for developing any components of a nutrient reduction strategy. The facilitator and/or contractor would be funded by EPA. The contractor has been utilized by 16 other states and is estimated to cost around \$60,000. Patterson answered a group member question by stating that the contractor will be Tetra Tech, Inc. To describe the relationship between EPA-contractor and EPA-Wyoming, Tina Laidlaw with the EPA Region 8 Office commented that EPA will work with Wyoming to determine the scope of work for which Tetra Tech will be responsible. A group member asked whether there were any other contractors, or local contractors, that could be hired. Laidlaw responded that to the best of her knowledge, she is not aware of another contractor who is familiar with the nutrient framework. Laidlaw continued by stating that Wyoming has worked previously with Tetra Tech, so it is a familiar partnership of which groundwork has already been established. A group member commented that he was not satisfied with Tetra Tech's previous work. Waterstreet acknowledged the group member's comment and appreciated the concerns of using an EPA contractor. Waterstreet reminded the Work Group that neither the contractor nor EPA will be making decisions for the State of Wyoming, but instead will be providing suggestions that would facilitate program logistics. Waterstreet assured the group that Tetra Tech is familiar with the region and possesses the necessary skills. Patterson commented that because the Water Quality Division consists of multiple programs, the use of Tetra Tech as a guiding or outside entity could be beneficial. A group member stated that adding another organization would only add to the confusion of the nutrient issue. Patterson commented that the nutrient issue is only a subset of all water quality issues, so having an entity focused solely on nutrient strategies could only facilitate progress. Another group member commented that an outside party (i.e., contractor) would provide a beneficial buffer between stakeholders and the state. The discussion of Tetra Tech continued, with Laidlaw commenting that cost may be as low \$30,000 to upwards of \$70,000. Waterstreet stated that the program will be looking at state funds, given that DEQ funding sources are scarce at this time. A group member wanted to know about contractor deliverables that are tied to the funding. Laidlaw stated that funding is tied to the contractor's scope of work and deliverables that are decided by the state and the Work Group. Patterson commented that deliverables can be as specific or broad as the group wants them to be. In response to another comment about using a local contractor, Waterstreet stated that he had previous reservations about an EPA contractor, however when considering Tetra Tech's offer, state resources and current progress, the use of a contractor is now very appealing. Waterstreet then stated that the state can definitely consider another contractor, but the contractor has to demonstrate that it can assume this significant role. Group members decided that in order to move forward, a survey would be beneficial, as well as additional input and a deliverable framework. A group member suggested forming a subcommittee to make a decision about the contractor. Patterson assured the Work Group that all these suggestions can be accommodated in a follow-up meeting or poll. In regard to the EPA and Tetra Tech contract, it was decided that this document should be reviewed by the Work Group. Additionally, Patterson stated that the program can provide examples of what other states have done with contractors. Further, Patterson agreed with a comment that in collaboration with the Work Group, the program can write up a document describing Tetra Tech's scope of work that would be tailored to Wyoming's needs. Waterstreet and Patterson concluded the discussion of Tetra Tech by calling upon the

Work Group for any additional ideas or objections. Ideas and objections can also be emailed to Lindsay Patterson. Patterson stated that the program will be sending out an updated Nutrient Criteria Development Plan for Work Group comment.

Progress on Water Quality Based Numeric Nutrient Criteria in Wyoming – Eric Hargett, Monitoring Program Assistant Supervisor

Eric Hargett of the Surface Water Monitoring Program began the presentation with an overview of the program's progress for developing numeric nutrient criteria. Hargett reminded the Work Group that much of what he is presenting is preliminary as the work is still in motion. Hargett provided an overview of nutrient pollution, focusing on the economic and ecological impacts of excessive TP and TN. He presented a conceptual model describing the effects of nutrient pollution on Wyoming's three most sensitive designated uses: aquatic life, recreation and drinking water. Using the conceptual model, Hargett drew the attention of the group to five exogenic factors (i.e., hydraulic residence time, light, water temperature, geology/soils and thermal stratification) that influence the relationship between nutrients and the biota of a waterbody. Ultimately, these factors affect the allowable nutrient concentrations that are protective of the aforementioned designated uses.

Hargett continued by discussing the scope of the nutrient criteria. When developing criteria, Hargett told the group that the methodology has to be scientifically defensible and data must reflect the temporal and spatial variation within the state. With this said, Hargett stated that there will not be a universal criteria to apply to all waterbodies (i.e., lake criteria may not be applicable to streams). However, all criteria will consist of two variables: the causal variable and the response variable. The causal variable is the stressor, or nutrient pollution (TP and TN), and the response variable is a measureable effect within the waterbody in response to nutrient pollution. By measuring the endpoints of these variables, the program can develop concentration levels or thresholds that, when exceeded, indicate whether a water body is impaired. Hargett stated that developing criteria for both TP and TN would be in the best interest of the state in order to more effectively manage pollution. Further, the program will focus on chlorophyll-a as a response variable as it is used to measure algal growth. Algae will be used as the primary aquatic indicator because these organisms respond rapidly to nutrient pollution, they are usually the first signal to nutrient pollution, and there is a significant amount of research on the relationship between algae and nutrients.

Hargett then discussed the specifics on how the program plans to develop criteria. There are five standard approaches to developing criteria: a reference-based approach (use of a minimally impacted stream as a comparison), a stressor-response approach (determining at what level of pollution is there a biological response in the waterbody), scientific literature review (evaluating previous studies), the use of modeling (mathematically interpreting complex interactions), and a dose-response approach (experimentally determining response thresholds by exposing organisms to nutrients). Hargett stated that the program will evaluate the utility of each five approaches, however all five may not be applicable to every situation. Hargett assured the Work Group that all lines of evidence that can be used in developing criteria will be used in order to maximize information content, recognize variability and allow for flexibility.

In order to provide background information, Waterstreet discussed how EPA initiated state action in 2007. In collaboration with Tetra Tech, Wyoming devised the Nutrient Criteria Development Plan (2008) that included a program schedule. Waterstreet explained that Hargett is researching any adjustments that need to be included in an updated plan.

Hargett continued by stating that Wyoming is starting to develop criteria for lakes and reservoirs. Lakes and reservoirs were chosen as first priority because it was consistent with the criteria development plan and these waterbodies are easier to derive criteria for than streams and rivers. Further, lakes and reservoirs are important recreational areas, so there was some urgency to develop their criteria. The program evaluated existing data in 2012-2013 and determined that data quality and quantity for lakes and reservoirs was acceptable, and over the past few years, Hargett determined other target lakes for additional monitoring. Using data collected from 2008-2014, Hargett stated that there should be sufficient evidence to develop numeric nutrient criteria. However, Hargett reminded the Work Group that the program still needs to investigate the utility of the five standard approaches.

According to Hargett, the stressor-response approach appears to be the most applicable for lakes and reservoirs. Hargett discussed the stressor-response method by graphing the relationships between stressor and response variables in order to determine a numeric threshold or range. Using this method, Hargett then described the stepwise process of developing candidate criteria: 1) select and evaluate data 2) lake stratification, or grouping of lakes based on similar characteristics 3) developing nutrient and chlorophyll-a relationships 4) analyzing threshold values 5) evaluating candidate criteria. Hargett stated that the program has completed steps 1-2. The program is in the process of completing steps 3-4.

Hargett stated that, overall, the program has been able to differentiate between the different types of lakes in the state. Using the available monitoring data, the program will be developing numeric criteria that will be specific to lake type. Hargett will continue to investigate the stressor-response approach, review the literature and explore the use of modeling. Hargett hopes to disseminate more information at the next Work Group meeting. Hargett then opened the floor for questions.

A group member asked if Hargett found any relationships between nitrogen and response variables. Hargett stated that relationships between TN and chlorophyll-a are very difficult to interpret, and any measurable effects are generally at relatively high nitrogen levels.

Waterstreet commented that the Watershed Protection and Water Surface Monitoring programs are now further in the Nutrient Development Plan and ahead of the Permitting and Wastewater programs. Waterstreet asked the Work Group members to please comment on the plan as they review it. Waterstreet then asked the Work Group to direct any future questions about the plan path to Hargett and Patterson.

Patterson commented that right now the development plan is generic and there are multiple options on which path to take; this was purposely done in order to give the program and Work Group some flexibility when developing criteria.

Wastewater Facilities, Treatment Technology Strategies – Seth Tourney, Water and Wastewater Program

Seth Tourney began the presentation by stating that the Water and Wastewater Program's interest was meeting water quality standards by treating TP and TN in facility discharges. Tourney reminded the Work Group that this is always a collaborative effort between all peoples and entities of the state. Treatment technology capabilities are available to meet water quality standards, however, Tourney is concerned whether these technologies are available in the communities that need them

most. Tourney described the cost feasibility studies utilized by other states such as Montana, Colorado and Utah. The data from these studies has been made available to Wyoming.

Tourney's charge is to determine what technologies are applicable to Wyoming. The Water and Wastewater Program is proposing to conduct a one year study that will provide a summary of the current wastewater treatment plant (WWTP) operations within the state. The program will select 12-18 WWTPs across Wyoming in order to determine what technologies are in use, as well as collect samples of their influent and effluent to determine their effectiveness in removing nutrients. Tourney provided an overview of Wyoming's treatment options for nutrients as well as how to select communities to be included in the study. Tourney plans to choose communities that will represent the various technologies and regions across the state, but called upon the Work Group for their input. The overall report process will involve choosing facilities, establishing communication with those facilities, taking samples, and producing deliverables. Tourney hopes that the deliverables will provide a snapshot of current Wyoming operations as well as inform potential contractors (i.e., Tetra Tech) of additional technologies that are available and applicable to the state.

Tourney continued to describe the study format. Once communities and facilities are selected, the program will investigate the processes utilized by each facility. Treatment performance would then be evaluated by assessing nutrient levels in the influent and effluent waters. Finally, operational costs would be determined, specifically how much of the cost is the responsibility of the community. Tourney broke down the study cost and proposed a budget of \$23,400. Tourney plans to present the proposal to Kevin Frederick, the Program Administrator, with Work Group input. As such, Tourney asked the Work Group whether the project was in the state's best interest.

A group member asked why Tourney only chose mechanical plants for the study focus. Tourney responded that the program looked at all types of facilities that are represented in the state. Tourney added that this kind of study would provide groundwork to justify variances that may be issued for facilities in the future. A group member commented that the study is a good approach. Another member asked about laboratory costs and whether projected costs included wages for state personnel. Tourney responded that projected costs only include sample analysis and shipping, yet samples will be going to the state lab. A staff member commented that this information would be extremely helpful. A group member stated that the approach seems ideal. Another member commented that the approach seems timely, however it is important to understand what these facilities are discharging and what kind of nutrient limits we need to establish. A group member stated that facility operators would be interested in participating in the study and reviewing the results. Patterson commented that the only nutrient data available from facilities are samples taken by compliance officers; the sampling frequency can be as low as one sample every five years. A group member stated that this study would enable the state to assess the costs associated with meeting the established criteria. Patterson agreed and mentioned that it will be important to determine what is reasonable for our state facilities. Tourney responded to a question that other states do not have data that is applicable to Wyoming's situation. A group member asked if there was an estimate as to how much of the nutrient problem is attributable to WWTPs and agriculture. Tourney responded that he was not sure. Patterson commented that estimating contributions could be part of the reduction strategy. Another group member asked if the study resembled a before and after approach. Tourney confirmed, explaining that the study will be comparing influent and effluent samples.

Tourney reiterated that this study is relatively inexpensive and will provide an assessment of current Wyoming WWTP operations. Further, the study will provide the state with an idea of nutrient

limits that can be compared to any recommendations provided by a contractor. The study will be more so a volunteer effort rather than a large scale, cost-benefit analysis.

Harmful Algal Bloom Action Plan for Recreational Waters/Harmful Algal Bloom Action Plan for Drinking Water Supplies – Lindsay Patterson

Waterstreet commented that the meeting is running over schedule and he does not want to keep anyone from prior obligations. Waterstreet asked Patterson to provide Work Group members with materials relevant to the meeting. Patterson stated that she will distribute examples of Tetra Tech proposals and determine the best way to answer meeting questions. Further, Patterson will provide the updated Nutrient Development Plan for group review.

Patterson briefly mentioned the HAB Action Plan and stated that the program is willing to work with any interested stakeholders on further developing the plan. Patterson will be reaching out to entities that can be potentially affected by HABs.

Patterson will be working on posting meeting materials on the Department of Environmental Quality website. Patterson informed group members that she will send an email describing where materials can be found.

Patterson proposed holding the next meeting sometime in July. The Work Group will be polled at a later date to determine how members feel about the Tetra Tech contractor.

Waterstreet and Patterson thanked the Work Group for their time and input.