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2016 NATIONAL TRAINING WORKSHOP FOR CWA 303(d) LISTING & TMDL STAFF

NAVIGATING THE COURSE

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FINAL PROJECT REPORT & TRAINING WORKSHOP PROCEEDINGS

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ELI maintains a companion website for this project: our CWA 303(d) Program Resource Center (<http://www.eli.org/freshwater-ocean/state-tmdl-program-resource-center>).

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I. INTRODUCTION

At the beginning of June 2016, the Environmental Law Institute (ELI) convened the *2016 National Training Workshop for CWA 303(d) Listing and TMDL Staff: Navigating the Course*. This event, supported through a cooperative agreement with the U.S. Environmental Protection Agency (EPA), brought together Clean Water Act (CWA) Section 303(d) listing and TMDL officials from 47 states, Puerto Rico, and the District of Columbia as well as a water quality professional from the Confederated Tribes of the Umatilla Indian Reservation. The assembled participants learned about the progress being made with regard to key program responsibilities, particularly in light of the CWA 303(d) Program Vision;¹ new and improved tools and data systems for decision-making and water quality data reporting; and methods of collaborating with other programs to improve program implementation, from the amount and quality of monitoring data to the effectiveness of restoration efforts. Participants also gained better understanding of how “alternatives” consistent with the CWA 303(d) Program Vision can be developed, as well as greater personal familiarity with colleagues from other jurisdictions, representatives of EPA Headquarters and the EPA regions, a representative of the Association of Clean Water Administrators (ACWA), and two representatives of the New England Interstate Water Pollution Control Commission (NEIWPC).

As with similar events of national scope convened in June 2008, May 2009, April 2011, April 2012, April 2013, May 2014, and April 2015, ELI intended for this training workshop to provide a forum for program officials to learn about current best practices in listing, TMDL development, and TMDL implementation; to interact with one another; and to share their programmatic ideas and concerns. To ensure a planning process that would culminate in a workshop attuned to the needs of program implementers in the states, tribes, and territories, ELI assembled a Workshop Planning Group (WPG). For five months, the WPG worked through a highly participatory process to develop, shape, and refine the workshop objectives and agenda, the structure and focus of workshop sessions, and the course materials.

State, tribal, and territorial participants, including members of the WPG, typically were individuals with substantial responsibility in their respective programs, but who were not far removed from day-to-day program operations. Key to this event, like prior ones, was having the right people in the room.

The three-day training workshop, held at a federal facility in a retreat-type setting, was successful by the metrics of sharing useful information, generating new ideas, and building new relationships. Distinct takeaway messages emerged from the gathering; these themes are identified in Part II of this report. The bulk of the report, Part III, contains a detailed, session-by-session summary of event proceedings. Appendices to the report include the training workshop agenda, a list of participants, a full compilation of participant evaluations and comments, and information on ELI’s companion website. ELI continues to build on the momentum and enthusiasm generated by this and the prior years’ training workshops through an ELI-administered website for CWA 303(d) programs and through a listserv dedicated to state, tribal, and territorial professionals and designed to increase and enhance interactions among programs.

¹ https://www.epa.gov/sites/production/files/2015-07/documents/vision_303d_program_dec_2013.pdf.

II. THEMES AND OTHER TAKEAWAYS

From the perspective of ELI staff in attendance, the following are significant themes, points, and observations that emerged over the course of the training workshop. They are not intended to reflect complete agreement among participants.

The CWA 303(d) program is positioned well, but there is much work to do.

- The CWA 303(d) program is lively, integrating, and engaging.
- Individuals at different levels are starting to understand one another better, what each needs and how to work together.
- With more than 40,000 CWA 303(d) listed segments and the likelihood of more impairments (as a significant percent of the country's waters have not been assessed with waterbody-specific information), a key question is how to use resources strategically to achieve environmental results in water quality.
- With the majority of states articulating program priorities, pathogens and nutrients are the most common pollutant-related priorities, both in terms of the number of states and total acres.

Better presenting more data, and the sources of the data, will facilitate more stakeholder engagement and ultimately more improvement in water quality.

- Online data collection and storage tools can clarify, simplify, and unite data submission, access, and quality assurance processes, ultimately improving the amount and usefulness of data from varied sources.
- Some states have enhanced data management tools that others could tailor to their needs, e.g., one state has developed a water quality data tool in R because its prior data management approach was not efficient; a talented individual on staff overcame the R learning curve; and the software is free, flexible, powerful, and fast.
- EPA will continue to focus on developing the community of core data management tools with open source software to supplement what states, tribes, and territories are developing, e.g., the Data Discovery tool allows users to search, summarize, quality control, and display data from the Water Quality Portal (a cooperative data storage service provided by EPA, USGS, and the NWQMC).

The CWA 303(d) program relies on data from many sources, and there are creative ways to maximize the quality, quantity, and general usefulness of those sources.

- Monitoring conferences and water quality monitoring councils aid data collection and coordination by providing face-to-face contact between relevant agencies, academic researchers, and other data contributors.
- Providing laboratory capacity for volunteer monitors can increase the amount of data from this source and help direct where and what data are collected.
- EPA and the states, tribes, and territories should share methods of promoting, collecting, and using citizen data to fill data gaps.

The transition to the new ATTAINS system will occur in the spring of 2017.

- The goal is to use ATTAINS for the 2018 Integrated Reporting cycle.
- The new ATTAINS system will contain assessment information, actions taken (e.g., TMDLs), state-wide statistical survey results, performance measures, and CWA 303(d) Vision priorities.
- A new feature of the ATTAINS system is the ability to associate monitoring locations with corresponding assessment units, which allows greater integration of water quality data with assessment conclusions.
- The parameters section is a new concept within ATTAINS, creating the ability to convey information about the parameters not causing the impairment, as well as those that are.

States, tribes, and territories should focus on doing what needs to be done to restore waters and rely on EPA to fit those efforts into the program measures and national message.

States and territories will continue to develop TMDLs, but they recognize that sometimes an “alternative” is available that allows them to capitalize on good ideas, available resources, and interested partners to improve water quality.

- The development of TMDLs is still a statutory obligation, and “alternatives” are not undertaken in lieu of TMDLs. However, if water quality standards are subsequently met, a TMDL would no longer be required.
- Particularly for alternative restoration plans that anticipate a longer timeline for achieving water quality standards, interim milestones are useful for determining whether the plan is on track to meet water quality standards or whether the water should be reprioritized for TMDL development.

- Progress eventually needs to be demonstrated in the quality of the water, but in the near-term, initial progress could center on assembling partners, procuring funding, and meeting other milestones, especially for complex and lengthy restoration efforts.

There are no requirements regarding specific elements to be included in the description of an alternative restoration plan.

- The overall purpose of the description of an alternative restoration plan is to show how the “alternative” is designed to meet water quality standards.
- The 2016 Integrated Reporting Memorandum provides criteria to consider when developing that description, but not all of the criteria need to be addressed in each alternative restoration plan.
- Each description of a restoration plan is case-specific and tailored to the impaired waterbody’s particular circumstances.

Including or emphasizing certain aspects of “alternatives” can improve the likelihood of success.

- Since buy-in from stakeholders and potential partners often is critical to developing and successfully implementing an alternative restoration plan, outreach and education commonly are important early tasks.
- Strong (local) leadership can increase buy-in and improve plan implementation.
- Identifying all sources of the impairment and their approximate contributions to the problem can improve the collaboration with pollution contributors and ultimately their buy-in to the plan. A state developed a “TMDL-Lite” model that covers the major aspects of a TMDL analysis but can be done in a fraction of the time.

The opportunity to develop watershed-based plans in a manner that they also could be considered as “alternatives” under the CWA 303(d) program has garnered significant interest.

- There is extensive overlap between the nine elements of a watershed-based plan and the considerations in the Integrated Reporting Memorandum to help describe “alternatives” for the purpose of the CWA 303(d) program measure. However, watershed-based plan review for purposes of the CWA 319 program may have more emphasis on some elements, such as monitoring and stakeholder involvement, and may have less emphasis on others, such as those pertaining to point sources and water quality standards data.
- EPA’s review of watershed-based plans will differ for CWA 319 and CWA 303(d) program purposes, but communication and collaboration in this review is important, and some EPA regions have developed a process for it.

Water quality protection is well-established, but it is a relatively new concept for the CWA 303(d) program.

- EPA intends to have Preliminary Healthy Watersheds Assessments for the lower 48 states by the end of 2016, to provide them with a systematic basis to plan protection.
- Most states are protecting at least some waterbodies on a case-by-case basis, and usually as part of existing processes, such as watershed-based plans and watershed TMDLs.
- EPA has outlined a conceptual framework for protection with three stages: (1) assessing waterbodies for protection purposes, (2) prioritizing waterbodies for protection and developing a planning process, and (3) implementing planned protection actions.
- While there is significant flexibility in the form and content of protection plans, they likely will be most effective if they contain sufficient waterbody-specific information to describe the intended actions and desired results.
- Monitoring is needed to tell the story about waterbodies that are in good condition and how to keep them there.

A combination of approaches, such as probabilistic monitoring, targeted monitoring, remote sensing, and edge-of-field testing, can be used to monitor the effectiveness of water quality improvement efforts.

- Factors to consider when selecting how to monitor effectiveness include: the scale at which the changes will be measured; whether a specific pollutant is being tracked; whether the effectiveness of specific controls is being measured; and the timeframe for data collection.
- Knowing when to monitor effectiveness is difficult and depends heavily on the problem and solution, but scenario modeling, responding to monitoring requests from stakeholders, building on experience, and learning lessons from others can help.
- A rotating basin approach to site-specific monitoring is a built-in means of conducting effectiveness monitoring, once the first rotation is completed and the basins are being monitored again.
- EPA and states, tribes, and territories should share examples of approaches to and tools for effectiveness monitoring.
- For effectiveness monitoring to be meaningful, good baseline data should be established.

Coordination between the CWA 303(d) program and other programs and agencies occurs in many ways, from the physical proximity of the respective staff, to regular calls or meetings, to established procedures such as exchanging plans and priorities for review across programs or agencies.

There are multiple statutory and practical challenges to integrating MS4s and TMDLs, but also many approaches for overcoming them.

- Characteristics of MS4s that make integration with TMDLs challenging include: the sources commonly are diffuse over a large area; there is a lack of monitoring; it is difficult to determine load reductions from best management practices; and attaining water quality standards may take time.
- Unlike other point sources under the Clean Water Act, MS4 discharges are subject to the “maximum extent practicable” (MEP) standard. However, MS4 permit requirements must still be established to address applicable TMDLs.
- TMDL and permit writers should coordinate efforts to identify stormwater contributions from specific sources during TMDL development.
- A MS4 permit should include effective, measurable water quality-based effluent limitations to achieve an applicable wasteload allocation.
- One state is requiring applicants for new MS4 permits to submit a TMDL implementation plan that prioritizes best management practices for addressing the applicable pollutants, and the permittee must show progress during the permit term.
- EPA and the states, tribes, and territories will need to continue to explore ways to share tools and approaches to develop “permit-friendly” TMDLs or to more easily integrate wasteload allocations into MS4 permit requirements. Methods of integration have been as simple as a MS4 permit explicitly referencing coordination with a TMDL implementation plan or the CWA 303(d) program noting water quality requirements in the MS4 permit.

There are significant challenges to and opportunities for incorporating water quality standards into the objectives of cleanup efforts.

- Multiple state and federal agencies often have a stake in a waste cleanup, and each agency and program usually has its own set of priorities, goals, and limitations.
- Effective communication with stakeholders as well as other agencies and programs is critical to successful integration on waste cleanups.
- CWA 303(d) program staff can better their chances of attaining water quality standards from cleanup efforts if they: emphasize the attainment of standards when commenting on planned activities; request that monitoring activities include the collection of water quality data rather than just visual assessments of project stability; and get a commitment to revisit the project if goals and objectives are not met.
- TMDLs can lead another agency to prioritize an associated waste cleanup project, can prioritize funding for that project, or can simply highlight the fact that there is a Clean Water Act issue and encourage consideration of that element of the problem.

III. WORKSHOP PROCEEDINGS: SESSION-BY-SESSION DISCUSSION

Following is an overview and detailed discussion of the training workshop, presented session by session. The full training workshop agenda appears in Appendix 1 to this report.

Welcome, Introductions, and Training Workshop Overview

ELI staff opened the workshop by welcoming the many participants from across the country, including CWA 303(d) program staff from 47 states (with nearly one-third of them sending a second, and even a third participant at their own expense), Puerto Rico, and the District of Columbia as well as water quality program staff from the Confederated Tribes of the Umatilla Indian Reservation. The training workshop also included staff from EPA Headquarters and the EPA regions, two representatives of the New England Interstate Water Pollution Control Commission (NEIWPCC), and a representative of the Association of Clean Water Administrators (ACWA). A complete list of workshop participants, their affiliations, and contact information is provided in Appendix 2 of this report.

Benita Best-Wong, EPA Headquarters, gave the keynote address. Ms. Best-Wong thanked the participants for their efforts in implementing the CWA 303(d) Program Vision, and she emphasized how impressed she has been by the sustained energy and focus on achieving this objective. However, she added that the work is not done, that the water program is filled with challenges, and TMDLs often are in the middle of those challenges. Ms. Best-Wong noted that the water crisis in Flint, Michigan has shined a spotlight on EPA's water program, and one of the first questions that she received was whether the Flint waterways were on the TMDL list. She said: "Our mission is public health and the environment, and Flint brought home the public health aspect."

Ms. Best-Wong stressed how much the success of the national water program relies on working across federal and state levels, and with academics and other organizations. She noted the recent accomplishments regarding wetlands protection, efforts that spanned a number of agencies and NGOs. She also noted multiple collaborations concerning data management, from the establishment of regional data managers, to work with USGS, to the public engagement benefits from easier-to-access information. Ms. Best-Wong challenged the participants to make the ATTAINS database the best system possible: to use it to make assessment decisions, to add data, and to help modify and improve it. Ms. Best-Wong also emphasized the collaboration necessary in securing (and stretching) funding, highlighting a recent joint state and tribal grant and financial support from the Penn Foundation for work on the Delaware River. She added that it is imperative to partner with other entities to get the work done and to help spur innovation.

Ms. Best-Wong explained that, since Joel Beauvais became the Deputy Assistant Administrator for the Office of Water, he has stressed the importance of communicating what the national water program is about. Senior management at EPA Headquarters has identified six key priorities from the many that exist across the programs in the Office of Water.

1. Safe drinking water, which, she said, is the responsibility of every program.
2. Climate, ensuring that the country is prepared and will be resilient in the face of changing weather patterns, increased flooding, etc.
3. Infrastructure and innovation, finding new ways to address infrastructure needs, particularly with regard to funding, as the state revolving fund cannot cover the investment needed, and to prioritize what is to be fixed.
4. Protection of great water bodies, focusing on waters that are in good condition and the restoration of those that were once great, such as the Chesapeake Bay, the Great Lakes, and the Gulf of Mexico.
5. Nutrients, which continue to be the number one water pollutant, and a challenge, will be the topic of further information to come. Ms. Best-Wong added that states have done good work in reducing nutrient pollution, but that there is much more work to do.
6. Stormwater, which is the source of many problems in the country's waterways, will be the focus of information to come. She noted that EPA Headquarters is analyzing how best to manage stormwater, has been pushing green infrastructure, and believes that improvements will come by working with local entities to figure out how to best manage stormwater.

Ms. Best-Wong said that the senior management at EPA Headquarters believes that the tools necessary to address these problems are available. She noted that good work has been done to build the relationships between EPA and the states, that water quality issues have the public's attention, and there is innovation in the regulatory gap. Ms. Best-Wong applauded the CWA 303(d) Treatment in a Similar Manner as States rule that was proposed earlier this year, but added that figuring out how states and tribes will work together on listings and TMDL development will be critical to its success. She also applauded the growth of the Healthy Watersheds program in the last decade and the strength of the Trash-Free Water program, since its name-change from the Marine Debris program.

Ms. Best-Wong concluded with a request of the participants to have frank conversations with their colleagues in other portions of the water program, including the wetlands program, permits program, and drinking water program, as well as with financing staff. She mentioned the new water resource finance center, which looks at innovative ways to finance large water infrastructure projects. Ms. Best-Wong emphasized that the program will be stronger if load and wasteload allocations are developed with an idea of the funding opportunities available. In summary, collaborate even more than you have been.

Session 1: Vision Priorities – Lessons and Next Steps

This session featured two presentations. The intended outcome of the first session was:

- Participants will learn what other states and territories have prioritized, for purposes of the CWA 303(d) Program Vision, and how they selected those priorities.

(1) Adam Schempp, ELI: Overview of State Prioritization Frameworks

Mr. Schempp began his presentation by thanking the participants for sharing information on their CWA 303(d) Vision prioritization frameworks over the prior few months. He noted that the frameworks that states and territories have approved for public release have been posted on ELI's *CWA 303(d) Program Resource Center* web portal (see Appendix 4). Mr. Schempp said that his presentation is based on the narrative information in the framework documents, not the lists of priority waters, from 44 states. He explained that ELI developed a set of questions to serve as the basis for analyzing the frameworks, attempting to draw out from the documents the information that may be of most interest to this audience. He added that not all frameworks addressed all of the questions, nor were they expected to do so, but the questions provided a common ground in the analysis. He also clarified that the presentation reflects ELI's understanding of the frameworks and covers that information in the aggregate, rather than referencing individual states.

Mr. Schempp said that the states organized their frameworks in a wide range of ways and with varying levels of detail about the Vision prioritization process. He noted that states are using the framework documents for some or all of the following purposes: to explain how the state's Vision priorities were chosen; to establish a system for prioritizing that can be used to identify current and future priorities; and to identify the state's specific universe and list of Vision priorities. Most often, the framework document both created a system for prioritizing and listed or explained the Vision priorities that were the "results" of the process.

Mr. Schempp then detailed the Vision prioritization processes that states had used. He explained that the process often involved one or more of the following steps: (1) define a "candidate pool," often based on an overall focus or program goal; (2) reduce the candidates to a list of geographic units in which to work through 2022; and (3) order the resulting list of Vision priority areas or waterbodies.

Mr. Schempp noted that, rather than analyzing all impairments for potential prioritization, over 70 percent of the states started by choosing an overall focus area:

- Specific pollutants were the most common areas of focus, with 12 states addressing impairments caused by, or waters to be protected from, particular pollutants or pollution sources. Seven other states focused on one or more pollutants as well as particular designated uses or particular pollutant-use combinations. Mr. Schempp relayed the reasons cited for this approach as the number of impairments, public health, the relationship to other pollutants, and the difficulty or ease of developing and/or implementing the TMDLs. Nutrients, sediment, and bacteria were the most common pollutants chosen as an overall focus for Vision priorities.
- Three states selected particular geographic units as their areas of focus: basins for targeted nonpoint source pollution CWA 319(h) funding; basins identified in the existing Nutrient Loss Reduction Strategy document as "priority watersheds for reducing nutrient losses;" and watersheds where multiple water programs' priorities overlapped.
- Three states decided to focus their prioritization efforts on waters impaired for particular designated uses. Five other states focused on waterbodies with one or more particular

designated uses and one or more particular pollutants. The uses on which states focused included drinking water, aquatic life, fishing/shellfishing, and recreation.

- Four states focused on waterbodies with particular pollutant-use combinations, most commonly concerning human health. Two other states focused on waterbodies with particular pollutant-use combinations and particular pollutants.

Mr. Schempp noted that a few states that defined a pool of candidates based on an overall focus also noted a small, discrete group of other impairments potentially to be included in their Vision priorities.

Mr. Schempp explained that 38 of the 44 states for which ELI reviewed the frameworks narrowed down their initial candidate lists by selecting a subset of the candidates as high priority (screening), ranking the list of candidates, or both. He added that states took a wide variety of approaches in screening or ranking the specific priority waters. Three states used a standardized process, with established criteria or consistently-weighted indicators; five states considered factors using best professional judgment; and the vast majority of states combined a standardized process with subjective considerations. Mr. Schempp elaborated on the standardized mechanisms that states used, noting that the WATERSCAPE and Recovery Potential Screening tools, among others, were used to determine the greatest recovery potential among impaired waters, and some states used National Land Cover datasets and Qualitative Habitat Evaluation Index scores. Of the factors that states considered when selecting and/or ranking their Vision priorities, the presence of interested stakeholders was the most common, and the likelihood of successful implementation was a general theme.

Mr. Schempp concluded with information gleaned from the frameworks concerning the focus on protection and the role of the public and other CWA programs in prioritization. He said that seven states have included priorities for water quality protection and another eleven intend to do so in the future, while only four states explicitly did not prioritize protection. Mr. Schempp noted that, while only four states conveyed in their framework documents that the public had a role in defining the initial candidate pool, fifteen states referenced a role of the public in selecting Vision priorities, and fourteen states referenced a role of the public in reviewing Vision priorities. Mr. Schempp also highlighted that, in a majority of states, other CWA programs, often one or more of the nonpoint source, permits, and monitoring programs, had a role in selecting and/or reviewing the list of Vision priorities.

(2) Jim Havard, EPA HQ: Vision Priorities and Program Overview

Mr. Havard applauded the states on the development of the Vision priorities, with well over 90 percent of states having submitted draft priorities. He said that he is pleased to see the variety of approaches that states have taken, that prioritization tools like WATERSCAPE and the Recovery Potential Screening tools have helped, and that states are incorporating integration and engagement. He recommended that participants look at the story map that Connecticut has developed, providing an integrated picture of the state's priorities.

Mr. Havard emphasized that the CWA 303(d) program is positioned well: years ago, under consent decrees, the objective was to develop as many TMDLs as possible, without much focus on the order of development and how they were developed, but now states have

identified their priorities, and that is the basis for program measures. The program is lively, integrating, and engaging. He added that the program must focus on continuing its restoration and protection efforts.

Mr. Havard transitioned to a recap of the priorities that states had submitted. He distinguished this information, drawn from the data submitted, from that provided by Mr. Schempp, which was drawn from the narrative prioritization frameworks. Mr. Havard noted that 48 states and some territories had submitted draft priorities and annual commitments under WQ-27. He said that 45 states and territories had identified nutrient-related priorities. Pathogens and nutrients were the most common pollutants identified, both in terms of the number of states and total acres. He added that eleven states have identified protection as a component of their long-term priorities, with eight of them specifically focusing on nutrients.

Mr. Havard then provided some basic statistics about the program: more than 70,000 TMDLs have been completed, and 449 lists have been approved as of February 4, 2016, but there are more than 40,000 CWA 303(d) listed segments, and more impairments likely exist, as more than 50 percent of the country's waters have not been assessed with site-specific information. He said that the key question is how to use resources strategically.

Mr. Havard offered a list of programmatic themes. He noted that the CWA 303(d) program is well on the way to implementing the Vision. He emphasized the opportunity to focus on restoration and protection, and the importance of protection plans. He highlighted the need to focus on integration and engagement to see success in practice. He added that assessment and listing continue to present challenges and opportunities. Mr. Havard made special note of the role of information and technology in the future of the program, from facilitating data management and analysis, to aiding communication with the public about results and the status of the program, to linking CWA 303(d) program results with those of other programs. He expressed hope that participants are getting comfortable with the tools and reporting methods being developed, but also that participants do not get too concerned with the details.

Mr. Havard concluded with an update regarding EPA's efforts. He noted that the CWA 303(d) program staff have been coordinating with CWA 319 program staff on multiple efforts. He added that EPA Headquarters and regional CWA 303(d) staff developed joint principles for reviewing "alternatives." He highlighted the recent developments regarding the role of tribes' in the CWA 303(d) program. Mr. Havard referenced the four cooperative agreements concerning engagement, including one with ELI on outreach to stakeholders; last year a group presented at WEFTEC, and this year at River Rally. For the River Rally presentation, he noted, EPA Headquarters developed a simple fact sheet to explain the CWA 303(d) program. He also cited the cooperative agreement with NEIWPCC regarding a webinar series, the first of which had occurred the week prior to the training workshop.

Key Points Raised:

- With more than 40,000 CWA 303(d) listed segments and the fact that more impairments likely exist (as a significant percent of the country's waters have not been assessed with site-specific information), a key question is how to use resources strategically to achieve environmental results in water quality.

- Over 90 percent of states had submitted draft priorities and annual commitments under WQ-27.
- Pathogens and nutrients are the most common pollutant-related priorities, both in terms of the number of states and total acres.
- States organized their Vision prioritization frameworks in a wide range of ways and with varying levels of detail about the prioritization process.
- In most states, the prioritization process involved one or more of the following steps: (1) define a “candidate pool;” (2) reduce the candidates to a list of geographic units in which to work through 2022; and (3) order the resulting list of priority areas or waterbodies.
- Over 70 percent of the states chose an overall focus area, whether one or more pollutants, particular geographic units, certain designated uses, specific pollutant-use combinations, or multiple of these factors.
- Most states narrowed down their initial candidate lists by screening and/or ranking the list of candidates through a standardized process, best professional judgment, or both.

Session 2: The ATTAINS Redesign

This session featured one presentation by two presenters, with opportunities for questions. Intended outcomes of the second session included:

- Participants will learn about the changes that are being made to the ATTAINS data system.
- Participants will learn about how the Integrated Reporting process and the measures reporting process will work in the new ATTAINS data system, including key dates.

Shera Reems, EPA HQ, and Dwane Young, EPA HQ: Overview of the ATTAINS Redesign and Its Progress

Ms. Reems started the session with an acknowledgement of and appreciation for the effort by participants to adapt to the new measures. She then highlighted a few developments at EPA. She explained that regional data management coordinators have been identified in each EPA region, to serve as the go-to EPA data experts for the states, tribes, and territories of each region. She added that those individuals are present at the workshop and will be undergoing a separate training on Thursday and Friday, but that the informal evening session on Thursday is dedicated to providing an opportunity to meet those data coordinators. Ms. Reems also mentioned that next year, in tandem with this training workshop, will be a data training workshop for state, tribal, and territorial staff. Like this event, the expenses for one participant from each state and select tribes and territories will be covered, and the training on data management tools will be three days long. She noted that ATTAINS likely will be a prominent focus of the training, since it will be rolled out in that timeframe.

Ms. Reems then introduced a game of Jeopardy as a means of making the first part of their presentation more interactive. She explained the two categories, ATTAINS and measures, and invited a participant to select a category and clue. Clues and answers went as follows:

- This is the date that States should be ready by to transition to the new ATTAINS system.
 - o What is spring 2017?

- These are the two methods for states to submit Integrated Report data to the new ATTAINS system.
 - o What is the Direct Data Entry and Exchange Network?
- The new ATTAINS system will accept documents (e.g., pdf).
 - o What is true?
- This is the main difference between WQ-27 and WQ-28.
 - o What is WQ-27 focuses only on priorities?
- This is how my state might participate in piloting the new ATTAINS system.
 - o What is contact your EPA region and Dwane Young (young.dwane@epa.gov), and we will provide you with a username and password to access the system in production?
- In FY 2017, the WQ-27 measure will provide partial recognition.
 - o What is true?
- Resources are available to assist states and territories with the transition to the new ATTAINS system.
 - o What is true? If you will need additional support contact your EPA region now.
- This is when states can make changes to the CWA 303(d) Vision priorities recognized under WQ-27.
 - o What is beginning with FY 2017? Changes will only be accepted at the start of each fiscal year.
- This is when the measures information will be available publicly via ATTAINS.
 - o What is the summer of 2017? This fall, EPA will begin to work with regions and states on the public-facing ATTAINS.
- This is what states need to continue doing.
 - o What is making sure my state has GIS coverage of assessment units and that the identifications match between the GIS coverage and the state attribute data? With this information, EPA is able to use ATTAINS to automate the calculation of the measures.
- This is what happened with WQ-28.
 - o What is Shera focused on WQ-27 due to the mid-year open season, and this summer we will begin to work with regions and states on WQ-28?
- If my state is interested in using the Exchange Network, are there resources available?
 - o What is yes, the Exchange Network has a grant process? The FY 2016 request for proposals will go out late summer/fall with proposals due in November.
- These are the major types of information in the new ATTAINS system.
 - o What are assessments, actions (e.g., TMDLs), state-wide statistical survey results, performance measures, and CWA 303(d) Vision priorities?

One participant asked whether ATTAINS will be used for the 2018 assessment cycle, but not for the 2016 cycle, to which Ms. Reems replied, generally yes, but some states may still be doing their 2016 assessment when EPA is ready to kick off the new system, beginning with the 2018 cycle. She added that the goal is to use ATTAINS for the 2018 cycle.

Another participant said that she has found ATTAINS to focus on the immediate waterbody, and not on the upstream connections contributing to impairments in downstream waters. She asked whether it is possible to address that issue. She added that, under the current structure,

it appears that her state has many protection plans for waters not impaired by nitrogen and oxygen depletion, when in fact those plans are part of the restoration of downstream waters. Ms. Reems acknowledged the challenge and said that they are discussing it.

Mr. Young then led the participants through a live demonstration of the ATTAINS database. He said that this product is the work of a design team composed of state staff and representatives from every EPA regional office. He added that they are rolling out new functionality every few weeks.

Mr. Young demonstrated the Direct Data Entry system. He explained that states with their own tracking systems probably should use the Exchange Network for submitting data, and EPA will process it, but states without their own tracking systems probably will use the Direct Data Entry system. He added that states could use a mix of the methods, such as using the Exchange Network for submitting Integrated Reporting data and the Direct Data Entry system for TMDL data. Mr. Young then displayed the Direct Data Entry system home page, noting that there is not much currently on it, other than a place for notifications, e.g., that the EPA region has started reviewing the state's recently submitted data, has a question, etc. He directed participants to the row of tabs across the top of the screen, saying that they are all the basic concepts within ATTAINS: assessment units; assessments; actions, which are TMDLs, "alternatives," or protection plans; reports; and priorities. He noted that "administration" will be where users can be added, permissions given, etc.

Mr. Young said that the assessment unit piece is mostly finished, with only small tweaks left to be completed. When that section is accessed, it provides the user a complete list of all assessment units. By default, the window displays ten results at a time, but that can be changed. The user can search by waterbody name, waterbody type, identification number, or any of the other categories listed. The summary screen provides all of the information on the assessment unit: name, comments, location information, size, etc. To edit the summary, click "Edit." Mr. Young emphasized that EPA encourages states to associate monitoring locations with corresponding assessment units, a new feature of ATTAINS, which allows greater integration of water quality data with assessment conclusions.

An EPA Headquarters participant asked what is meant by the "active" and "retired" status options, to which Mr. Young explained that assessment units never go away; they simply are retired. If, for example, an assessment unit is divided into three parts, the old identification number and associated information is not lost, but it is labeled as "retired." A state participant then asked whether monitoring locations can be changed per cycle, and Mr. Young said yes. Another state participant asked whether the dropdown arrows are standard nationally. Mr. Young replied that they are set for each state, usually based on the state's water quality standards. He added that the design team is working on tailoring all of the dropdown lists, from designated uses to causes of impairment, for each state. Yet another state participant asked whether the user rights can be customized, so that each of the state's regions can do this work for their sections of the state, to which Mr. Young said yes. A fourth state participant asked whether this information is geospatially referenced. Mr. Young replied that all assessment units should have a GIS reference.

Mr. Young then covered the assessments section. He explained that it represents the Integrated Report. The assessment units are automatically updated with each new Integrated Report, and they keep track of what has been changed. Mr. Young said that the design team modeled this section of the website after the TurboTax wizard, to walk users through the process. It starts with basic information: use, cause, source, etc. One point of discussion was the “site last assessed” box, but they decided that they need to collect that information so that everyone knows how long ago the assessment was conducted. Mr. Young noted that many of the information boxes are optional. He also said that the system will offer many comment opportunities for staff.

Mr. Young then explained that the designated use page should reflect the state’s water quality standards, but there is the ability to add new uses. He said that the user can provide metadata, such as the type of assessment and the confidence level in the assessment. Mr. Young noted that the parameters section is a new concept within ATTAINS. Under the old system, there was no way to convey information about parameters not causing the impairment. For example, oxygen depletion was causing the impairment, but pH was fine, metals were fine, etc. This is a means of capturing all of that information. Mr. Young added that there is a sources section, which is completely optional.

Mr. Young asked the participants to test out the system and provide feedback on its usability. He said that this is a bare bones version, and that the team will be releasing a new, updated version every month through next April, when the final version should be available.

A state participant sought clarification that there will not be a desktop version of ATTAINS, to which Mr. Young concurred. An EPA regional participant asked whether changes made will simply override the pre-existing version of the assessment, or whether everything will be saved. Mr. Young replied that, at every step in the process, the system will take a snapshot of the data, and that snapshot will become a record, adding that the system will flag changes, so as to know who made the assessment conclusion. An EPA Headquarters participant asked whether the system will create a repository of EPA final actions. Mr. Young said yes, and that this will be the system of record for the CWA 303(d) list.

A state participant asked whether the new ATTAINS system will allow other units in each state as well as the public to understand which data supports assessments. Mr. Young said probably not, adding that there was much discussion among the design team about how tightly to couple monitoring data with the assessment conclusion, but ultimately there were reservations to always providing an opportunity to second-guess the decision. He noted that the ATTAINS system provides monitoring data collected on an assessment unit, but there may be other data used for the assessment conclusion, which is what the rationale section is meant to provide.

An EPA Headquarters participant asked for the purpose of the comment fields that are not part of the rationale, especially since that exchange between EPA and a state is not privileged. Mr. Young said that he views the comment boxes as mostly being for states to keep track of the information that they need. A state participant noted that his state has been using it mostly for internal communication, but certainly nothing privileged.

Another state participant asked whether there will be a way to populate the whole thing as “same as last cycle,” and then fix only what needs to be updated that year. Mr. Young replied that the system is not fully built yet, but there is the ability to “manage cycle,” to migrate everything from a prior cycle to the current one. He added that there is a batch upload capability as well, so a user could upload a spreadsheet with information that would automatically populate the system in a batch process. Then it is just a matter of validating the changes to make sure that they are correct. This will be a new feature of this system. Yet another state participant asked whether EPA will be in touch with each state to populate the water quality standards options, to which Mr. Young responded that they likely will use the information presently available, notably the reporting history, and the states can notify EPA if there are changes to be made.

Key Points Raised:

- The transition to the new ATTAINS system will occur in the spring of 2017.
- The goal is to use ATTAINS for the 2018 Integrated Reporting cycle.
- The new ATTAINS system will contain assessment information, actions taken (e.g., TMDLs), state-wide statistical survey results, performance measures, and CWA 303(d) Vision priorities.
- Integrated Report data can be submitted to the new ATTAINS system through the Direct Data Entry system and the Exchange Network.
- All assessment units in the ATTAINS system should have a GIS reference.
- A new feature of the ATTAINS system is the ability to associate monitoring locations with corresponding assessment units, which allows greater integration of water quality data with assessment conclusions.
- The parameters section is a new concept within ATTAINS, creating the ability to convey information about the parameters not causing the impairment, as well as those that are.
- The design team is tailoring all of the dropdown lists in the ATTAINS system, from designated uses to causes of impairment, for each state, and the states should notify EPA if there are changes to be made.

Session 3: Data Discovery and Assessment Tools

This session featured two presentations, with opportunities for questions. Intended outcomes of the third session included:

- Participants will learn about digital tools being used to retrieve data and perform water quality assessments.
- Participants will be introduced to the Water Quality Portal.
- Participants will learn about the Data Discovery tool.

Dwane Young of EPA Headquarters opened the session with a brief overview of the Water Quality Portal, a cooperative service provided by EPA, the United States Geological Survey (USGS), and the National Water Quality Monitoring Council (NWQMC). He explained that the Portal is a repository for monitoring data from multiple sources and can serve as a one-stop-shop for data for TMDL development. Mr. Young noted that they saw states building automated monitoring data sites with open source software. He acknowledged that EPA could not develop a resource that would be all things for all state, tribal, and territorial water quality programs, but

that they could make core tools that could be tailored to the purposes of each jurisdiction. In introducing Wade Cantrell of South Carolina, he said that South Carolina's tool was an inspiration for EPA's work.

(1) Wade Cantrell, SC: Data Assessment for CWA 303(d) Listing in South Carolina

Mr. Cantrell began his presentation with context. He explained that he is presenting the work of the Department of Health and Environmental Control's (DHEC) Surface Water Monitoring Section, which develops the state's water quality monitoring strategy, directs field sampling, manages data, and performs the assessment for the Integrated Report. Mr. Cantrell noted that his goal for the presentation is to provide an overview of their assessment approach and why R has been useful for DHEC, as opposed to detailing the function of the tool.

Mr. Cantrell provided the basic details of their monitoring program: 250 base sites are sampled every other month; 90 sites are randomly selected each year to be sampled once per month for 12 months as statistical survey sites; and there are special request sites, such as CWA 319 project sites and sites relevant for TMDLs and permitting. He added that the state lost many stations roughly five years ago, and they are trying to get them back. Mr. Cantrell also noted that monitoring data comes from other programs within the agency and from outside sources. He said that the monitoring strategy is updated annually.

Mr. Cantrell emphasized the challenge of the assessment task: compiling monitoring results and formatting data files; determining the appropriate criteria for each record depending on the water class, water quality standard, waterbody type, and ancillary chemistry; determining exceedances, use support, and listing status station-by-station and parameter-by-parameter; performing QA/QC; and reconciling sites with TMDLs. Mr. Cantrell noted that the state blends data of different proximities and on different sampling frequencies and even different standards. He added that the assessment staff usually performs trend analyses, information that also is used to support CWA 303(d) listing.

Mr. Cantrell then explained how the state used to do assessments. Initially it was with a combination of legacy STORET tools and brute force FoxPro and Excel, which apparently took months. Later, DHEC programmers developed an assessment in C programming language and then another in SAS, which apparently did not work very well. Then WQHydro trend analysis software was lost in a fire, gutting part of the monitoring annex. In short, he said, submittals were timely, but assessments were hard. In contrast, assessment staff now use R statistical software to perform most assessment operations. Most data management is done outside of the R environment, through text files, Excel, and Access, but customizable modules and functions in R access data perform calculations, write results, and create tables that become the final assessment. He also noted that R can be used to create data plots and KML files for mapping assessment results.

Mr. Cantrell described R as a statistical computing and graphics language and environment. It is free open-source software that includes a core set of statistical packages and is highly adaptable to specific situations. He said that R works for DHEC because they did not already

have an efficient approach and were not already invested in something else; they had a talented individual on staff who overcame the R learning curve and now does the customization; and it is free, flexible, powerful, and fast. What used to take months now can take days, once the modules are set up and programmed. He then provided examples of screenshots of the steps in the process.

A state participant noted that her state also is using R, and that it has changed time requirements tremendously. An EPA regional participant asked why a geometric mean is important if a single sample maximum is used, to which Mr. Cantrell answered that R helps them evaluate the data in the study, where weekly data was taken, but they mostly can only do single sample maximums, even though they would like to do geometric means.

(2) Dwane Young, EPA HQ: The Data Discovery Tool

Mr. Young explained that the Data Discovery tool, which also runs on R, provides an interface that allows users to search, summarize, quality control, and display data from the Water Quality Portal. He emphasized that this tool is intended not to replace what states, tribes, and territories are doing, but to supplement, and learn from those other tools and methods. He said that their objective is to improve the community of tools.

Mr. Young noted that all data in the Water Quality Portal from all sources are in a common format. The user need only identify a HUC, set parameters, run the query, download the data in a zip file, and open it in Excel. The ability to copy a link and return to the exact same data result makes possible the development of applications for gathering real-time data. Mr. Young noted that the tool also provides metadata about the data set collected and offers the ability to clean up the data set through, for example, a filter that removes duplicates and non-detects. He added that the summary tab provides a summary of every station and every parameter, and the view tab creates a map of all stations and can be filtered by parameter.

Mr. Young explained that the tool, available now for free, is intended to make accessing water quality data easy. He noted that the next tool that is needed is one that will hand this data off to an assessment tool.

A state participant asked whether there are plans to include sediment data in the Water Quality Portal, to which Mr. Young answered that such data are in the Portal if they are available. That participant also asked if it is possible to link this tool with EPA Pro UCL, as it would provide more robust statistical analysis and allow for risk assessment. Mr. Young said that they can look into that. Another state participant asked whether data other than what is in the Water Quality Portal can be used, to which Mr. Young responded in the negative. An EPA regional participant noted the challenge of diverse and incomplete input data and asked whether there are efforts underway to standardize the data going into the database. Mr. Young agreed with the statement and said that there are efforts to determine how data will be entered.

Key Points Raised:

- The Water Quality Portal is a cooperative service provided by EPA, USGS, and the NWQMC to store monitoring data from multiple sources in one place.

- EPA cannot develop data-access resources that are all things for all state, tribal, and territorial water quality programs, but they are striving to make core tools that can be tailored to supplement existing state, tribal, and territorial tools and methods.
- R works for DHEC because they did not already have an efficient approach and were not already invested in something else; they had a talented individual on staff who overcame the R learning curve; and it is free, flexible, powerful, and fast.
- The Data Discovery tool, which also runs on R, provides an interface that allows users to search, summarize, quality control, and display data from the Water Quality Portal.
- The Data Discovery tool provides data from all sources in a common format, can clean the data set collected, and offers metadata about the data set.

Session 4: Effectiveness Monitoring

This session consisted of three presentations, followed by a plenary discussion. Intended outcomes of the fourth session included:

- Participants will learn a variety of approaches to effectiveness monitoring in different contexts, and results of those efforts.
- Participants will learn more about the challenges to and opportunities for effectiveness monitoring in existing networks and programs.

Rosaura Conde, EPA HQ: Assessment Goal – Effectiveness Monitoring

Ms. Conde began the session with a review of the Assessment Goal of the CWA 303(d) Vision, specifically its purpose and its connection to effectiveness monitoring. She reminded the participants that the Assessment Goal of the Vision is: “By 2020, States identify the extent of healthy and CWA Section 303(d) impaired waters in each State’s priority watersheds or waters through site-specific assessment.” She added that two of the milestones noted in the Vision document are: “States develop plans to complete ‘baseline’ monitoring to gather needed data to assess pre-implementation conditions in priority areas” by 2018; and “States develop plans to complete ‘effectiveness’ monitoring to gather needed data to assess post-implementation conditions in priority areas” by 2018. Ms. Conde also reiterated the three bins of monitoring used as working definitions in the 2015 training workshop: (1) baseline monitoring, which is monitoring performed to allow initial or ongoing assessment of waterbody-specific ambient conditions; (2) supplemental/planning monitoring, which is not explicit in the Vision but is monitoring performed, if needed, to support development of planning documents; and (3) effectiveness monitoring, which is monitoring performed to assess waterbody-specific ambient conditions post implementation activities. She noted that baseline monitoring is critical to effectiveness monitoring, because it is necessary to have information against which comparison is possible.

Ms. Conde explained that there is no one prescriptive way to monitor effectiveness. While this reality offers much flexibility when implementing the CWA 303(d) Vision, it also means that there are many options and not much clarity on how to proceed. She said that deciding on the effectiveness monitoring approach to use depends on what is being evaluated: the effectiveness of specific best management practices, the effectiveness of a combination of

practices in a watershed, or upstream or downstream changes. Ms. Conde provided four factors to consider: (1) the scale at which the changes will be measured; (2) whether a specific pollutant is being tracked; (3) whether the effectiveness of specific controls is being measured; and (4) the timeframe for data collection.

Ms. Conde emphasized that effectiveness monitoring need not be done from scratch, that it can be an extension of existing monitoring schemes. She added that a combination of monitoring approaches can be used, such as probabilistic monitoring, targeted monitoring, remote sensing, and edge-of-field testing. Ms. Conde also highlighted the importance of working with partners in the design and execution of the monitoring as well as concerning access to the subsequent data. In addition to the state monitoring program, helpful collaborators can be other federal and state agencies, academics, and volunteer monitoring networks. Ms. Conde directed participants to EPA's 2006 *Guidance on Systematic Planning Using the Data Quality Objectives Process* for more details on organizing data collection and analysis. She concluded her presentation by introducing Dr. Willis' and Mr. Kosinski's presentations as state examples of effectiveness monitoring in practice.

Larry Willis, VA: Using Probabilistic Monitoring to Assess the Effectiveness of Stream Management Efforts

Dr. Willis started his presentation with a big-picture look at effectiveness monitoring. He noted that, in the 1990s, the U.S. Congress desired to know how effectively water quality was being managed and provided funding for that research. What began as The Environmental Monitoring and Assessment Program (EMAP), run by EPA's Office of Research and Development to collect field data and develop the tools necessary to monitor and assess the status and trends of water quality, is now embodied in EPA's National Aquatic Resource Surveys (NARS). Dr. Willis said that when he thinks of effectiveness monitoring, he thinks of extremes: where water quality management has been good or effective, and where it has not.

Dr. Willis provided data from the Jackson River in Virginia as an example of site-specific monitoring of a TMDL's effectiveness, for the value of these data is in informing what impacts restoration efforts are having on a waterbody. However, he noted that if one wants to know how protection and restoration efforts across the entire landscape are going, not just one river at a time, a different approach is needed. Dr. Willis then segued into an explanation of probabilistic monitoring as a network of randomly chosen stations used to statistically assess statewide water quality conditions.

Dr. Willis detailed Virginia's probabilistic stream monitoring program, which began in 2001. He noted that the state selects 60 to 70 sites per year for probabilistic monitoring. They each are monitored once in the spring and once in the fall. Since the site selection is random, they can wind up testing places that they would not otherwise test, sometimes in difficult-to-access locations. Dr. Willis said that, in addition to chemical parameters, they analyze land use, the benthic community, fish fauna, and other characteristics at each site. He noted that the primary goal of probabilistic monitoring is to provide decision-makers with good

information, including what the main problems are across the state, where those problems are located, and how serious they are.

Dr. Willis provided some of the cumulative results of Virginia's probabilistic stream monitoring. Nearly 40 percent of river miles in Virginia do not meet biological expectations, which is close to the national average. He also noted that six of the top ten stressors are things for which the state does not manage with water quality criteria: sedimentation, total phosphorus, total nitrogen, RBP habitat, CCU metals, and ionic strength. He added that these stressors notably increase the chance of having an impaired benthic community, from three to five times more likely. Dr. Willis said that many of these issues are legacy problems or are associated with natural conditions, and there is a strong nonpoint source signature.

Dr. Willis highlighted what else probabilistic monitoring can do by explaining a 2016 report with findings that the number of streams and lakes nationwide with non-detectable levels of phosphorus have gone down in recent years. He added that independent research in Virginia has revealed similar results, but the percentage of stream miles meeting biological expectations in Virginia is trending in a positive direction over that same period.

Dr. Willis concluded his presentation with a few summary comments. He said that the effectiveness of managing aquatic resources in this country is mixed: 40 percent of streams nationally and in Virginia do not meet biological expectations, but water quality standards appear to be effective. He emphasized the need to do more to evaluate the risks to the best of what is left, and that active management of nonpoint source sediment and nutrients is relatively new.

A state participant asked whether Virginia considers the amount of rainfall when evaluating trends, adding that it is a factor that can make comparing years like comparing apples and oranges. Dr. Willis responded that they are trying to more effectively account for drought and flood years statistically. Another state participant asked what factors Virginia has controlled for in its statewide analyses. Dr. Willis noted the natural variability between, for example, swamp waters in the eastern part of the state and mountain streams in the west. He expressed concern over temperature and hydrology, as two factors that are insufficiently accounted for, but that they are trying to find the resources to better incorporate.

Yet another state participant asked whether Virginia accounts for ecoregions when setting up the probabilistic monitoring, so as to ensure that everything is being represented in the sampling. Dr. Willis said that the model attempts to spread the data points evenly across the entire state, but that stream order is weighted, with 70 percent of data points in headwaters, because 70 percent of streams in the state are first water streams, and then they adjust those weights to river miles statistically. That same state participant also asked what Virginia does if a stream is dry when staff arrive to monitor it. Dr. Willis responded by noting that probabilistic monitoring also is a sample of what streams have water in them. He noted that they might sample a stream in one year, but it is dry the next year. He also said that they do not know what their expectations should be for tidally affected stretches of rivers, where fresh and saltwater go back and forth daily.

Ken Kosinski, NY: Integration of NY's Monitoring Program into NY's Vision Approach

Mr. Kosinski explained that his presentation will cover water quality monitoring in New York, but also how monitoring has been integrated into the state's CWA 303(d) Vision approach and a tool that they have developed as part of the visioning process. Starting with the basics of the monitoring program, Mr. Kosinski said that their monitoring is focused mostly on surface water, but it does cover groundwater to some extent. He added that monitoring is performed on a five-year cycle, covering two or three of the state's seventeen basins each year. But the work in each basin is not limited to one year; they do a screening in year one, intensive monitoring in year two, and perform assessments and develop protection and restoration strategies in years three through five.

Mr. Kosinski described their Citizen Statewide Lake Assessment Program (CSLAP), which has been in existence for 30 years. Through CSLAP, the state trains people to take ambient water quality samples, and the results data are incorporated into assessments. As of 2016, roughly 130 lakes in New York are monitored by CSLAP volunteers. For rivers and streams, Mr. Kosinski said that the state has the Water Assessment by Volunteer Evaluators (WAVE) program, through which the state trains people to do biological assessments.

Mr. Kosinski then focused his remarks on the state's approach to implementing the CWA 303(d) Vision. He noted that monitoring played an important role in their visioning process: from evaluating the level of impairment of waterbodies, to helping to organize waterbodies, to assessing recovery potential, to tracking progress toward improvement. He added that they wanted to use this data to help integrate the programs. Mr. Kosinski said that New York prioritized nutrients, pathogens, and dissolved oxygen, focusing specifically on public health, thus public drinking water supplies, primary contact recreation, and shellfishing. The state developed scoring criteria for each metric, to help in the prioritization of waterbodies. All waterbodies on the CWA 303(d) list and all public water supplies were scored, and then the state considered qualitative information, such as the recovery potential of the waterbody, the feasibility of TMDL development, and the presence of an active watershed association.

Mr. Kosinski concluded his presentation by highlighting the TMDL-Lite tool that they developed as part of this process, to help visualize and indicate the relative pollutant load contribution by source, determine waterbody potential recovery response, and identify the most appropriate watershed management approach. He said that it is a simple model that covers the major aspects of a TMDL analysis. It estimates stormwater loads based on land use, precipitation, and simple hydrology; and it estimates septic nutrient load based on the population served by septic systems and their proximity to surface waters. Mr. Kosinski provided two examples of the TMDL-Lite as compared to the results of the more sophisticated models for TMDL development, and they were quite close.

A state participant asked whether TMDL-Lite considers in-lake loadings, to which Mr. Kosinski responded that they have not but are working with the lake services group to do that. That same participant also asked whether New York has used the TMDL-Lite tool in a public setting and what the response has been. Mr. Kosinski said that they have not done that yet. An EPA Headquarters participant asked what happens after the TMDL-Lite analysis. Mr. Kosinski replied

that they score the waterbodies and then consider factors such as the presence of a watershed group and the recovery potential of the waterbody before deciding whether to target the waterbody.

Session 4 Plenary Discussion:

Noting that the presentations regarding Virginia and New York were meant to be the start of a more extensive sharing of experiences with effectiveness monitoring, Mr. Schempp of ELI posed the first of the discussion questions to the participants: in what other ways have your programs conducted effectiveness monitoring, and with what success?

A state participant explained that most of the monitoring in her state has been targeted monitoring, especially around TMDL development and TMDL implementation, but they have undertaken effectiveness monitoring in a few instances. In one particular pond, a CWA 319-funded project location, project partners conducted studies to document nutrient loading from the commercial cranberry bogs and study the feasibility of using low-phosphorus fertilizers to maintain yields while reducing nutrient loading for the impaired pond. The effectiveness monitoring, which occurred before and after TMDL implementation, showed that reducing the amount of phosphorus fertilizer applied to bogs and diverting nutrient-laden discharge improved water clarity in the pond and reduced total phosphorus concentrations by 40 percent. She added that, in one of the state's rivers, an eight-year visual observation-based monitoring program following the completion of a TMDL to address phosphorus and the upgrade of several wastewater treatment plants revealed significant reductions in phosphorus concentrations and the presence of the floating macrophyte duckweed.

Another state participant said that a water quality standards exceedance was identified across state lines using USGS data. The neighboring state developed a TMDL for nutrients, and her state began issuing permits for nutrients. She noted that they have been monitoring that problem and are very close to delisting the waterbody. A third state participant noted that most of her state's effectiveness monitoring comes from the watershed protection group during TMDL implementation, adding that, once the watershed-based plan is done and some restoration is actually happening, stakeholders and team members monitor the effects.

A fourth state participant described her state's rotating basin approach to monitoring and highlighted the fact that they are now to the point of revisiting basins that previously have been monitored, a built-in means of monitoring effectiveness. She said that progress is being made in most cases, particularly where many point sources were involved. She added that, if they dedicated a significant amount of CWA 319 funds to an area, they are doing follow-up monitoring to ensure those projects are actually working. A fifth state participant explained that her state has been doing extensive monitoring of one of the state's bays, which is a shellfishing area, to assess improvements resulting from nutrient upgrades at a wastewater treatment facility. To determine the impacts of CSO abatement, the state conducts post-storm bacteriological monitoring of the bay, and other partners collect data from beaches and non-shellfishing waters. Since these projects have cost hundreds of millions of dollars, she said, the state wants to be able to show incremental improvements in the resource as quickly as possible. A sixth and final participant noted that his state has been most successful in assessing improvement when the

source is livestock feeding areas or septic systems, but they have not been as successful in showing improvement when dealing with nutrients because of the voluntary nature of restoration efforts.

Key Points Raised:

- A combination of approaches, such as probabilistic monitoring, targeted monitoring, remote sensing, and edge-of-field testing, can be used to monitor the effectiveness of water quality improvement efforts.
- Factors to consider when selecting how to monitor effectiveness include: (1) the scale at which the changes will be measured; (2) whether a specific pollutant is being tracked; (3) whether the effectiveness of specific controls is being measured; and (4) the timeframe for data collection.
- Virginia's probabilistic stream monitoring program analyzes chemical parameters, land use, the benthic community, fauna, and other characteristics in each of 60 to 70 randomly-selected sites per year, with the primary goal of identifying the main problems across the state, where those problems are located, and their severity.
- A rotating basin approach to site-specific monitoring is a built-in means of conducting effectiveness monitoring, once the first rotation is completed and the basins are being monitored again.
- The expense of a project can prompt demand for the demonstration of improvement, and hence effectiveness monitoring.
- Monitoring can play an important role in the visioning process: from evaluating the level of impairment of waterbodies, to assessing their recovery potential, to aiding in the organization and prioritization of waterbodies, to tracking progress toward improvement. New York developed scoring criteria and uses a simple modeling tool, called TMDL-Lite, to help in the prioritization of waterbodies.

Session 5: Monitoring Data Challenges and Solutions

This session consisted of facilitated discussion founded on a series of questions and the presentations from the fourth session. Intended outcomes of the fifth session included:

- Participants will learn about effective methods for collaborating with the monitoring program.
- Participants will learn how others prioritize their data needs.
- Participants will learn about potential additional sources of monitoring data and how others have procured those data.

Adam Schempp of ELI began the session with a brief review of the responses from the registration materials regarding monitoring. He noted that, when asked where (geographically) effectiveness monitoring has occurred or likely will occur, participants answered both where it "has occurred" and where it "likely will occur." Mr. Schempp said that the more interesting answers concerned where effectiveness monitoring "has occurred." In this regard, "CWA 319 project locations" was the most common answer, closely followed by the more generic statement of "where implementation has occurred," which may include CWA 319 projects. "Ambient monitoring stations" also was a common answer, followed by "locations with TMDLs."

Mr. Schempp addressed the next monitoring question: “If relevant, what assistance would support your efforts to develop effectiveness monitoring plans?” He said that the four most common answers, in order, were: “good examples,” “resources for monitoring or plans,” “technical support,” and “guidance.” He noted that, while “good examples” was a common response, what were interesting were the types of examples requested. Participants asked for examples of effectiveness monitoring plans that address: slow restoration; fast restoration; complex problems; simple problems; inland and coastal areas simultaneously; bad as well as good examples; and issues with narrative criteria. Participants also requested examples of a QAPP used for municipalities and volunteer organizations to provide data as well as CWA 319(h) BMP effectiveness monitoring for streambank restoration detention basin retrofits, etc. Other requests included examples of: monitoring design and robust statistical analysis; how to evaluate project-scale BMPs; how to decide where to monitor; how to incorporate effectiveness monitoring into existing networks and programs; other data sources; and facilitating citizen science.

Mr. Schempp then conveyed the ways that CWA 303(d) and monitoring programs have coordinated. He noted that the most common answer was agency structure, that the two programs are under the same division or section. Another common answer was regular coordination regarding monitoring needs, whether through calls or meetings. Less common answers included: CWA 303(d) staff provide field support; CWA 303(d) staff review the monitoring plan; and the physical proximity of the staffs of the two programs. Mr. Schempp then explained the many other sources of data, not from the monitoring program, on which CWA 303(d) programs rely. He said that “volunteer and/or watershed groups” was the most common answer, closely followed by federal agencies and other state agencies. Permit holders, universities, local government, bordering states, and tribes also were mentioned. Mr. Schempp added that the USGS was, by far, the most common source of data noted from other federal agencies, but twelve other agencies or programs were noted. In conclusion, Mr. Schempp noted that a significant number of participants indicated that they use external data for assessment purposes, TMDL development purposes, or both, but few mentioned that they use it for determining effectiveness.

Session 5 Plenary Discussion:

The discussion started with Mr. Schempp posing to the participants one of the questions from the prior session: “In order to track and document success, what is the greater need: more data faster or more controls and a longer timeframe?” A state participant said that she spoke with staff from the program that does their effectiveness monitoring, and their response was “more controls and a longer timeframe” because best management practices often take a long time. Many participants supported that response. Another state participant said that her response depends on what is being done. She gave an example of a situation in which she would answer “more data faster,” because interested parties want to know what is going on from year to year, and even on a daily basis. A third state participant expressed the need to highlight more controls and provided an anecdote: his state put many resources into addressing a small waterbody, and ten years later they have just started to see reduction in nutrients and sediments. A fourth state participant answered that it depends on the question. He gave two examples: (1) for a pesticide partnership

program, timely data is important for influencing pesticide application in the next growing season; but (2) for flow restoration, the channel work and responses will take a long time.

Mr. Schempp asked that participant how his state determines when, after implementation has started, effectiveness monitoring should occur, to which he responded that modeling helps. He explained that they are linking the landscape condition to modeling processes, using tree growth to predict what sort of effect, including in water quality, to expect in 10 or 15 years. Another state participant noted that her state continues to monitor on a rotating basis, but they have struggled with how to measure change, because many of the issues are long-range nutrients problems. She added that it has been very hard to convey to the public the need to put resources into this problem when no change is being seen; they are struggling with demonstrating incremental progress. A third state participant said that they have developed a clean boating campaign to address petroleum pollution from motorboats, and while it has increased awareness of the problem, they expect that a notable change will not happen until two-stroke engines are prohibited, at which point the restoration may be quick. A fourth state participant explained that they generally do effectiveness monitoring immediately upon implementation of a CWA 319 project, to provide feedback and either re-evaluate a TMDL or develop a TMDL later. A fifth state participant added that, when monitoring CWA 319 and mine drainage restoration efforts, they first determine how much implementation has gone into the watershed, one project versus many. If there has been significant restoration effort, they will monitor five years later to check for improvement. A sixth state participant said that they respond to requests for subsequent monitoring when the stakeholder believes that the waterbody has been restored or significantly improved.

Mr. Schempp then asked the participants how, if at all, their CWA 303(d) programs prioritize their data needs, and what tools, procedures, agency structures, or other means of communicating those data priorities, to the monitoring program and other data providers, they have found to be valuable. A state participant responded that he works with the CWA 319 program to develop a master target list when the monitoring program is planning for the next fiscal year. That list is composed mostly of data gaps from assessments and CWA 319 project sites. He added that his state has performance coordinators who track which waters are expected to improve over the next five years and annually identify which waters we target in monitoring. Another state participant explained that a group of supervisors and managers in her state discuss their collective monitoring needs every month or two. A third state participant noted that his state recognized how important it is to see the gaps in assessment when prioritizing waters, and thus their CWA 303(d) Vision implementation has involved close collaboration with the monitoring program. He added that they need a couple years of monitoring to get a handle on what is impaired.

Referring back to Mr. Schempp's introduction to the session, a state participant asked what constituted "same management" when discussing coordination with the monitoring program. How close is that relationship? Mr. Schempp replied that the answers varied and some of them were vague in that regard. Another state participant said that the connection level in her state is across the hall and that staff of the different programs tend to work together to identify needs, which are then relayed to supervisors and often approved. She added that it is one of the benefits of having a small program. Another state participant explained that his boss oversees TMDLs,

and two monitoring chiefs sit next door, noting that it makes discussions about data needs in the coming year quite easy. A third state participant said that she manages the group that establishes water quality standards; two monitoring groups, for the northern and southern parts of the state; the assessment group; and the TMDL group. She continued by noting the coordination with the monitoring group every fall about where TMDLs have been developed and what the priorities are. A fourth state participant highlighted a coordinated effort in his state to have an intern perform a big spatial analysis on monitoring holes, which will be used to help prioritize competitive grants for citizen monitoring.

A state participant explained that they do a significant amount of public outreach as part of developing a monitoring plan, including holding meetings where members of the public can mark on a map where they believe indicators to be. She added that this information has helped them to effectively focus their efforts. Mr. Schempp noted that this serves as a good transition to the question of where, other than the monitoring program, participants have been getting data. A state participant responded that other divisions of their department monitor fish populations, beaches, shellfish sanitation, and parks, and he added that they recently clarified their policy for the use of third-party data. Another state participant noted that one of their rivers is undergoing remedial investigation, and her office has been collaborating in the collection of core, surface, sediment, sub-sediment, and fish-tissue samples for the remedial investigation, to use them to inform TMDL revisions. A third state participant noted that they are expecting to receive information from a National Science Foundation-funded project that researchers at the University of Rhode Island, University of Delaware, and University of Vermont are conducting on stream sensors. She added that universities can be resistant to sharing data until the papers are published.

A state participant highlighted the value provided by the Southeastern Aquatic Resources Partnership (SARP), particularly with regard to habitat restoration, flow, and water quality. An EPA Headquarters participant noted that SARP is one of 18 partnerships of the National Fish Habitat Partnership, a phenomenally networked ally for Clean Water Act purposes. He suggested that participants look up their local partnerships. He added that 80 percent of their budget from the federal government alone reaches the ground for restoration and protection efforts, and they leverage many times the millions of dollars they receive each year.

A state participant followed this discussion by asking whether there has been dialogue between EPA Headquarters and the Department of the Interior agencies, other than the USGS, regarding monitoring data. An EPA Headquarters participant responded that there is an effort to get biological data into the Water Quality Portal. She added that they have not developed a list of agencies to pursue, but that it is a great idea. A different state participant asked whether there has been an effort to get CERCLA and RCRA Ecological Risk Assessments data into the Water Quality Portal. The EPA Headquarters participant responded that they have had periodic discussions with the waste management program to get water data into the portal, but their success has been on a project-by-project, and in some cases region-by-region, basis. An EPA regional participant explained USGS's NOREAST project, a compilation of real-time temperature data, and USFS's NORWEST project. He said that they are not comprehensive, but that they contain a lot of useful temperature data.

A state participant noted that four interstate river basin commissions have authority in his state, and that they have been big sources of data. He added that when they solicit other agencies and watershed groups for data, they often receive no response, a problem for which they would appreciate suggestions for solutions. Another state participant responded that they have gotten more out of volunteer monitors since investing in laboratory capacity for them. He added that, early in the program, the volunteer monitors would collect data that interested them, not always the data that the state needed, but he said that they have built good capacity with a lot of the groups now, and they are getting more of the data that they need.

A state participant noted that they recently launched an external data framework, which describes how data is qualified and helps organizations develop QAPPs, and a portal for entering the data. He added that they provide an advanced option to work with their chemist and do an Electronic Data Interchange input sheet. Another state participant noted that they formed a water quality monitoring council six years ago, and they have a biennial conference. He said that the face-to-face contact between the Army Corps, U.S. Forest Service, and others has really facilitated data sharing, adding that the conferences provide a great deal of information about current university research as well. A third state participant also praised the virtues of his state's water quality monitoring council and noted that they developed an environmental data exchange network for surface water quality data. While the network has attracted much data, he noted the concerns of some tribes in contributing data that would wind up in an EPA system. Another state participant explained that they rank data not from the department into tiers. They use tier three data for assessment. Tier two data can be the same quality as those in tier three, but the department has agreed not to use it for assessment or TMDLs. Tier one data are just used for a little extra perspective.

An EPA Headquarters participant concluded the session, and provided a bridge to the next session, by noting that, while the focus the discussion was on impaired waters, monitoring data also could be used to tell the story about waterbodies that are in good condition and the effectiveness of actions taken to keep them there.

Key Points Raised:

- According to pre-workshop responses, the majority of effectiveness monitoring activities currently are happening in the CWA 319 program, and there is a need for examples of effectiveness monitoring approaches and tools, such as QAPPs.
- Coordination between the CWA 303(d) and monitoring programs occurs in many ways, from agency structure and the physical proximity of the staff of the two programs, to regular calls or meetings, to established procedures such as CWA 303(d) staff reviewing the monitoring plan.
- In addition to data from the monitoring program, CWA 303(d) programs rely on data from such varied sources as other programs within the agency, other state and federal agencies, bordering states, interstate river basin commissions, tribes, local governments, universities, permit holders, and watershed groups.
- Monitoring conferences and water quality monitoring councils aid data collection and coordination by providing face-to-face contact between relevant agencies, academic researchers, and other data contributors.

- Online data collection and storage tools can clarify, simplify, and unite data submission, access, and quality assurance processes, ultimately improving the amount and usefulness of data from varied sources.
- Providing laboratory capacity for volunteer monitors can increase the amount of data from this source and help direct where and what data are collected.
- Knowing when to monitor effectiveness is difficult and depends heavily on the problem and solution, but scenario modeling, responding to monitoring requests from stakeholders, building on experience, and learning lessons from others can help.
- For many restoration efforts, having more controls and a longer timeframe for tracking and documenting success are critical, but in some instances, particularly when regular water quality data is needed to direct near-term activities or the public wants proof of incremental improvement, having more data faster is the more necessary program development.
- Monitoring also is needed to tell the story about waterbodies that are in good condition and how to keep them there.

Session 6: Protecting Healthy Waters

This session consisted of one presentation, followed by a plenary discussion. Intended outcomes of the sixth session included:

- Participants will learn about and discuss different ways of implementing the Protection Goal.
- Participants will learn about the content and state-specific products coming from the ongoing Preliminary Healthy Watersheds Assessments.

Doug Norton, EPA HQ: A Preliminary Conceptual Framework for the CWA 303(d) Vision's Protection Goal

Mr. Norton started the session with a brief summary of what protection is. He provided the dictionary definition of the term: "An act of protecting or the state of being protected." Mr. Norton then offered examples of protection practices, including acquisition techniques, such as fee simple acquisition, conservation restriction acquisition, and agricultural preservation restriction acquisition, and restriction techniques, such as outstanding state and national resource waters, areas of critical environmental concern, local wetland ordinances, zoning restrictions, and buffer zone restrictions.

Mr. Norton sought to clarify EPA's expectations regarding protection, noting that protection is well-established but not required in the Clean Water Act. He added that it is being promoted by EPA, as indicated by its inclusion as a primary goal in the CWA 303(d) Vision. However, it is a relatively new concept for the CWA 303(d) program in particular, and it has prompted significant interest but also uncertainty about the scope of protection actions and EPA expectations from states, tribes, and territories. He added that EPA wants to assist states, tribes, and territories in planning and implementing protection efforts.

Mr. Norton then noted that, in addition to protection itself, the actions leading to protection are important and encouraged. He outlined a conceptual framework for protection, founded on the three elements of assessment, planning/prioritizing, and protection implementation. He explained the first element as assessment of waterbodies for the purpose of protection, the gathering of the information necessary to decide which waters or watersheds are good candidates for protection. He said that assessment can occur on a comprehensive statewide or single waterbody basis, and this might involve the state, tribe, or territory compiling condition information, such as water quality and the magnitude and type of threats. Mr. Norton commented that, in some cases, good waters for protection are being found as part of ongoing watershed projects, as opposed to a comprehensive list being whittled down to find suitable protection waters, adding that either approach is workable. He also stated that, whereas protection is primarily about maintaining relatively healthy waters to keep meeting standards, targeted watersheds may have a few impaired segments among predominantly healthy waters. This kind of situation can present an opportunity to integrate restoration and protection. He noted that, ultimately, assessment should help the state identify candidate protection areas and provide useful information for considering protective actions and priorities.

Mr. Norton described the second element as planning and prioritizing; which includes prioritizing waterbodies for protection (drawing from assessment findings) and developing a planning process that identifies protective actions and their anticipated effects on specific waterbodies. He suggested that protection planning should generate sufficient waterbody-specific information to describe the intended actions and desired results. Mr. Norton added that, as indicated by participant responses in the registration materials, many states are taking steps toward protecting at least some waterbodies on a case-by-case basis, and usually as part of existing processes, such as watershed TMDLs and watershed-based plans. Also, several states are framing protection plans, but there still is much uncertainty surrounding them, and a few states are identifying protection priorities as part of the prioritization goal.

The third element, as explained by Mr. Norton, is the actual implementation of the protection activities, which he defined as “actions that are expected to change the protection status of a waterbody for a definable timeframe.” He noted a few examples of implementation from the registration materials, mostly collaborations with other agencies or organizations. He stressed the value of partnerships with entities like SARP that already are focused on protection and may have protection authorities or resources complementary to those available to a state or territorial CWA 303(d) program.

Mr. Norton then shifted the focus of his presentation to Preliminary Healthy Watersheds Assessments (PHWAs), which EPA is compiling to assist states in the protection assessment stage described above. PHWAs document several primary characteristics associated with watershed health and provide health index scores for all the watersheds across the state. In addition, each statewide PHWA will document relative risks to these watersheds in a vulnerability index score. He explained that EPA refers to them as “preliminary assessments” because they are using the Healthy Watersheds program's detailed assessment methodology on a more generalized basis, to provide a framework of watershed health information for nearly all states in a short amount of time (2016). PHWA results will be delivered to each

state and will include ecoregion-wide as well as statewide comparative scores of watershed health and vulnerability. Mr. Norton provided an example from West Virginia, noting that the ecoregion-wide perspective sometimes tells a different story about good watersheds for protection than looking statewide alone. He said that this information represents the overall condition well. Mr. Norton noted that the index of watershed health has relied on six factors: landscape condition, hydrology, geomorphology, habitat condition, biotic condition, and water quality. He added that they also are documenting watershed vulnerabilities, through factors like landscape change, water use change, and fire risk.

Mr. Norton detailed the intended applications of these assessments as being: to help states set priorities and leverage programs and partners; contribute more comparable national health data; inform the regional-state dialogue; and increase public awareness and support. He concluded his presentation with a request that anyone interested in the Preliminary Healthy Watersheds Assessments come speak with him any time during the week.

Session 6 Plenary Discussion:

Before engaging participants with a series of common questions on protection, Mr. Norton fielded questions regarding his presentation. A state participant expressed concern over combining protection monitoring with ongoing monitoring, adding that everyone wants monitoring everywhere all the time, and this could dilute the ongoing monitoring. Mr. Norton acknowledged the concern and questioned whether monitoring should be required, but he noted that generating monitoring data where possible is a good thing. Another state participant asked what the numbers on the chart of example outputs from Preliminary Healthy Watersheds Assessments indicate, to which Mr. Norton replied that they are percentiles, like a report card.

Mr. Norton then asked the participants what an action should “protect” in water quality standards terms, to parallel how a TMDL “restores” a waterbody to water quality standards. A state participant suggested looking at antidegradation in another way and focusing on outstanding waters. Another state participant noted that his state identifies a “Tier 2.5” for glacial lakes, adding that he already has made a list of these waters for protection and intends to use biological data to reveal critical conditions that would serve as the basis for protection. A third state participant said that they interpret protection to be actions that keep loadings or water quality the same. He also explained that his state is attempting to treat protection like restoration in their processes, like reporting protected waters every two years, placing such waters in Category 4 if they do not have sufficient assurance of protection. A fourth state participant questioned whether limiting or reducing permitted discharges in healthy waters would qualify as protection. A fifth state participant suggested writing protection plans for uses, like TMDLs are written for pollutant criteria, and a sixth state participant suggested site-specific narrative criteria for this purpose.

Mr. Norton thanked the participants for their thoughts and asked what is considered “planning” or a “plan” in a protection approach. A state participant said that it could look like a TMDL, including a load allocation or documentation of the situation, so as to provide a target for permitting. She added that a protection plan should include maintenance of certain landscape conditions. Another state participant noted that her state gives unimpaired waters load allocations anyway. She emphasized the importance of specific standards and clear expectations for the sake

of accountability and communication with the public. A third state participant noted that his state requires protection and that protection plans are required to have reduction goals just like TMDLs. A fourth state participant suggested including protection TMDLs in WQ-27. A fifth state participant indicated a preference for a long-term document with institutional effect, ideally listing local ordinances, stream setbacks, and other protective measures. She added that the actions should matter more than the appearance or form of the “plan.” A sixth state participant emphasized leveraging other agency planning efforts that are broader than just water quality and made a pitch for Conservation Action Planning, as used by The Nature Conservancy. A seventh state participant highlighted the value of educating stakeholders and the public that the watershed is healthy and what can be done to protect it.

Mr. Norton transitioned the discussion to the next common question about protection: “What is EPA’s role in evaluating state-submitted protection approaches?” A state participant recommended a similar approach to that being used for “alternatives.” Several state participants emphasized the value of collaboration and support, rather than evaluating whether the plan is sufficient. One of those individuals requested EPA to highlight the value of protection, particularly as long-term cost savings, in national outreach. Another state participant recommended the development of a communications document. An EPA regional participant suggested that the states, tribes, and territories begin conversations with the regions sooner rather than later, even if protection is only a consideration at the moment, noting that early communication is likely to improve the outcomes.

Mr. Norton then asked the participants what timeframe protection should address. A state participant said that it should be indefinite, since standards are to be maintained once they are met. Another state participant suggested that the time horizon may depend on the situation, noting that lessons may be learned as the program gains experience with protection plans, such as the likely longevity of a particular plan before those protections may break down. A third state participant said that the issue lies not in the strength of the plan but in the extent to which the waters being protected are regulated, adding that degradation is likely to occur as a result of nonpoint sources. She quickly noted that a protection plan concerning nonpoint sources is not inherently bad, just that its resilience and longevity may not equal that of plans founded on regulatory authority.

Mr. Norton asked the participants how to include protection in WQ-27 and WQ-28. A state participant noted that there is an important difference between having a plan in place and implementing it. He suggested that a good protection plan is one that identifies and prioritizes what is going to be done in certain places, but it is not until the land is sought to be used in a contradicting fashion or discharges are proposed that implementation truly is meaningful. Mr. Norton provided the computational guidance language for the two measures regarding protection. For WQ-27, a protection approach is described as: “A planning process and/or a set of practices pursued in the near-term that are designed to maintain water quality standards for waterbodies that have been assessed and are attaining...” The WQ-28 computational guidance states: “This measure will also track actions that are part of the process that leads to a... protection approach.”

Mr. Norton concluded the session by asking how protection and restoration should relate and interact. A state participant said that this has been done rather well in some watersheds, addressing protection and restoration simultaneously through TMDL development. Another state participant questioned whether the CWA 303(d) program is the appropriate forum for this effort, suggesting that water quality standards might be a better place.

Key Points Raised:

- Most states are protecting at least some waterbodies on a case-by-case basis, and usually as part of existing processes, such as watershed TMDLs and watershed-based plans.
- Several states are framing protection plans, and a few states are identifying protection priorities.
- EPA has outlined a conceptual framework for protection with three stages: (1) assessing waterbodies for protection purposes; (2) prioritizing waterbodies for protection and developing a planning process; and (3) implementing planned protection actions.
- Assessment should be done in a way that helps identify candidate protection areas and provides useful information for considering protective actions. Comprehensive, statewide approaches and case-by-case approaches to assessment both can produce useful results.
- While there is significant flexibility in the form and content of protection plans, they likely will be most effective if they contain sufficient waterbody-specific information to describe the intended actions and desired results.
- Specific standards and clear expectations under the Protection Goal are important for accountability and communication among states, tribes, territories, EPA, the public, and protection partners. The bases for evaluating and recognizing effective protection are as yet unclear, but potentially could involve current loadings or water quality conditions, critical conditions as determined by biological data, water quality standards, or other metrics.
- EPA plans to develop materials that will address state questions about protection approaches and clarify the main elements of interest.
- Protection plans and their outcomes likely will be improved by early conversations between the EPA regions and states, tribes, and territories.
- EPA intends to have Preliminary Healthy Watersheds Assessments for the lower 48 states by the end of 2016. Having more comprehensive, statewide information on watershed health will provide each state with a better foundation to evaluate and move forward with protection priorities and case-by-case protection actions on individual waters.
- The Preliminary Healthy Watersheds Assessments' index of watershed health relies on the six factors of landscape condition, hydrology, geomorphology, habitat condition, biotic condition, and water quality. The index of watershed vulnerability will rely on land use change, water use change, and fire risk.

Session 7: Alternatives – Work in Progress

This session featured five presentations. Intended outcomes of the seventh session included:

- Participants will better understand the multiple expectations of a watershed-based plan that is designed for both CWA 319 and CWA 303(d) program purposes.

- Participants will learn about an example of coordination between a state and an EPA region in the development of an innovative alternative approach.
- Participants will learn various ways that states, tribes, and territories have addressed water quality problems significantly or completely in the absence of a TMDL.

(1) Menchu Martinez, EPA HQ: Alternatives under the CWA 303(d) Program Vision – A Few Key Reminders

Ms. Martinez started her presentation by noting that the main criterion for an alternative restoration plan consistent with the Vision is a near-term plan or description of actions, with a schedule and milestones, that is more immediately beneficial or practicable to achieving water quality standards. She added that the Integrated Reporting Memorandum provides considerations to help explain how the alternative restoration plan is designed to meet water quality standards. Ms. Martinez noted that there is no one-size-fits-all description of an “alternative,” and not all considerations listed in the memorandum need to be covered. She stressed the importance of the circumstances, such as public support, and suggested that participants approach an “alternative” as an opportunity to provide the roadmap for meeting water quality standards.

Ms. Martinez reminded the participants that the development of TMDLs is still a statutory obligation, and when an “alternative” is considered, the first question should be whether a TMDL would be more effective in meeting water quality standards in the near-term. Ms. Martinez highlighted that “alternatives” are not undertaken in lieu of TMDLs, and it is important to make this clear when pursuing an “alternative.” Waterbodies with “alternatives” shall remain on the CWA 303(d) list until water quality standards are met or a TMDL is developed. Ms. Martinez added that such a waterbody may be assigned lower priority for TMDL development while an “alternative” is undertaken, but TMDL development cannot be deferred indefinitely.

Ms. Martinez then clarified the relationship between Subcategory 5-alt and the WQS-27 and WQ-28 measures. She explained that Subcategory 5-alt is an organizing tool for purposes of facilitating stakeholder engagement, providing transparency to the public, and simplifying the tracking of alternative approaches. Whereas, Ms. Martinez continued, when a state or territory desires to have an “alternative” included in the measures, EPA will review the plan to determine if it sufficiently demonstrates that it is designed to meet standards. She noted that this review is separate from EPA review of the CWA 303(d) list.

Ms. Martinez concluded her remarks with a focus on timing. She explained that there is no baseline for when water quality standards must be met as a result of the “alternative,” because every impairment situation is unique. But, she added, the plan should indicate the expected timeline for restoration, and the state or territory should periodically evaluate if there is sufficient progress in water quality or in implementation towards meeting water quality standards. Ms. Martinez said that the waterbody should be re-prioritized for TMDL development if it is not on track for meeting water quality standards. In addition, EPA will be evaluating whether the “alternatives” included under the measures as of 2022 should continue to be so documented.

(2) Lynda Hall, EPA HQ, and Jim Havard, EPA HQ: Coordination between the CWA 319 and CWA 303(d) Programs on Alternatives

Mr. Havard began this two-person presentation by laying the groundwork for it. He noted that several states have expressed interest in submitting CWA 319 watershed-based plans as “alternatives” in the context of the WQ-27 measure of the CWA 303(d) program. Mr. Havard explained that EPA’s review of watershed-based plans will differ for CWA 319 and CWA 303(d) program purposes. For the former, the primary role of regional review is to confirm that the plan meets the nine minimum elements and is thus eligible for implementation with CWA 319 funding. For the latter, the purpose of review is to determine whether the plan is consistent with the CWA 303(d) Vision and would be counted under WQ-27. Ultimately, added Mr. Havard, the plan needs to be designed to meet water quality standards in impaired waters.

Ms. Hall then took to the podium to provide more detail, particularly from the perspective of the CWA 319 program. She explained that watershed-based plans are both: (1) the technical plan guiding work related to pollutant loads, sources, critical areas, and practices that will have the greatest impact on water quality; and (2) a critical approach for engaging affected stakeholders and landowners in the restoration process. She added that the projects do not happen without the engagement of local landowners. Ms. Hall noted that the review process for watershed-based plans under the CWA 319 program is different than review processes in the CWA 303(d) program: EPA’s CWA 319 program does not have an official approval role for watershed-based plans, but EPA will look at them occasionally to ensure that the elements are successful. As per the CWA 319 guidelines, the EPA regions are to review at least one watershed-based plan per state per year, but, she added, many regions are going beyond this minimum expectation to ensure that the plans are ready for implementation.

Ms. Hall said that the EPA regional nonpoint source staff will continue to provide technical reviews of watershed-based plans for CWA 319 program purposes, and EPA regional CWA 303(d) program staff will take the lead for reviewing watershed-based plans submitted for consideration as “alternatives” under the CWA 303(d) program measure. She emphasized the value of EPA regional staff from these two programs talking to each other about these plans and encouraged them to develop their own process, at the regional level, for coordinating reviews for CWA 319 and CWA 303(d) program purposes. Ms. Hall then provided a few examples, where the results of reviews align or would benefit from further dialogue between the two programs.

(3) Richard Wooster, EPA R6: Region 6 Coordination on Reviewing NPS-only Watershed Plans as Category 5-Alternatives

Mr. Wooster described how EPA Region 6 coordinates the review of applicable watershed-based plans for purposes of the CWA 319 and CWA 303(d) programs. He began by acknowledging that coordination is difficult, from determining who should be included, to how often to meet, to the process to use. He explained that, in EPA Region 6, the nonpoint source section holds monthly meetings that include TMDL and CWA 303(d) coordinators as well as state project officers to improve their alignment and reduce redundancy.

Mr. Wooster described the process that EPA Region 6 will be using for reviewing restoration plans for nonpoint source-only impaired waters, for Category 5-alt consideration. First, the region will determine if the plan is either a watershed-based plan or watershed protection plan. If yes, the plan is sent to the Nonpoint Source State Program Manager for a review for consistency with the nine elements, and the Nonpoint Source State Project Officer is notified. If the plan is not a watershed-based plan or watershed protection plan, the plan is sent to the State CWA 303(d) and TMDL Coordinator for a review of the eight considerations listed in the Integrated Reporting Memorandum, and the Nonpoint Source State Program Manager, Nonpoint Source State Project Officer, and the CWA 106/604(b) Project Officer are notified. If the plan meets the nine-element requirements or the Integrated Reporting Memorandum considerations, depending on where it was sent, an acceptance letter is sent to the state, and the Nonpoint Source State Program Manager, Nonpoint Source State Project Officer, and the CWA 303(d) & TMDL Coordinators are notified. If the plan does not meet the nine-element requirements or the Integrated Reporting Memorandum considerations, depending on where it was sent, a comment letter is sent to the state, and the Nonpoint Source State Program Manager, Nonpoint Source State Project Officer, and the CWA 303(d) & TMDL Coordinators are notified. Mr. Wooster concluded by highlighting the importance of maintaining open lines of communication and that each restoration plan is a case-by-case scenario.

(4) Laura Johnson, NE, and Tabatha Adkins, EPA R7: Nebraska's Approach to Alternatives and the Collaboration with EPA Region 7

Ms. Johnson began the presentation with a brief description of her program, noting that the TMDL staff is only half of a person, so limited in capacity; that TMDL funding comes from CWA Section 106, so there is no requirement for implementation; and that collaboration is central to implementation. She also explained that one quarter of the impairments in the state concern *E. coli*, so the state is prioritizing those impairments. Ms. Johnson recounted the traditional restoration path in the state as: the development of a TMDL with little input and no buy-in from area landowners; the developed TMDL then waits until a project sponsor wishes to restore the waterbody; and the sponsors then take key information from the TMDL and re-do the majority of the document in the plan and project. She added that, if water quality partners want to restore a waterbody without an approved TMDL, they either must wait several months or move forward without a TMDL.

Ms. Johnson recognized the duplication of effort between TMDL and watershed-based plan development in her state, including the waterbody description, watershed characterization, pollution source identification, mapping point and non-point sources, and public involvement, and she had the idea to merge these efforts by submitting watershed-based plans for inclusion as an "alternative" under the CWA 303(d) program measure. She noted that the CWA 319 staff expressed concern about the possibility of being delayed by an EPA TMDL review and approval, and project sponsors were concerned about the scope of the project possibly changing and a lack of expertise to do the work. Ms. Johnson said that she offered to develop and provide additional components to the CWA 319 staff for inclusion in watershed-based plans so the plans could be included as "alternatives" under the CWA 303(d) program measure.

Ms. Adkins said that the EPA Region 7 staff had to be coordinated to make sure that the approach proposed by Ms. Johnson would work for EPA. Ms. Adkins noted that they discussed the positives and negatives of the approach, and they worked through the challenges. She detailed EPA Region 7's process for working with the states to possibly count watershed-based plans submitted as 5-alt documents as "plans in place" toward the WQ-27 measure. Ms. Adkins added that EPA Region 7 looks for all of the Integrated Reporting Memorandum considerations, or a rationale for why a consideration is not needed, in addition to the nine elements of a watershed-based plan, when the plan is submitted as an "alternative." She emphasized that this approach may not work for other regions.

Ms. Johnson then detailed the contents of the Subcategory 5-alt information package that she provides to project partners: (1) a letter explaining contents of the package, what Subcategory 5-alt is, and that TMDLs are still relevant and important; (2) a notes file with data sources and overall results; (3) an *E. coli* file with data analysis, load reduction percentages, load duration curves, and NPDES facilities; (4) an allocations file with charts and graphs of results broken into load capacity, margin of safety, wasteload allocation, and load allocation; and (5) a components file with insertable language, including appropriate element locations and references. Ms. Johnson noted that the components file took the most time, that it goes above and beyond the nine elements, and that charts and graphs are included in an appendix.

Ms. Adkins reiterated that they review all eight considerations in the Integrated Reporting Memorandum, as well as the nine elements, but each document submitted for consideration under Subcategory 5-alt needs to be evaluated independently, with flexibility as to what constitutes each consideration and element. She added that some considerations may not be as robust or even needed, depending on the circumstances. Ms. Adkins said that the EPA Region 7 nonpoint source group did a crosswalk between CWA 319 recommended elements and the "alternatives" considerations, concluding that all nine watershed-based plan elements are represented within the "alternatives" considerations, although the CWA 319 review may have more emphasis on some elements, such as monitoring and stakeholder involvement, and less emphasis on other elements, such as point sources and water quality standards data. She noted that both programs at EPA Region 7 feel that the combined document could be an improved product as compared to either a TMDL or watershed-based plan alone.

Ms. Johnson emphasized the value that she has seen from an "alternative" over a TMDL in these instances, particularly with regard to transparency and stakeholder engagement. She provided her experience in the South Loup Watershed as an example. She added that more potential partners have approached her wanting to do an "alternative" as well. Ms. Johnson clarified that the approach will not work every time, for every pollutant, for every partner, but it can be a good approach in the right situations.

(5) Adam Schempp, ELI: Results of ELI Research into the Many Approaches to Addressing Water Quality Problems

To start, Mr. Schempp provided a quick overview of the changes recently made to ELI's web portal dedicated to the CWA 303(d) program, including a list of hyperlinks to state and

territorial CWA 303(d) program websites and a list of hyperlinks to state and territorial CWA 303(d) Vision prioritization framework documents.

Mr. Schempp then spent the remaining minutes of the session explaining and demonstrating another resource on the web portal, *The Compendium of Water Quality Restoration Approaches*, which organizes examples of successful water quality restoration efforts. He noted that the document is the product of a cooperative agreement with EPA, and that it has been designed in collaboration with a planning group of state, EPA regional, and EPA Headquarters staff. Mr. Schempp said that the examples of restoration efforts chosen for this document have resulted in meeting water quality standards or significantly improving water quality. In either case, a TMDL was not involved in, and did not influence the success of the restoration effort. He added that the examples and categories of approaches in the compendium are not exhaustive. He invited participants to submit additional examples from their respective jurisdictions using the form online or in their binders. Mr. Schempp then led participants through the compendium, from the matrix of pollution (on the Y-axis) and restoration methods (on the X-axis) to the “Key Chart” that provides more information and a hyperlink for the specific projects identified in the matrix. He concluded by noting that, while the examples can provide insight for restoring water quality in advance of developing a TMDL, they also may be useful as methods of implementing a TMDL.

Key Points Raised:

- There are no requirements regarding specific elements to be included in the description of an alternative restoration plan.
- The 2016 Integrated Reporting Memorandum provides criteria to consider when demonstrating that the “alternative” is designed to meet water quality standards, but not all of the criteria need to be addressed in each alternative restoration plan.
- The development of TMDLs is still a statutory obligation, and “alternatives” are not undertaken in lieu of TMDLs. However, if water quality standards are subsequently met, a TMDL would no longer be required.
- An “alternative” should indicate the timeline for restoration, and the state or territory should periodically evaluate if there is sufficient progress in water quality or in implementation towards meeting water quality standards.
- The purpose and process for reviewing watershed-based plans under the CWA 319 program is different than those under the CWA 303(d) program.
- EPA’s review of watershed-based plans will differ for CWA 319 and CWA 303(d) program purposes, but communication and collaboration in this review is important, and some regions have developed a process for it.
- There is extensive overlap between the nine elements of a watershed-based plan and the considerations in the Integrated Reporting Memorandum to help describe “alternatives” for the purpose of the CWA 303(d) program measure. However, watershed-based plan review for purposes of the CWA 319 program may have more emphasis on some elements, such as monitoring and stakeholder involvement, and may have less emphasis on others, such as those pertaining to point sources and water quality standards data.

Session 8: Alternatives Breakout Assignment

This breakout session consisted of six breakout groups, each with a mix of state, tribal, territorial, and EPA regional participants as well as one EPA Headquarters staff member. The intended outcome of the eighth session was:

- Participants will gain experience in working collaboratively to develop alternative restoration plans that are more likely to meet water quality standards and be counted under the measure.

This session was designed to advance the collaborative process, between states/tribes/territories and EPA regions, for developing alternative restoration plans, while increasing the familiarity of all participants with the concept of “alternatives” consistent with the Vision and the process, opportunities, and challenges associated with developing those approaches. States, territories, and tribes have been addressing water quality impairments through methods other than a TMDL for years and in many different ways. The opportunity to do that has not changed, but what has changed is the opportunity to have such efforts that are expected to achieve water quality standards included along with TMDL development in the program measures. While TMDLs remain the dominant program tool, and a program requirement, the focus of this session was on developing “alternatives” for consideration in the measures.

Prior to the training workshop, ELI, with the help of the Workshop Planning Group, crafted seven hypothetical scenarios for which one might pursue an alternative approach to water quality restoration. ELI then distributed these hypotheticals to the registered participants and asked them to select the two that they most would like to discuss at the training workshop. From this information, ELI created six breakout groups, each assigned to a different hypothetical scenario.

Since the purpose of this session was to improve familiarity with the collaborative process for developing an “alternative,” each breakout group was tasked with discussing its hypothetical scenario and developing a rough outline of an alternative restoration plan for it, even if the participants would not individually have pursued an “alternative” in that case. The considerations listed in the 2016 Integrated Reporting Memorandum served as structural aids for the plan outline. Two session leaders, one from a state and one from an EPA region, introduced the hypothetical and facilitated the discussion.

Session 9: Conclusions from the Breakout Assignment

This session featured six brief report-outs, one from each of the alternatives breakout groups, along with a brief facilitated discussion. The intended outcome of the ninth session was:

- Participants will learn how others approached the problems presented and the pros and cons of those various approaches.

(1) Crystal Creek

Hypothetical Scenario: *Crystal Creek is the sole source of drinking water for the City of Springfield and is a popular recreational resource. Cattle production is the primary agricultural activity in the area, with over 80 percent of the 4,100-acre watershed being*

range or pastureland. Poor management of grazing lands and unfettered livestock access to the creek on 18 different ranches have contributed to animal waste entering the creek. Several of the ranches have absentee owners and are managed by a tenant. Concurrently, the City of Springfield has been plagued by an increasing number of disinfection byproducts in its drinking water. Water quality data collected between 1999 and 2007 showed that the geometric mean for E. coli bacteria concentrations within Crystal Creek was 314 CFU/100 ml, well above the state's water quality standard. Crystal Creek was added to the state's CWA 303(d) list in 2008 for E. coli.

The reporters for this group noted that there was consensus among the group that it is reasonable to pursue an alternative approach in this case since the pollutant levels are not extremely high, the watershed is relatively small, there are few stakeholders, there are adversely affected (thus interested) stakeholders, and the problem is not complex. They said that the group decided that installing best management practices (BMPs), such as cattle-exclusion fencing, alternative water sources, and stream crossings, could address the problem, but that the strategy would require buy-in from agriculture associations, commodity groups, and/or individual landowners. Thus, outreach and education likely would be the first step, and key to that effort would be identifying a leader for it. In addition, the breakout reporters noted that project funding would need to be identified, baseline data established, and the sources of the impairment proven to be the sole sources. For funding, the group discussed CWA 319 money (if there was an applicable watershed-based plan), other federal funds, and targeted funding (if a local or regional initiative, such as the Mississippi River Initiative, was in place).

The reporters explained that the group decided to prioritize outreach and implementation among the biggest sources first, rather than trying to address all of the sources at once. As for a timeframe, the group agreed on a shorter timeframe because the problem is one that could be fixed with a few BMPs. The group felt that a maximum of ten years was sufficient to give the local folks a chance to address the impairment with easy implementation. The reporters said that the group would schedule the water to be reassessed after five or ten years, and if the problem was not addressed, a TMDL would be developed for it.

(2) Porterfield Lake

Hypothetical Scenario: *Porterfield Lake is a popular fishing destination and the primary source of drinking water for several nearby towns. The lake's watershed drains approximately 3,500 acres of predominantly cropland. Half of the cropland in the watershed is on tribal land, and one arm of the lake extends onto the reservation, where the tribal nation conducts subsistence fishing and ceremonial events. One of the towns that relies on Porterfield Lake for its water supply treats water and has a contract to supply drinking water to the Reservation. Herbicide application on row crops in the watershed typically follows the recommendations of the label, but combined with subsequent storm runoff, has caused an excess of atrazine in the lake, exceeding the state's domestic water supply criterion and chronic aquatic life support criterion. As a result, Porterfield Lake was added to the state's CWA 303(d) list in 2006 for atrazine.*

The reporter for this group explained that, since the lake is a source of drinking water, the group of participants agreed that the problem needs to be addressed quickly, making an “alternative” reasonable. Still, several people in the group said that they likely would develop a TMDL first. The group decided that a watershed-based plan would be a good approach because of the resources and CWA 319 money that would be needed. The reporter noted that the group identified state and federal agencies, the municipality, the tribal government, and sport fishing groups as potential partners. The group listed a watershed coordinator, tribal coordinator, NRCS liaison, and drinking water coordinator as important collaborators to ensure that atrazine does not make it to the tap. The group also identified multiple potential funding sources, including NRCS, the CWA 319 program, the tribe (directly and through resources available to it), game and sportsmen groups, and possibly the manufacturer of the chemical.

The reporter said that the group wanted to know who had been monitoring the watershed (whether the state, tribe, USGS, citizen groups, or others), to collect that existing data, and to then try to fill the holes. In particular, the group felt that an effective plan would need to be based on precise information about where the atrazine is entering the lake and its tributaries, and what portion of the problem stems from what sources. Going forward, the group felt that it would be critical to do monthly monitoring to see if the plan is working.

With regard to a timeline for achieving water quality standards, the reporter noted that there was disagreement among the group. One person thought that water quality standards might be achievable in a year, but much of the group thought that it might take a year just to get stakeholder buy-in, particularly given the stakeholders involved. The more conservative estimate for meeting water quality standards was three to five years. The group preferred to focus on progress and whether the plan is leading to actions to improve water quality, not just on the final goal.

The reporter concluded by explaining that the group made many assumptions, largely due to the lack of information, and that this proved to be the most significant difficulty and the largest risk in the plan. She added that, if the tribe and farmers are not interested in collaborating, the plan will not go far.

(3) Babbling Brook

Hypothetical Scenario: Babbling Brook is fed by a 2,100-acre watershed that has a mix of urban and agricultural land uses. With the suburban growth of nearby Central City, significant portions of the watershed are being rapidly developed and have MS4 systems. No wastewater treatment plants discharge into Babbling Brook. There has been increases in volume and intensity of stormwater runoff, eroding the banks of Babbling Brook and scouring the stream riffles. In addition, baseflows in the stream have diminished in recent years. A 2012 fish assessment produced an Index of Biotic Integrity (IBI) score of 11. Waterbodies in this ecoregion of the state are considered not supporting the fish and wildlife propagation designated use if an IBI score is less than 19. As a result, Babbling Brook was added to the state’s CWA 303(d) list in 2014 for loss of biological integrity.

The reporter for this group relayed the group's sentiment that an important early step in the "alternative" would be to get partners in the watershed together to discuss the problems, and to offer incentives for their involvement. The group also suggested the use of TMDL-Lite to demonstrate the loading contributions of agriculture versus urban areas and to help get buy-in to the "alternative." The potential specific actions in the approach included cattle-exclusion fencing, riparian area restoration, stormwater capture, and redevelopment and retrofits. The group highlighted the value of developing a watershed-based plan, to help address impacts from agriculture and to open the opportunity for CWA 319 funding.

The reporter then explained the group's view on partners and resources, that regional planning commissions, the state permitting program, agricultural agencies, and conservation districts could be instrumental in facilitating outreach and coordination among the relevant stakeholders. The group suggested funding sources ranging from local governments, to the CWA 319 program, to CWA 106 grants, to foundations, to universities, and even to the state legislature. The group actively discussed the potential role of stormwater fees as a means of funding MS4 implementation and agricultural improvements.

Regarding monitoring, the reporter said that the group discussed the parameters for which improvement might be measured, whether flow, flow surrogates, or sediment. They also expressed a preference to utilize volunteer monitoring to the extent possible, including loaning watershed groups equipment and providing them laboratory capacity. Regarding timing, there was consensus that the timeframe may not be long because this is a small watershed, but the MS4 issues could take 20 years to resolve. The group stressed the value of interim goals and milestones, as well as water quality monitoring requirements, to show that the water quality is improving along that timeframe. They also suggested using the Integrated Report to update the public on the progress being made on the ground, even if the water is still impaired.

Among the challenges faced by the group were what would be an acceptable timeframe for achieving water quality standards and how to mitigate finger-pointing, but the group felt that an "alternative" could be beneficial in this case, particularly in light of challenges with flow TMDLs.

(4) Silver Lake

Hypothetical Scenario: Silver Lake is located in the Jamestown Metro Area and is regularly used for recreational activities such as sailing, fishing and swimming. The lake drains an area of more than 15 square miles, which was historically dominated by timber and grass. Extensive commercial and residential development has occurred over the past decade in the upper watershed and the corresponding stormwater runoff has degraded the water quality of the lake, with increased algal blooms and diminished clarity. Data from 2003 to 2009 revealed upward trends in the lake's nutrients and chlorophyll-a, while Secchi disc transparency has decreased by 50%. As a result, Silver Lake was added to the state's CWA 303(d) list in 2010 for eutrophication. The state's criteria for nutrients and turbidity are narrative.

The reporter began by identifying assumptions made by the group: (1) there is an active watershed group with interest in the lake and its quality, because this is a recreational lake; and (2) funding is available for at least some of the work contemplated by the group. The first step in the group's "alternative" would be to compile water quality monitoring data and information regarding land use changes. That information could help identify sources, make assumptions about the causes of load changes, and project potential load reductions. The second step would be to provide that comprehensive picture to stakeholders, so as to engage them early in the process.

The reporter noted that the group anticipated participation by the municipality (ideally as the force to call the other stakeholders together) and potentially by recreational groups, boat owners, homeowners, the Department of Transportation, the stormwater district, the chamber of commerce, realtors, and environmental groups. The group believed that the state could provide some level of funding, technical support, and outreach and education, and that the local government might be able to provide financial support as well as leadership. The group of participants supported the creation of a stormwater utility district, particularly for the purpose of permitting as well as levying stormwater fees for stormwater management and riparian restoration efforts.

The reporter noted that the group expressed the preference of keeping the lake in the monitoring plan for the state, but to supplement that data with citizen monitoring, to the extent feasible. As for timing, the group believed that it might be able to achieve water quality standards within 15 years if the plan was implemented as envisioned. There was consensus among the group that progress reviews should occur at two- or five-year intervals. If progress was not being made, a TMDL would be developed.

(5) Serenity Lake

Hypothetical Scenario: Serenity Lake covers 2,000 acres and is valued for boating, fishing and swimming. Most of its watershed is managed by the Bureau of Land Management and leased for livestock grazing purposes. Residential development is concentrated along the shoreline. In recent years, Serenity Lake has been plagued by an over-abundance of noxious blue-green algae, resulting from a combination of failing septic systems on lakefront properties and livestock access to riparian areas of tributaries flowing into the lake. Serenity Lake was added to the state's CWA 303(d) list in 2010 for eutrophication, failing to meet the state narrative criteria for nutrient impacts on recreation uses.

The reporter explained that the group members decided to make their plan basic and divided it into two phases. Phase I concerned low-hanging fruit, starting with public outreach and education. She added that people often do not realize that their septic systems might be contributing to water quality problems. In addition, phase I involved addressing information gaps and working with the Bureau of Land Management, as the primary landowner, to change and better enforce grazing plans as well as to establish cattle exclusions and alternate water sources. The group also discussed the involvement of NRCS and university extension offices as possible collaborators and sources of funding. The group desired ongoing source tracking, via qPCR, to try to determine the extent to which cattle and septic systems are contributing to the impairment. Phase II would consist of more complex and/or expensive

management. For example, septic systems could be repaired or sewer systems could be installed. Yet, the expense of these solutions could pose a significant barrier. Support by an entity like New Mexico's Construction Bureau, which helps municipalities put in infrastructure, could be critical.

The reporter said that the group expected water quality standards to be achieved, particularly since only two categories of sources are causing the impairment. While the group hoped to see a trend toward recovery soon, it did not anticipate achieving water quality standards in fewer than ten years.

As with other groups, this one was challenged by the lack of information. The group noted that having an entity in charge of the lake, such as the Army Corps of Engineers or an irrigation district, could make management easier and provide assistance with monitoring. The geographic location of the lake also would matter, particularly as that would affect the water rights structure and rules thereof. Furthermore, the density of residences along the shoreline and when they were built, as compared to when the cattle grazing started, makes a difference.

(6) Crooked Creek

Hypothetical Scenario: The watershed of Crooked Creek is heavily forested and has little industry, agriculture or other development, but strip mining during the mid-1900s left two abandoned coal mines. Water flowing from these mines has contributed acidic water, metals and sediment to Crooked Creek, preventing the creek from attaining its aquatic life use. Monitoring data from 2007 indicated an average pH for the creek of 4.2, an average aluminum level of 5.34 mg/L and an average copper level of 6.47 mg/L, all significantly outside the state criteria. The creek also lacked pollution-intolerant macroinvertebrates common in reference streams. As a result, Crooked Creek was added to the state's CWA 303(d) list in 2008 for pH and metals.

The reporter began by noting that these mining issues typically require significant pollutant reductions, are complex and expensive, and often are not addressed with the first restoration effort. As a result, he explained, an "alternative" can be beneficial in such scenarios because the development of a "living" plan can identify stakeholders and inform them of how they can help do and fund the work needed.

The reporter identified several assumptions made by the group: (1) this is a stormwater issue; (2) there are only two mines; (3) it is a highly recreated creek, and thus there is public interest in it; and (4) the water quality in the listing is accurate, currently and historically. He added that even if the data is accurate, more baseline monitoring is necessary, particularly to know which one of the piles is contributing to the impairments the most.

The group decided on a variety of activities, including remediating the piles, re-establishing the riparian zone, and helping develop exfiltration. Partners might include a watershed or recreation group (e.g., Friends of Crooked Creek); an abandoned mines land program, if existing in that state; or another federal or state program that addresses these problems.

Superfund also may provide financial support, as could a downstream mine that wants a permit to come online.

The reporter explained that the group felt that the planning process should be state-led, that the state would write the plan with stakeholder input. He also said that the objective of this approach is to meet water quality standards sooner rather than later, and the effectiveness monitoring done after implementation will determine whether additional actions are needed.

Session 9 Plenary Discussion:

The open discussion portion of the session began with one of the state participants asking how many states are listing waters under Category 5-alt in their 2016 Integrated Reports. Participants from seven states raised their hands. One of those participants added that her state's report was approved three weeks earlier with Category 5-alt in it.

A state participant asked whether an alternative restoration plan must be recognized in the measures for the impairment to be included in Category 5-alt, to which an EPA Headquarters participant responded that EPA does not approve the 5-alt category in the list, only that the impairment is appropriately in Category 5. He continued by saying that the state would be noting its pursuit of an "alternative" by listing the impairment in Category 5-alt, and, for purposes of measures reporting, the state and EPA region would need to discuss it. He concluded by adding that, ideally, there will be discussions all along the process of developing the "alternative," and there will be harmony between what is in Category 5-alt and what is reported under the measures. A participant from EPA Region 4 expressed her agreement and noted that the region included a description of a Category 5R document in its decision document issued for a recent CWA 303(d) list, recognizing (but not approving) that a plan was in place.

A state participant sought clarification on EPA's earlier statement regarding evaluation of whether to continue to include "alternatives" under the measure as of 2022, to which an EPA Headquarters participant explained that, in 2022, EPA will check whether progress has been made for waters included under WQ-27 as being addressed by an "alternative." If implementation is not happening, then the plan may no longer count as part of WQ-27. She added that this is a review of specific listings, not an overall change in the Vision. Another EPA Headquarters participant clarified, after an inquiry from a state participant, that progress need not necessarily be in the quality of the water; it could be progress in assembling partners, procuring funding, and meeting other milestones, when the timeline for restoration is longer. He added that the answer really depends on the plan and its intended duration.

Key Points Raised:

- Since buy-in from stakeholders and potential partners often is critical to developing and successfully implementing a restoration plan, outreach and education commonly are important early tasks.
- Financial support could come from various sources, whether those that are common, e.g., the CWA 319 program, to those that are not, e.g., the chemical manufacturer.
- A plan is more likely to succeed when there is strong (local) leadership.
- For effectiveness monitoring to be meaningful, good baseline data should be established.

- Identifying all sources of the impairment and their approximate contributions to the problem can improve the collaboration with pollution contributors and ultimately their buy-in to the plan. New York’s “TMDL-Lite” can serve this purpose, covering the major aspects of a TMDL analysis but taking a fraction of the time to develop.
- Particularly for alternative restoration plans that anticipate a longer timeline for achieving water quality standards, interim milestones are useful for determining whether the plan is on track to meet water quality standards or whether the water should be reprioritized for TMDL development.
- Progress eventually needs to be demonstrated in the quality of the water, but in the near-term, initial progress could center on assembling partners, procuring funding, and meeting other milestones, especially for complex and lengthy restoration efforts.

Session 10: Breakouts by Region

This breakout session consisted of nine breakout groups, one for each EPA region, with EPA Region 1 and Region 2 being combined. The breakout groups contained state, tribal, territorial, and EPA participants from that region as well as the regional liaison from EPA Headquarters. Intended outcomes of the tenth session included:

- Participants will better understand the needs, challenges, and views of others in their respective regions.
- Participants will have resolved, or at least advanced conversation on, issues important to the states, tribes, and territories of the region.

This session provided participants an opportunity to learn about and discuss issues important to the states, tribes, and territories of the region and to help all participants better understand the needs, challenges, and views of others in their region. Prior to the training workshop, ELI collected discussion topic preferences from each of the state, tribal, and territorial participants, as part of the registration process. ELI created nine distinct lists of identified topics, one for each breakout group based on the preferences of the participants from that region, and distributed them to the respective breakout groups to help structure the discussion.

Session 11(a): Integration with Other Programs – MS4 Permitting

This session consisted of two presentations, followed by a plenary discussion. Intended outcomes of Session 11(a) included:

- Participants will learn what progress has been made at the national level regarding integration with OST, OWM, Superfund, OGWDW, and other federal agencies.
- Participants will learn methods for integrating TMDLs and MS4 Permits.

(1) Ruth Chemerys, EPA HQ: CWA 303(d) Program Integration: National-Level Activities

Ms. Chemerys explained that her presentation would cover the overlap between the CWA 303(d) program and other programs, specifically developments at the national level. She started with integration efforts with other Clean Water Act programs. Ms. Chemerys

reiterated comments from the prior morning regarding work with the CWA 319 program on watershed-based plans as potential alternative restoration plans. With regard to the permits program, she emphasized the ongoing EPA TMDL-permits workgroup and coordination on the permit implications of TMDL revisions. She also tied up the subsequent presentation by briefly referencing the tools and guidance issued concerning municipal separate storm sewer systems (MS4s) and TMDLs.

Ms. Chemerys elaborated on integration efforts with the water quality standards program, specifically the policy concerning and implementation of complex CWA 304(a) criteria, such as selenium; downstream protection guidance and tools; regulatory revisions of water quality standards and subsequent products; and the Water Quality Standards Academy. Ms. Chemerys also explained developments concerning tribes, most notably the proposed rule to treat tribes in the same manner as states for purposes of the CWA 303(d) program and the re-interpretation of CWA 518(e), allowing tribes to implement the congressional delegation of authority in the Clean Water Act.

Ms. Chemerys then shifted her focus to integration with other programs, in and outside EPA. She noted the 2015 memorandum between the Office of Enforcement and Compliance Assurance, Office of Solid Waste and Emergency Response, and Office of Water on contaminated sediments, and the related workgroup. On the issue of climate, Ms. Chemerys referenced the work being done by the Office of Research and Development to evaluate BMPs for climate resiliency, as well as initial discussions regarding the consideration of climate change in the TMDL process. With regard to monitoring and data sharing, she emphasized the continued implementation of the Water Quality Framework. She also highlighted the Recovery Potential Screening tool, the WATERSCAPE tool, a tool concerning vulnerability to sediment erosion due to forest fires, Preliminary Healthy Watersheds Assessments, and the integration of particular datasets. In addition, Ms. Chemerys mentioned that the USGS will be launching a climate change hydrology web portal in the summer of 2016.

(2) Jamie Fowler, EPA HQ, and Greg Schaner, EPA HQ: Update on EPA Efforts to Support Translating TMDLs to Stormwater Permits

Mr. Schaner began the presentation by explaining the challenges to integrating MS4s and TMDLs. He noted that MS4s are treated differently from all other point sources under the Clean Water Act because they are subject to what is referred to as the “MEP” standard, requiring permit controls to “reduce the discharge of pollutants to the maximum extent practicable.” He added that, despite this standard, the permitting program still must establish MS4 permit requirements consistent with the assumptions and requirements of applicable TMDL wasteload allocations. Mr. Schaner explained that, in addition to these statutory hurdles, there also are practical challenges: the sources of pollutant impairments often are diffuse and spread over large areas, with many outfalls; treatment facilities cannot be added to the end of these vast networks of pipelines; impairments are not just pollutant-based, but also due to the volume of stormwater; it is difficult to determine the level of control needed to address a specific use impairment; stormwater BMPs have been challenging to design for specific pollutant concentrations, and their effects have been hard to verify; and there is not

much large-scale monitoring occurring, combined with the difficulty of using monitoring to characterize MS4 loadings.

Mr. Schaner then detailed the efforts by EPA to address these challenges and better integrate the permitting and CWA 303(d) programs for purposes of MS4s and TMDLs. He started with the 2014 stormwater-TMDL memorandum, which provided revisions to the November 22, 2002 memorandum “Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Stormwater Sources and NPDES Permit Requirements Based on Those WLAs.” Mr. Schaner said that the memorandum noted that where a TMDL includes wasteload allocations for stormwater sources, the permit should include effective, measurable water quality-based effluent limitations to achieve the wasteload allocation, potentially in the form of numeric effluent limitations or limits via BMPs with clear, specific, and measurable elements. He added that whether to rely on limits via BMPs will depend on the way in which the wasteload allocation is expressed; the nature of the stormwater discharge; and available data, modeling results, and other relevant information.

Ms. Fowler then took to the podium to explain more of the TMDL side of the equation. She said that the 2014 memorandum acknowledges that allocations of pollutant loads within a TMDL still are driven by the quantity and quality of existing and readily available water quality data, adding that the memorandum encourages TMDL and permit writers to coordinate efforts to identify stormwater contributions from specific sources during TMDL development. As for the actual language in a TMDL, Ms. Fowler explained that residually designated sources of stormwater should be characterized in a load allocation, contingent on the source remaining unpermitted, but that this allocation would become a wasteload allocation if the stormwater discharge later was required to obtain NPDES permit coverage.

Ms. Fowler then described the TMDL to Permit Integration Workgroup, which was first convened in January of 2013. Workgroup participants include EPA Headquarters and EPA regional TMDL and NPDES staff, as well as staff of the Office of General Counsel. Ms. Fowler explained the objectives of the workgroup to be finding water quality protective solutions for addressing TMDL implementation challenges in permits and ensuring the future development of “permit-friendly” TMDLs through improved collaborations among programs. She noted that the workgroup has a monthly forum to discuss and share solutions, has a website with recommendations on how to address common challenges associated with implementing wasteload allocations in permits and how to access TMDL and permit data in EPA databases, hosted a training workshop for states and EPA regions at the July 2013 Permit Writers Conference, and prompted the EPA Region 9 “Helpful Practices” document for developing permit-friendly TMDLs and effectively incorporating wasteload allocations into permits.

Ms. Fowler noted other technical assistance resources, starting with the 2008 Draft TMDL to Stormwater Permits Handbook, which was developed to foster a better understanding of cross-program regulatory requirements and programmatic processes for TMDL and permit writers as well as offer technical options for developing stormwater TMDLs and linking stormwater permits with those TMDLs. She said that the handbook suggests specifically detailing in a permit what MS4s need to be doing every five years, marrying the wasteload

allocation with BMPs, and relating the endpoint of the permit with the wasteload allocation. She also described the three TMDL permit writer training modules: (1) Understanding TMDLs: A Primer for NPDES Permit Writers; (2) Understanding WLAs in Permits: A Primer for TMDL Developers; and (3) Understanding TMDLs with Stormwater Sources and the NPDES Stormwater Permitting Process. In addition, Ms. Fowler mentioned the NEIWPC webinars, the first of which focused on modeling applications for integrating TMDLs into MS4 permits, and the OPTI-Tool, a spreadsheet-based BMP optimization tool developed for EPA Region 1.

Mr. Schaner introduced EPA's 2014 document entitled "Post-Construction Performance Standards & Water Quality-Based Requirements: A Compendium of Permitting Approaches." It contains examples of numeric and non-numeric expressions of the water quality-based effluent limitations, permitting authority review and approval of TMDL plans, outfall monitoring, annual reports, and other approaches. Mr. Schaner then provided an example from the compendium from the State of Washington. He concluded the presentation with brief commentary on the MS4 remand rule, which he said echoes the 2014 stormwater-TMDL memorandum, calling for MS4 permits to establish "clear, specific, and measurable" effluent limits, including requirements addressing approved TMDLs. He added that the rule is to be finalized no later than November of 2016.

Session 11(a) Plenary Discussion:

The facilitated discussion began with questions from training workshop participants about the presentations. A state participant noted that the 1999 Federal Register included information about monitoring for small MS4s; he asked what the plans are for that going forward. Mr. Schaner responded, saying that he does not have the greatest handle on monitoring for small MS4 programs, but that more programs are moving in that direction. He questioned whether it is possible to have a sufficient monitoring program to measure varying levels of output and reliably convey the effects of BMPs. Mr. Schaner added that some states are choosing to do up-front work on BMPs rather than pinning their resources on monitoring, building in how those practices are going to perform. He concluded by saying that they are seeing a variety of approaches, so it is not a negative thing that monitoring has not advanced more. A state participant concurred with this assessment, adding that they have hundreds of MS4s in his state and that they wrap implementation into the permit. Mr. Schaner noted that they looked at the state's approach for the compendium and always liked it, particularly since the state includes the public in the permitting process.

A state participant asked whether there is coordination with the Department of Transportation on stormwater issues. An EPA Headquarters participant responded by saying that they have been working with the Federal Highway Administration on highways and stormwater, including on a resource akin to the compendium referenced earlier in the session. Another state participant noted that they worked with the Department of Transportation to incorporate over 100 TMDLs into Department of Transportation plans, by identifying BMPs for categories of pollutants and requiring the Department of Transportation to prioritize what they will implement each year.

Another state participant and an EPA regional participant asked how effective residual designation might be as a tool for addressing stormwater, to which Mr. Schaner explained that residual designation is a concept built into their regulations that allows them to pull in additional sources of stormwater to be regulated as a point source, if so petitioned. He said that he cannot speak to how the residual designations are going, since almost all of them are based on litigation. He added that many of the designated sources are going to be in MS4s, raising the question of how to deal with them in a wasteload allocation. The same EPA regional participant noted that many of these designated sources are universities and hospitals, and she asked whether the hook of residual designation could be helpful or not. Mr. Schaner said that, where they are given evidence, they regulate some universities and military bases, but from a resource standpoint, it is a question of whether they can pull them under the permit program, adding that the tension is mostly with the resource and whether the state or EPA can provide sufficient oversight. Another state participant suggested that just the possibility of a permit can be incentive to implement BMPs.

A state participant asked whether an objective of EPA's efforts is to have TMDLs that set hard targets for MS4s, to which Mr. Schaner concurred. Mr. Schaner acknowledged the difficulty in specifying in the TMDLs what each MS4 should do, but doing that makes things easier for the MS4s. He quickly added that doing so does not mean that attainment will occur in five years, but including milestones is a good approach. He stressed the value of flexibility with regard to timing. Another state participant asked about how a city's integration of all wet weather discharges might affect permitting. Mr. Schaner said that such integration is an approach that they are encouraging, and while they have not done a permit that combines everything together, they think that it is feasible.

A third state participant asked whether there have been effective ways of addressing construction in stormwater general permits, to which Mr. Schaner said no and asked the same of the participant. She noted that her state has been trying to do so, and that they have been able to establish a link to their construction general permit, but that it is more challenging for MS4 permits. Mr. Schaner indicated that they have requirements in their construction permits that try to focus on additional requirements for Tier 2 and 3 waters, but that he does not know how effective they are. That same state participant then asked about the possibility of using a general permit as an "alternative." An EPA Headquarters participant reiterated the importance of starting the conversation early with regional counterparts and then said that the answer likely depends on how robust the stormwater program is. He added that the key is how to show that standards will be achieved.

Adam Schempp of ELI turned the focus of the session to the first discussion question: "How have you been linking your TMDLs and stormwater permits?" A state participant answered, noting that they incorporated TMDLs into MS4 permits, but then multiple MS4s sued them. She explained that the state won the lawsuit, and now they are issuing the new permits, which require the new permittees to submit a TMDL implementation plan prioritizing BMPs for addressing the applicable pollutants. She added that the permittee must show progress during the permit term, which they can choose to do in any way. Many are choosing to do monitoring, though they can choose to do modeling.

An EPA regional participant explained that one of the states in her region is trying to do something similar because of a lawsuit. She noted that, even though applicants already had developed TMDL plans as per their old permits, they are having to go back and public notice all of those TMDL plans before they can apply for the new permit because all public participation that must occur in the course of developing a TMDL must occur before an application is submitted. Mr. Schaner asked how long the participant thinks that process is likely to take, to which she responded that it is taking a long time. She added that it is not an ideal process, and she would not use a general permit for this purpose. The state participant who provided the prior answer noted that they are only issuing individual permits.

Mr. Schempp then posed the second of the discussion questions: “What tools, procedures, agency structures, or other means of facilitating coordination have you found useful when it comes to MS4 permitting and TMDL development?” A state participant explained that they work very closely with the stormwater permitting program, noting that the latter starts drafting the permit and the former fills in the water quality requirements. Regarding the MS4s themselves, she said that her program has done extensive outreach, including webpages showing the relationship between MS4s and impairments, and has required MS4s to do additional BMPs in some cases. Another state participant added that they are coordinating with their permitting program, notably writing their MS4 permit to read: “...in coordination with our TMDL implementation plan...”

Key Points Raised:

- The CWA 303(d) program is working with the water quality standards program at the national level on complex CWA 304(a) criteria, downstream protection guidance and tools, regulatory revisions concerning water quality standards and subsequent products, and the Water Quality Standards Academy.
- The Office of Water at EPA is working with the Office of Enforcement and Compliance Assurance and the Office of Solid Waste and Emergency Response on contaminated sediments.
- There are multiple statutory and practical challenges to integrating MS4s and TMDLs.
- The 2014 stormwater-TMDL memorandum encourages TMDL and permit writers to coordinate efforts to identify stormwater contributions from specific sources during TMDL development.
- The 2014 stormwater-TMDL memorandum also suggests that a MS4 permit should include effective, measurable water quality-based effluent limitations to achieve an applicable wasteload allocation.
- The 2008 Draft TMDL to Stormwater Permits Handbook suggests including in a permit what MS4s need to do every five years, marrying the wasteload allocation with BMPs, and relating the permit endpoint with the wasteload allocation.
- The TMDL to Permit Integration Workgroup, comprised of EPA Headquarters and regional TMDL and NPDES staff, and staff of the Office of General Counsel, has a website with recommendations on how to address common challenges associated with implementing wasteload allocations in permits and accessing TMDL and permit data.
- Some states are choosing to do up-front work on BMPs rather than relying as heavily on monitoring, building in how those practices are going to perform.

- A state is issuing new MS4 permits that require applicants to submit a TMDL implementation plan that prioritizes BMPs for addressing the applicable pollutants, and the permittee must show progress during the permit term.
- Methods of integration have been as simple as the MS4 permit explicitly referencing coordination with a TMDL implementation plan or the CWA 303(d) program noting water quality requirements in the MS4 permit.
- Just the possibility of a MS4 permit can be incentive to implement BMPs.

Session 11(b): Integration with Other Programs – Cleanup Efforts

This session featured one presentation, followed by a plenary discussion. The intended outcome of Session 11(b) was:

- Participants will learn methods for collaborating with cleanup program staff regarding restoration efforts and meeting water quality standards.

Jason Sutter, AZ: “WQS... we’re supposed to meet standards?”

Mr. Sutter began the session with an overview, and examples from his state, of the challenges to and benefits of coordination with regard to waste cleanups. He specifically focused on abandoned mines. He noted that many state and federal agencies are tasked with mitigating abandoned mine risk, and each agency and program has its own set of priorities, goals, and limitations. As an example, Mr. Sutter said that the U.S. Forest Service often focuses primarily on recreational uses when addressing abandoned mines in Arizona. He identified two major questions that his program has been facing: (1) how the attainment of water quality standards can be included as a goal regardless of who oversees the cleanup effort; and (2) what can be done when water quality standards are not met after remediation.

Mr. Sutter then provided brief background information regarding Arizona. He noted that federal lands compose 43 percent of the state, and tribal lands account for 28 percent of the state. He said that only 16 percent of the state is privately held, and 13 percent of the state is owned by the state. Mr. Sutter displayed a map depicting the location of roughly 10,000 mines in Arizona, and he added that the Arizona Mine Inspector estimates that there may be as many as 80,000 abandoned mines across the state. He noted that the Clean Water Act has had a significant impact but that there still is much work to do, showing pictures of highly discolored streams in Arizona. He added that many of these water quality impairments occur in parts of the state where people rarely are.

Mr. Sutter explained the means of coordination that his program, the Arizona Department of Environmental Quality (ADEQ) Water Quality Division, has established with the U.S. Forest Service. He referenced a memorandum of understanding that was renewed in 2014; an annual meeting of his program with the ADEQ Surface Water Section, regional U.S. Forest Service hydrologists, and personnel from the six forests located in Arizona to cover agency updates and nonpoint source pollution activities; an annual meeting of his program with the On-Scene Coordinator to discuss priorities and coordination as well as to review completed and

proposed actions; and the fact that his program is notified about CERCLA-related U.S. Forest Service actions.

Mr. Sutter said that the primary purpose of U.S. Forest Service removal actions is to protect public health and welfare and the environment. He added that the Service typically uses Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority, in which case the Service need not obtain state or federal permits, but they must comply with state and federal environmental regulations to the extent practicable. Mr. Sutter provided a couple of example objectives: (1) reducing or eliminating the exposure of humans and wildlife to contaminated soil; and (2) reducing or eliminating the movement of tailings, waste rock, and acid mine drainage downstream. He also listed example U.S. Forest Service targets for removal: the Arizona soil remediation level for non-residential uses; and background soil or water concentrations. He added that, in his experience, the U.S. Forest Service rarely has mentioned obtaining water quality standards as an objective.

Mr. Sutter then provided a series of abandoned mine cleanup examples in Arizona. He noted that the McClellan Mine cleanup was a joint EPA and U.S. Forest Service CERCLA action in 2004. The water quality concerns were copper, zinc, and cadmium from mine tailings, waste rock, adit discharge, and natural background sources. Mr. Sutter said that there are summer homes throughout the area, some built on old tailings and mining dumps. He added that the state developed a TMDL for the river to which this creek is a tributary. He explained that, when they sampled in 2005, the problem was getting worse, and they realized that the original remediation had missed acid mine drainage that was being liberated downstream.

Mr. Sutter detailed the circumstances of the World's Fair Mine. He said that the U.S. Forest Service installed a cap in 2006 and a plug in 2011. The water quality concerns were copper, zinc, cadmium, and pH from mine tailings, waste rock, adit discharges, an artesian well, and natural background sources. There were concerns about contamination of a preserve and state park with a lake. Mr. Sutter said that the U.S. Forest Service summary after the cap was installed stated that the remediation was complete, but when the state did subsequent testing, there still was a problem. Compliance staff issued a notice of violation, which led the Service to revisit the adit discharge. He noted that the subsequent actions have more or less worked.

Mr. Sutter then described the Gibson Mine, located east of Phoenix, cleanup. He said that the main water quality concern was copper from mine tailings, waste rock, adit discharges, and natural background sources. He noted that most of the relevant area is on private land, owned by the San Francisco Friars. Mr. Sutter explained that CWA 319 funding was used to remove the worst sources of copper, and the Friars redid the cap in 2013, but issues remain.

Mr. Sutter concluded his presentation with a list of strategies for improving integration on waste cleanups. Most importantly, he noted that effective communication, with stakeholders as well as other agencies and programs, is critical. He added that state staff should emphasize water quality standards attainment when commenting on planned activities. He also suggested requesting that monitoring activities include the collection of water quality data rather than just visual assessments of project stability. Mr. Sutter then detailed the value of

getting a commitment to revisit the project if goals and objectives are not met, before opening the session to questions.

Session 11(b) Plenary Discussion:

An EPA regional participant asked Mr. Sutter how, in his experience, these projects tend to relate to TMDLs. He responded with a few examples. He noted that a TMDL for Turkey Creek helped the U.S. Forest Service prioritize that problem, and in another instance, the TMDL helped prioritize funding for the cleanup effort. He also said that TMDLs indicate that there is a Clean Water Act issue and highlight the need to consider that element of the problem.

A state participant asked whether there are good criteria for focusing on high risk mines, to which Mr. Sutter replied that there are a few good GIS covers and that the U.S. Forest Service has done its own survey, but that it takes some digging to find the information. He added that, if there is a high density of mines in an area with perennial water, they will prioritize it for data collection. Mr. Sutter also said that they have looked at slopes in watersheds to see if there is a connection between streams and mines. He suggested developing a list from assumptions, checking that list through field analysis, and then tweaking the assumptions accordingly.

Adam Schempp of ELI then shifted the focus of the discussion to the questions in the agenda. He first asked which participants have experienced instances where the goals of the lead cleanup agency were met but water quality still was degraded. Nearly half of the state, tribal, and territorial participants raised their hands.

Mr. Schempp then asked: "In what instances have cleanup efforts resulted in water quality standards being attained, and was the CWA 303(d) program involved?" A state participant answered that a few years ago a road was causing contamination; the U.S. Forest Service addressed the issue and considered the emergency over, but the state remained at the table, insisting that the issue was not resolved because water quality standards still were not being met. She added that, after additional work, the waterbody now meets standards. Another state participant explained that a retention pond in his state was contaminated with PCBs. In light of the retention pond owner's wasteload allocation, he could have just slowly discharged the pond water, but the state negotiated a remediation effort via water filtration systems. A third state participant referenced the capping and re-contouring of a mercury mine, which resulted in attaining water quality standards. He also noted an ongoing Superfund site issue, adding that some examples are not success stories. A fourth state participant said that they have been working with their hazardous substances program to control roving PCBs; specifically, the engineers from each program worked together to protect water quality as well as babies.

Seeing the logical point of transition, Mr. Schempp then posed to the participants the third and final question: "What methods of coordination have improved, or could improve, the likelihood of cleanup actions meeting multiple agencies' goals?" A state participant replied that several approaches have worked in her state: their group develops risk-based standards for the remediation program; they have tied groundwater discharging to water quality criteria; they issued guidance on water quality criteria targeting chemicals that they are finding; and they are developing risk assessment guidance that will include water quality. Another state participant

noted that they have developed robust GIS data across relevant departments, and they meet regularly to discuss maps. He added that the physical proximity of the GIS staff has made this level of integration possible; they begin to understand each other's programs and think to include each other as projects develop.

Key Points Raised:

- Multiple state and federal agencies often have a stake in a waste cleanup, and each agency and program usually has its own set of priorities, goals, and limitations.
- Memorandums of understanding, regular meetings, and notifications of activities among agencies can improve integration, but they may not necessarily overcome the challenges of differing objectives.
- Effective communication with stakeholders as well as other agencies and programs is critical to successful integration on waste cleanups.
- Physical proximity and good working relationships between the staffs of different programs can greatly improve the likelihood and effectiveness of integration.
- CWA 303(d) program staff can better their chances of attaining water quality standards from cleanup efforts if they: (1) emphasize the attainment of standards when commenting on planned activities; (2) request that monitoring activities include the collection of water quality data rather than just visual assessments of project stability; and (3) get a commitment to revisit the project if goals and objectives are not met.
- Persistence, innovative thinking, and using the variety of tools and enforcement measures at one's disposal can help incorporate water quality considerations into cleanup activities, when communication is not enough.
- TMDLs can lead another agency to prioritize an associated waste cleanup project, can prioritize funding for that project, or simply can highlight the fact that there is a Clean Water Act issue and encourage consideration of that element of the problem.

Training Workshop Wrap-Up

This final session consisted of two sets of closing remarks.

Adam Schempp of ELI opened the final session with a brief reference to the resources, including the presentations and materials from this training workshop, that are and will be available on ELI's website. He explained that ELI has been building out its web portal dedicated to the CWA 303(d) program to be a more robust information hub for government staff and the public. He noted that the online library, which will be expanded in the coming months, currently includes *The Compendium of Water Quality Restoration Approaches*, a collection of state CWA 303(d) Vision prioritization frameworks, and memorandums of understanding regarding data sharing between states and the Natural Resources Conservation Service. He added that information about this and other training workshops can be found under the "Training Workshops" tab, and there also is a page with links to all state and territorial CWA 303(d) program websites. Mr. Schempp requested that participants send him materials to add to the portal as well as suggestions about how to make the portal more helpful.

Mr. Schempp concluded by expressing his appreciation to all of the participants for their attendance, attention, and contributions in and outside the classroom. He said that he hopes that each person walks away from the training workshop with inspiration, new ideas, and a better sense of the national CWA 303(d) community.

(1) Jim Havard, EPA HQ: Summary and Next Steps

Mr. Havard summarized the lessons from the week, session by session, and identified next steps to take. He applauded the high number of states that had submitted CWA 303(d) Vision priorities, and the many of them that included integration and engagement in their prioritization process, adding that the CWA 303(d) program is positioned well. Mr. Havard emphasized that the states and territories should focus on getting good work done and not on calculating the measures themselves, which is EPA's responsibility. He noted that the objective is restoring and protecting water quality, and that should be the priority.

With regard to the ATTAINS redesign, Mr. Havard reiterated that resources are available to assist states and territories with the transition, including the newly established regional data management coordinators and sources of funding. He said that states and territories should be ready to transition to the new ATTAINS system in the spring of 2017; meanwhile, EPA will be working on WQ-28 and will explore how to show in ATTAINS the interface between waters subject to plans. Turning to data management, Mr. Havard highlighted the improvements in data management tools at the state and national levels, as well as the potential for their integration, and he stressed that better presenting more data, and the sources of the data, will facilitate more engagement and ultimately better water quality outcomes. He noted that EPA will explore the possibility of linking the Data Discovery tool with EPA Pro UCL and of standardizing the data that goes into the Water Quality Portal database.

Mr. Havard referenced the varying types and timing of effectiveness monitoring, and that effectiveness monitoring is relatively new or rare for many jurisdictions, highlighting the need for EPA and states, tribes, and territories to share examples of approaches to and tools for effectiveness monitoring. He also noted the many ways in which state CWA 303(d) programs are coordinating with monitoring programs. Mr. Havard commended the states, tribes, and territories that are using citizen monitoring data; reiterated the value that this can have for engagement; and emphasized the need for EPA and the states, tribes, and territories to share methods of promoting, collecting, and using citizen data to fill data gaps. He added that EPA will explore the sharing of waterbody-specific data collected by other federal agencies, and he noted the need to improve the monitoring of healthy waters for the sake of protection. Elaborating on the protection issue, Mr. Havard said that participants expressed both optimistic interest and uncertainty in it. He said that EPA will build on the conversation here as it continues to develop informational materials to clarify the Protection Goal and provide assistance in developing state healthy watersheds assessments.

Addressing "alternatives," Mr. Havard re-emphasized that TMDLs remain the primary tool of the CWA 303(d) program, but he acknowledged that there can be circumstances in which an "alternative" may be more efficient and effective in meeting water quality standards. He

added that the decision to pursue an “alternative” involves an array of considerations, and the 2016 Integrated Reporting Memorandum can help in that regard. Mr. Havard referenced the discussion regarding timing for reaching water quality standards, saying that it is an important consideration when choosing to pursue an “alternative,” but that it is open-ended, depends on the situation, should be revisited periodically, and may be influenced by a 2022 check-in. Mr. Havard emphasized that the 2022 check-in mentioned in the Integrated Reporting Memorandum is for “alternatives” articulated in the initial years of Vision implementation, and not, e.g., for an “alternative” identified in 2021. He also noted the participant interest in using watershed-based plans as an “alternative,” the fact that the necessary coordination between the CWA 303(d) and CWA 319 programs already is occurring in some places, and that EPA will continue advancing this cross-program coordination at the Headquarters and regional levels.

Mr. Havard reiterated the general sentiment that engagement is critical to the success of the CWA 303(d) program. He added that it is helpful to put a comprehensive picture before stakeholders and to get their reactions. He also noted that the TMDL-Lite screening concept might be a useful tool to give stakeholders a rough understanding of their respective pieces of the pie regarding pollutant loadings contributions and reductions, whether for the development of TMDLs or “alternatives.”

Mr. Havard then turned to the integration discussion from earlier in the morning. He emphasized the unique value of wasteload allocations in the MS4 context, as they can help add a quantitative element to the “maximum extent practicable” process. He noted that EPA and the states, tribes, and territories will need to continue to explore ways to share tools and approaches to develop “permit-friendly” TMDLs or to more easily integrate wasteload allocations into MS4 permit requirements. Mr. Havard concluded his remarks by acknowledging the challenge of merging cleanup and water quality standards objectives, but also the role that TMDLs and “alternatives” can play in this regard.

(2) Tom Stiles, KS: Send-Off Remarks

Mr. Stiles began by explaining that, over the winter, he and Traci Iott of Connecticut called all of the states to take the pulse of where they were with their respective programs, and the resulting stories were astounding and inspiring. He said that their jaws dropped at the amount of effort being put into moving programs ahead. He surmised that the participants would leave the training workshop and not change their programs, that they knew before they arrived where they were headed and what to do, but that they likely picked up a few useful nuggets.

Mr. Stiles noted that, in 2011, when he, John Goodin, and Eric Monschein were talking about the direction of the CWA 303(d) program, they borrowed inspiration from John F. Kennedy, to put a man on the moon. The CWA 303(d) Vision was born of that inspiration; but, he clarified, there is strategy, which is what is intended to be done, and there are tactics, which is how to do it. Mr. Stiles likened the CWA 303(d) Vision to a bundle of tactics rather than a strategy. He said that the strategy is to meet water quality standards with the programs, authorities, and resources available. He quickly added that there is still a place for structure

and plans, but he noted that the best laid battle plan dissolves right after first shot is fired. Mr. Stiles explained that Clean Water Act programs face the challenges of both: (1) how the landscape responds to water falling on it and how that water collects in stream systems; and (2) how human activity and human nature are altering those landscapes and altering that response. He described both events as very stochastic and fuzzy and analogized the programs to being in the fog of war trying to accomplish things.

Mr. Stiles highlighted the size of the country and the fact that it is a lot to cover. To get success, he said, it is necessary to go small, to scale efforts down to a level at which real influence can be had on hydrology and land use – that landscape response. In addition, a small scale reduces the number of people to convince that implementing measures to mitigate these impacts is important. Mr. Stiles said that prioritizing is scaling down; it is creating a workable set of tactics that achieve the objective.

Mr. Stiles suggested that there is a strategy embedded in water quality standards. “Forget the moon,” he said, “there will be a man on Mars before some of the water quality standards can be achieved.” He added that the real strategy is improving water quality; the focus should be on moving the needle.

Resuming the military analogy, Mr. Stiles noted that, in the Revolutionary War, the Americans jettisoned the traditional approach to battle in favor of ambushes from trees; “that was an ‘alternative,’” he exclaimed. He clarified that there still is a place for structure, but there are opportunities to whittle down big problems into something that is manageable. Mr. Stiles referenced the prior day’s breakout session on “alternatives,” highlighting the fact that his group spent the first 30 minutes arguing over whether it would be more beneficial to pursue an “alternative” in the situation at hand or just develop a TMDL at the start. He emphasized that states and territories are not abandoning TMDLs; rather, they are recognizing that sometimes an “alternative” is available and are capitalizing on good ideas, available resources, and interested partners to improve water quality in ways that do not necessarily comport with a traditional TMDL.

Mr. Stiles then switched to the topic of assessment, which he declared to be the most important element at the moment. He said that it will prove whether or not they have made a difference. He highlighted the fact that 2022 will mark the 50th anniversary of the Clean Water Act, and people will ask what has been accomplished in those 50 years. He said that they need to get positioned to answer this question, that they need to start putting together success stories, but monitoring and assessment is needed to do that.

Speaking to the state, tribal, and territorial participants in the room, Mr. Stiles recommended not focusing on the measures, not to teach to the test. He advocated doing what needs to be done to make a difference and let EPA fit that work to WQ-27. He added that the objective is water quality, not credit in the measures. Mr. Stiles emphasized that EPA is focused on the Vision, and the states, tribes, and territories are focused on change, which he said is okay since EPA is the guardian of the process and must author the national message, and states, tribes, and territories must produce results on the ground to support that message.

Mr. Stiles continued by providing quick assessments of progress on the Vision Goals. Regarding prioritization, he said that the mission is accomplished. He warned of priority creep, recommending that states and territories prevent an inflation of their lists so that they actually can accomplish those most important objectives. He added that if everything is a priority, nothing is. Turning to “alternatives,” Mr. Stiles referred back to his military analogy: there are many trees to use; it is always possible to fall back in formation, but if the opportunity arises, take the shot. On assessment, Mr. Stiles reiterated that the information most needed is that which will provide a basis for the stories in six years. He noted that uses matter more to the public than criteria and pollutants; thus, the needle that the CWA 303(d) program needs to move is the one regarding uses, and if it cannot do that, it needs to be able to explain why. Mr. Stiles addressed integration and engagement together, suggesting two questions to ask of these partners: (1) what can you do for me; and (2) what do you need from me to help you move the needle, to implement your work so that water quality is improved. He added that the “show and tell” is nice, but action is the purpose of these goals. Lastly, Mr. Stiles deemed protection to be the rookie, and noted that rookies do not run the clubhouse; they know their place, and their time will come.

Mr. Stiles concluded by highlighting how far the program has come since 2012, and despite significant staff transition at all levels. He said that states, tribes, and territories have taken off and are pursuing results. He added that everyone is starting to understand one another better, what each needs and how to work together. Mr. Stiles suggested that the program’s business model is not the Hunger Games, with districts paying tribute to the capital, nor is it Die Hard, with individuals trying to save the day despite federal intervention; rather, it is ten regions of states, tribes, and territories with unique characteristics and sociology coming together to build a national program. He noted that the template is well in place now, with everyone better understanding where similarities begin and where differences continue to exist, and that is okay. He added that the CWA 303(d) program could be a good model of coordination for other Clean Water Act programs.

Mr. Stiles said that the people of the CWA 303(d) program are government, but they are not bureaucrats; they are advocates for change. He emphasized that this is the point of the Vision. Mr. Stiles declared: “There is urgency to get something done, so be quick, but don’t hurry. Move with purpose. Do not let being right get in the way of being successful, and move that needle. Misbehave if you have to; you will be forgiven as long as you move the needle.”

APPENDIX 1: TRAINING WORKSHOP AGENDA



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AN INDEPENDENT, NON-PARTISAN ENVIRONMENTAL EDUCATION AND POLICY RESEARCH CENTER.

2016 NATIONAL TRAINING WORKSHOP FOR CWA 303(d) LISTING & TMDL STAFF

NAVIGATING THE COURSE

National Conservation Training Center
Shepherdstown, West Virginia
June 1-3, 2016

TRAINING WORKSHOP AGENDA

**This project made possible through a cooperative agreement with the
United States Environmental Protection Agency**

PURPOSE OF THE TRAINING WORKSHOP

To provide an opportunity for state, tribal, and territorial staff from Clean Water Act Section 303(d) Listing and TMDL Programs—along with their federal counterparts—to learn about and discuss how to more effectively achieve water quality restoration and protection, through collaboration and innovation.

WORKSHOP OBJECTIVES

- Learn about **progress made** by states, tribes, territories, and EPA with regard to key program responsibilities, particularly in light of the CWA 303(d) Program Vision.
- Learn about **new and improved tools and data systems** for decision-making and water quality data reporting.
- Advance **mutual understanding** among states, tribes, territories, and EPA about the role and nature of alternatives to TMDLs.
- Learn and discuss how effectiveness monitoring and other data needs of the CWA 303(d) Listing and TMDL Programs may be **realized through collaboration** with other CWA programs, other agencies, and the public.
- Learn methods of **integrating with other programs** to improve waste cleanups and the relationship between TMDLs and MS4 Permits.
- Better understand the **needs of and challenges facing** other states, tribes, territories, and EPA.
- Enhance the **network of listing and TMDL professionals** by expanding and improving communication among the states, tribes, and territories and with EPA regions and Headquarters.

OUTPUTS

No. 1: A final report summarizing presentations and discussions from the training workshop. The report will include a summary of individual input from workshop participants and may serve as a reference for program personnel.

No. 2: A summary report of state and territorial CWA 303(d) Program Vision prioritization framework documents, identifying key characteristics of each framework.

AGENDA

Tuesday, May 31

Arrival, Check-In, and Registration

- | | |
|-------------------|--|
| 3:00 pm – 8:00 pm | NCTC Check-In and Training Workshop Registration
Main Lobby
Murie Lodge, Lounge Area |
| 6:00 pm – 7:30 pm | Dinner
Commons Dining Room |
| 8:00 pm – 9:00 pm | Informal Welcome
Murie Lodge, Lounge Area |

Wednesday, June 1

Training Workshop Day 1

6:30 am – 8:15 am

Breakfast
Commons Dining Room

8:30 am – 9:30 am

Welcome, Introductions, and Training Workshop Overview
Auditorium

Greeting and Introductions

Adam Schempp, ELI

Opening Remarks

Benita Best-Wong, EPA HQ

Training Workshop Overview

Adam Schempp, ELI

9:30 am – 10:15 am

Session #1
Vision Priorities – Lessons and Next Steps
Auditorium

Overview of State Prioritization Frameworks

Adam Schempp, ELI

Vision Priorities and Program Overview

Jim Havard, EPA HQ

Session #1 Outcome:

- *Participants will learn what other states and territories have prioritized, for purposes of the CWA 303(d) Program Vision, and how they selected those priorities.*

10:15 am – 10:35 am

Morning Break

10:45 am – 11:30 am

Session #2
The ATTAINS Redesign
Auditorium

Overview of the ATTAINS Redesign and Its Progress

Shera Reems, EPA HQ

Dwane Young, EPA HQ

Session #2 Outcomes:

- *Participants will learn about the changes that are being made to the ATTAINS data system.*
- *Participants will learn about how the Integrated Reporting process and the measures reporting process will work in the new ATTAINS data system, including key dates.*

11:30 am – 12:30 pm

Session #3
Data Discovery and Assessment Tools
Auditorium

Introduction: Finding Water Quality Data / The Water Quality Portal

Dwane Young, EPA HQ

Data Assessment for CWA 303(d) Listing in South Carolina

Wade Cantrell, SC

The Data Discovery Tool

Dwane Young, EPA HQ

Session #3 Outcomes:

- *Participants will learn about digital tools being used to retrieve data and perform water quality assessments.*
- *Participants will be introduced to the Water Quality Portal.*
- *Participants will learn about the Data Discovery tool, a digital interface to query, summarize, quality control, and display data from the Water Quality Portal.*

12:30 pm – 1:15 pm

Lunch
Commons Dining Room

1:30 pm – 3:00 pm

Session #4
Effectiveness Monitoring
Auditorium

Assessment Goal – Effectiveness Monitoring

Rosaura Conde, EPA HQ

Using Probabilistic Monitoring to Assess the Effectiveness of Stream Management Efforts

Larry Willis, VA

Integration of NY's Monitoring Program into NY's Vision Approach

Ken Kosinski, NY

Facilitated Discussion

Session #4 Outcomes:

- *Participants will learn a variety of approaches to effectiveness monitoring in different contexts, and results of those efforts.*
- *Participants will learn more about the challenges to and opportunities for effectiveness monitoring in existing networks and programs.*

Potential Discussion Questions:

- In what other ways have your programs conducted effectiveness monitoring, and with what success?
- In order to track and document success, what is the greater need: more data faster or more controls and a longer timeframe?
- How do you achieve and demonstrate outcomes?
- How do you determine when, after implementation has started, effectiveness monitoring should occur?

3:00 pm – 3:20 pm

Afternoon Break

3:30 pm – 4:30 pm

Session #5
Monitoring Data Challenges and Solutions
Auditorium

Registration Responses Regarding Monitoring

Adam Schempp, ELI

Facilitated Discussion

Session #5 Outcomes:

- *Participants will learn about effective methods for collaborating with the monitoring program.*
- *Participants will learn how others prioritize their data needs.*
- *Participants will learn about potential additional sources of monitoring data and how others have procured those data.*

Potential Discussion Questions:

- How does your CWA 303(d) program prioritize its data needs?
- What have you found to be valuable tools, procedures, agency structures, or other means of communicating those data priorities to the monitoring program and other data providers?
- What sources of data outside the monitoring program have you found to be particularly helpful for any CWA 303(d) program

purpose (e.g., for operations, assessment, TMDL development, adaptive management, and determining effectiveness)?

- What sources of financial support have been important to producing the monitoring data on which you rely?

4:30 pm – 5:30 pm

Session #6
Protecting Healthy Waters
Auditorium

A Preliminary Conceptual Framework for the CWA 303(d)
Vision's Protection Goal

Doug Norton, EPA HQ

Facilitated Discussion

Session #6 Outcomes:

- *Participants will learn about and discuss different ways of implementing the Protection Goal.*
- *Participants will learn about the content and state-specific products coming from the ongoing Preliminary Healthy Watersheds Assessments.*

Potential Discussion Questions:

- Protection approaches and WQ-27 and WQ-28: what might count for which measure?
- How and where may protection approaches link to the CWA?
- What examples are out there already?
- What questions about protection would you most like to see answered?

6:00 pm – 7:00 pm

Dinner
Commons Dining Room

8:00 pm – 10:00 pm

Bonfire

Thursday, June 2

Training Workshop Day 2

6:30 am – 8:15 am

Breakfast
Commons Dining Room

8:30 am – 9:30 am

Session #7
Alternatives – Work in Progress
Auditorium

Alternatives under the CWA 303(d) Program Vision – A Few Key Reminders

Menchu Martinez, EPA HQ

Coordination between the CWA 319 and CWA 303(d) Programs on Alternatives

Lynda Hall, EPA HQ

Jim Havard, EPA HQ

Region 6 Coordination on Reviewing NPS-only Watershed Plans as Category 5-Alternatives

Richard Wooster, EPA R6

Nebraska's Approach to Alternatives and the Collaboration with EPA Region 7

Laura Johnson, NE

Tabatha Adkins, EPA R7

Results of ELI Research into the Many Approaches to Addressing Water Quality Problems

Adam Schempp, ELI

Session #7 Outcomes:

- *Participants will better understand the multiple expectations of a watershed-based plan that is designed for both CWA 319 and CWA 303(d) program purposes.*
- *Participants will learn about an example of coordination between a state and an EPA Region in the development of an innovative alternative approach.*
- *Participants will learn various ways that states, tribes, and territories have addressed water quality problems significantly or completely in the absence of a TMDL.*

9:30 am – 9:50 am

Morning Break

10:00 am – 11:20 am

Session #8
Alternatives Breakout Assignment
Breakout Rooms, Various Locations

This session will consist of six breakout groups, with each group being assigned one hypothetical water quality problem to solve using “alternatives.” Each participant is assigned to a group based on his/her topic preference expressed prior to the training workshop.

Session #8 Outcome:

- *Participants will gain experience in working collaboratively to develop alternative plans that are more likely to meet water quality standards and be counted under the measure.*

11:30 am – 12:30 pm

Session #9
Conclusions from the Breakout Assignment
Auditorium

Facilitated Discussion

Session #9 Outcome:

- *Participants will learn how others approached the problems presented and the pros and cons of those various approaches.*

12:30 pm – 1:15 pm

Lunch
Commons Dining Room

1:30 pm – 3:00 pm

Session #10
Breakouts by Region
Breakout Rooms, Various Locations

This session will consist of nine breakout groups, one for each region (regions 1 and 2 being combined), each with state, tribal, territorial, and EPA participants from that region as well as the regional liaison from EPA Headquarters.

Session #10 Outcomes:

- *Participants will better understand the needs, challenges, and views of others in their respective regions.*
- *Participants will have resolved, or at least advanced conversation on, issues important to the states, tribes, and territories of the region.*

3:00 pm – 3:20 pm

Afternoon Break

3:30 pm – 6:00 pm

Afternoon Activities

6:00 pm – 7:00 pm

Dinner
Commons Dining Room

7:30 pm – 8:30 pm

Informal Evening Session
MurieLodge, Lounge Area

An Introduction to the Regional Data Coordinators

Friday, June 3

Training Workshop Day 3

6:30 am – 8:15 am Breakfast
Commons Dining Room

8:30 am – 10:00 am **Session #11(a)**
Integration with Other Programs – MS4 Permitting
Auditorium

CWA 303(d) Program Integration: National-Level Activities

Ruth Chemerys, EPA HQ

**Update on EPA Efforts to Support Translating TMDLs to
Stormwater Permits**

Jamie Fowler, EPA HQ

Greg Schaner, EPA HQ

Facilitated Discussion

Session #11(a) Outcomes:

- *Participants will learn what progress has been made at the national level regarding integration with OST, OWM, Superfund, OGWDW, and other federal agencies.*
- *Participants will learn methods for integrating TMDLs and MS4 Permits.*

Potential Discussion Questions:

- How have you been linking your TMDLs and stormwater permits (i.e., overcoming the translation challenge between load-based WLAs and BMP-based MS4 permits)?
- What tools, procedures, agency structures, or other means of facilitating coordination have you found useful when it comes to MS4 permitting and TMDL development?

10:00 am – 10:20 am Morning Break

10:30 am – 11:15 am **Session #11(b)**
Integration with Other Programs – Cleanup Efforts
Auditorium

“WQS... we’re supposed to meet standards?”

Jason Sutter, AZ

Facilitated Discussion

Session #11(b) Outcome:

- *Participants will learn methods for collaborating with cleanup program staff regarding restoration efforts and meeting water quality standards.*

Potential Discussion Questions:

- Have others experienced similar issues where the cleanup program's goals were met but water quality was still degraded?
- In what instances have cleanup efforts resulted in water quality standards being attained, and was the CWA 303(d) program involved?
- What methods of coordination have improved, or could improve, the likelihood of cleanup actions meeting multiple agencies' goals?

11:15 am – 12:00 pm

Training Workshop Wrap-Up
Auditorium

Summary and Next Steps

Jim Havard, EPA HQ
Adam Schempp, ELI

Send-Off Remarks

Tom Stiles, KS

12:00 pm – 12:45 pm

Lunch
Commons Dining Room

NCTC Check-Out & Departure

1:00 pm

Departure of Shuttle Bus for Dulles Airport
Murie Lodge, Parking Lot

APPENDIX 2: PARTICIPANT LIST

2016 NATIONAL TRAINING WORKSHOP FOR CWA 303(d) LISTING & TMDL STAFF NAVIGATING THE COURSE

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Shepherdstown, West Virginia
June 1-3, 2016

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EPA Headquarters

(Not all will be in attendance every day)

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APPENDIX 3: COMPILATION OF WORKSHOP PARTICIPANT EVALUATIONS

Fifty-two workshop participants completed an anonymous Participant Evaluation Form (provided in the resource binder materials). The combined numerical results from the evaluations indicate an overall event rating of “Very Good-to-Excellent,” across all categories. In addition to the numerical responses, we received many written comments, which are reproduced here.

Participant Evaluation Form: Compilation

Scale: 5 = Excellent, 4 = Very Good, 3 = Satisfactory, 2 = Fair, 1 = Poor

A. The Workshop—Overall

Information Presented	5 (27)	4 (24)	3 (1)	2 (0)	1 (0)	AVG: 4.50
Workshop Materials	5 (26)	4 (22)	3 (4)	2 (0)	1 (0)	AVG: 4.42
Workshop Organization	5 (42)	4 (10)	3 (0)	2 (0)	1 (0)	AVG: 4.81
Group Interaction	5 (33)	4 (17)	3 (2)	2 (0)	1 (0)	AVG: 4.60
Session Facilitation	5 (35)	4 (16)	3 (1)	2 (0)	1 (0)	AVG: 4.65
Conference Facility (NCTC)	5 (48)	4 (4)	3 (0)	2 (0)	1 (0)	AVG: 4.92

Comments:

- This conference never fails to deliver. Thank you EPA for supporting, ELI for implementing, and organizers for setting the agenda. Facility always awesome.
- All presentations should be available as handouts.
- Adam did an extraordinary job keeping the conference moving like a well oiled machine. The training binder is very well done. Table of Contents is much appreciated—using it got me to material faster and allowed me more time to pay attention to speakers.

- Considering I work mostly within the 319 program, I found a lot of the training to increase my knowledge of the programs (TMDL and 319) integration with each other. Facilities were great with the gym.
- Lots of material packed into a few days! Thank you for the work that went into being able to have this workshop. Still “learning the language” and think a pre-meeting would help those new to this work or those who need a refresher. Keep binders—use back at office and are good to take notes on. Could we get an electronic copy too of the workshop materials? That is helpful to talk with others back at work.
- Facility was excellent as always. Lots of information covered. Maybe a few more breakout session would be appropriate.
- Groups—break out good, would have liked more large group discussion.
- Headquarters staff mainly observed—would’ve liked some participation
- Information—I expected more from the EPA. More answers and less “I have no idea.”
- Materials—lots of extra handouts. Not ELI’s fault, presenters should have provided some sources—specifically EPA HQ who knows better.
- Well run as usual. NCTC is perfect venue for a workshop.
- Outstanding as always! Especially the organization!
- Overall very well planned and executed workshop. Special thanks to Adam for this leadership and efforts to set a tone that facilitated a great discussion.
- Really enjoyed the discussion on MS4s and relationship with TMDL implementation. It would be interesting for the next workshop to have a summary or comparison of which states have certain WQS, evaluate which parameters, and the primary type of TMDLs that are developed. For example, does a state have numeric criteria; do they assess bacteria as fecal, *E. coli*, entero, beach admissions, etc.; do they pursue implementing nutrient TMDLs or bacteria?
- Social activities very informative as well. Need more time.
- The breaks and evening events were great times to continue conversations.
- This is usually a great oiled machine. Great job ELI!
- Facility needs to have cranberry juice. Slides could use more photos. ELI once again has done an excellent job with agenda development, keeping things on-track, dealing with people’s individual needs.
- Too bad that data managers couldn’t participate in main program more. Many of them do more than data managing for the 303(d) program, so would have benefited from full participation in the main workshop program agenda.
- Well organized and run. Great facility except very poor cell coverage. Appreciated that topics kept to agenda time. Great list of potential discussion questions to help facilitate discussions for the topics.
- Good job having all presentations shared in hard copy.
- This is by far the best organized workshop I have ever attended. I thank ELI staff for a job well done.
- Very well done. Smooth sailing. Adam is a great facilitator. Good to hear state perspectives instead of just EPA talks.
- Workshop slide presentation materials should either be in color or slides should not contain color-dependent information.

- The entire conference went very smoothly—Adam and others from ELI were excellent in guiding discussions and making sure everyone had a microphone.
- Would be good for the EPA to come to this meeting with a good description/ expectation of the path forward. Some of the session focused too much on what has been done to date and not on where we are headed or what needs to be done next. The discussion will be better if there was a good balance of the old and the next steps.
- Would be interesting to have technical session-TMDL methodology—what work states are doing with TMDLs.
- More info on assessments/ ATTAINS always welcome.
- Sessions were very useful.
- How states complete assessments. Thank you for all the hard work and coordination!!! Well organized and good amount of break w/o overloading. Enjoyed getting out early to decompress on Thursday!
- Good job! Thanks for organizing another great training workshop. This year was the first for me regarding field trips. Nice to get off campus when you can't work the trails because of ticks and chiggers.
- Wish you could be a little more flexible on the shuttles but a great workshop.
- The workshop continues to be an excellent conference and training. ELI staff do an excellent job organizing and maintaining schedules during the workshop and making participants' experience worthwhile and comfortable.

B. Goals and Outcomes

How effective was the workshop in satisfying the stated goals and intended session outcomes?

5 (16) 4 (25) 3 (5) 2 (1) 1 (0) **AVG: 4.19**

How successfully did the workshop meet your own expectations?

5 (24) 4 (20) 3 (3) 2 (2) 1 (0) **AVG: 4.47**

Comments:

- 1st time to a conference, I was happy with the overall experience. I've learned I have a lot to learn! Also happy to hear that many states have same questions, concerns, and back log of work.
- Conflicting comments from EPA HQ, EPA Regions, and 12 months of conference calls.
- EPA HQ and Regional staff are often not on same page: problematic.
- Having the opportunity to listen to other states both in the planned session and casual interactions has reinvigorated me to bring back new ideas as well as give me confidence that many of the program adjustments that we have made are on track.
- I think the workshop discussed relevant topics without too much detail.
- Just so much information to cover that it's very hard to spend the appropriate amount of time on each topic.

- Loved the alternatives breakouts—but wanted more discussion from the report outs about actual alternative ideas and less about agency coordination.
- This was my first year attending, and I had concerns regarding applicability, accessibility, etc. These concerns were unfounded, and I’m coming away with quite a lot of food for thought.
- Workshop covered the issues I am interested in – alternative action, TMDLs, problematic monitoring, etc.
- More time w/ regions would be nice, but understandable—short schedule with lots to do! More on new and improved tools and data systems. A lot of alternatives—but more on actual projects—looking forward to reading the compendium—ELI thanks. Integration—how to meet needs with assessments/ monitoring would be beneficial topic.
- I had thought I would be better able to understand this TMDL body of knowledge and 303(d) listing. I have been working in the field for 20+ years but I saw there is still so much I don’t know. Complex issues!
- Really enjoyed discussions outside of just TMDLs. This allows our state to send more than one person to the workshop.
- Good info on big picture stuff that is going. Hearing where else people are getting funding (PENN Foundation) was useful.
- As in previous years, the workshop exceeded my expectations.

C. Specific Sessions

Session #1: Vision Priorities—Lessons and Next Steps

- A bit of time allowed here for questions and discussion would have been great.
- Good overview.
- Good summary of state prioritization strategies. Nice review by Jim.
- It was a good idea to include each state framework in ELI website.
- Met goals/ outcomes although the presentations from Adam and Jim overlapped quite a lot. Somewhat interesting but not that useful.
- Most important session for my state. Jim Havard did a great job discussing this topic. Adam Schempp and his staff provided an excellent summary of what states are making their prioritization.
- Sounds good.
- Good information as I was vaguely familiar with the new vision but was not provided more in-depth information.
- Very good—appreciated discussion of nationwide vision priority. Excellent summary and synthesis.
- Would have liked an example or two presented like the other session did with state reps “telling their story.”
- Now that we know what the priorities are, including the pollutants, the program should start having more focused conversations about how to improve program performance (eg.. More implementation-ready TMDLs) around those priorities/pollutants.

Session #2: The ATTAINS Redesign

- Awesome. Love Shera's format. ATTAINS live demo was great.
- Useful and informative. Glad that Dwane did not give the PPT presentation as provided in the notebook—kept as a reference b/c so many venues have already gone over it. Jeopardy game effective at communicating key facts.
- Good presentation, looking forward to the new ATTAINS
- Great walk through.
- Informative.
- I don't use ATTAINS but I do use GRTS and it is a similar system. Both systems are a little similar and at least now I have a better idea if input is necessary.
- The introduction that EPA made wasn't very clear. Does our state need to do this?
- Really impressed with the web-design and features. Nice job.
- See how successful it is next year.
- Super helpful to know it will be available soon—and to know that training is planned for the near future.
- Very good! You've done a great job!
- Very nice! Shera and Dwane are great at explaining the benefits/uses of the new system.
- Very good to be provided an overview of the redesign and what to expect in the future. I think it will be important for the states to have the funding resources to make changes to the internal system to upload to ATTAINS.
- Liked demo. My staff have said ATTAINS has been hard to use since only use it one time a year typically. So password expires there and there is a long process to get new log-in and it takes some time.
- Great presentation—especially the demo—extremely helpful. EPA support for re-evaluating the IR process within staff would be beneficial. Use the new system to look at how the decisions are reached.
- Very good session. Presenters were dynamic and made data management presentations interesting and some were very entertaining.

Session #3: Data Discovery and Assessment Tools

- Good info, nice to see new tools to more easily accessed data, especially USGS data
- Great presentation, especially about how R stats is being used.
- Great suggestions regarding additional sources of external or sister agency data.
- Missed most. Enjoyed Dwane's demo.
- It will be helpful to have examples/webinar in the use of these applications. In order to increase the monitoring cover in terms of river miles monitored, we need more support from EPA in order for state agencies have available all the water quality data collected by other entities like universities (grant conditions).
- Liked the PPTs but had to make connections between them. It was confusing to know how they related—maybe Adam or someone could help facilitate and provide connectivity between PPTs in a session.
- This has promise. Issues will be with documenting QA/QC. I hope to be able to apply the tools.
- This presentation was very organized and provided excellent insight into the South Carolina assessment methodology and evaluation process.

- Very interesting—see some utility for these tools.
- State presentations were most helpful!
- Very good reminder and demonstration of the tools and where to find data.
- It has been beneficial to have USGS incorporated. What about the other DOI datasets? Can the tool get those datasets—or can EPA lead to get data incorporated. FWS is collecting a lot of stream temp to assist with climate change issues.
- Very informative session and I now have knowledge on the use of additional tools to assist with assessments.

Session #4: Effectiveness Monitoring

- A few examples within the packet to refer to?
- Felt like a superficial discussion. Would like guidance on experimental design, SAP, SOPs, QAPPs, analysis, and cooperation across agency.
- Good presentations—lots of good nuggets of info. I am not a fan of the word “effectiveness” in terms of monitoring because I think it introduces an inherent concept of metric. Instead, I think we should focus on “implementation”.
- More emphasis in the design phase for a probabilistic monitoring program. Please include examples of development of their kind of monitoring.
- More how to do it-pre/post-study design examples.
- Nicely facilitated discussion among the states after the formal presentations. Also liked the consolidation of the responses from registrations.
- Need clear path moving forward.
- Need to focus on effectiveness monitoring.
- Monitoring session were not very illuminating, surprisingly.
- Presentations were interesting, but seemed to focus on larger scale, even statewide, effectiveness monitoring. It would have been good to see more examples of smaller scale, watershed, effectiveness monitoring.
- Really liked hearing about examples. TMDL—would like more information—model seems like to would be too general to use at an 8 or 12 digit scale. Factors seemed to be statewide? For future years—can it 1st be defined as to what terminology means. That is, what do effectiveness and monitoring mean?
- VA prob. monitoring fascinating and provided food for thought.
- Very interesting sessions and presentations.
- Enjoyed learning about what other states are able to do with their monitoring programs. It would be good to be able to coordinate with others to learn more. Just touching the surface regarding actual assessment processes.
- This section was the most useful as I am in charge of monitoring and technical aspects of my state’s 319 program. Now I can take a look at other states’ effectiveness monitoring.
- Not clear how the two state presentations were intended to help states do effectiveness monitoring under the vision. We need examples of how to do BMP and site-specific effectiveness monitoring.

Session #5: Monitoring Data Challenges and Solutions

- Good session, good information.

- Heavy on 319—not effectiveness monitoring. However, this is how many states fund TMDL implementation. Not that useful a session (for us).
- Integration of monitoring programs—assessment manufacturing, TMDL, effectiveness—overlap—other states expansion.
- It would be great if we had metric requirements applied to federal agencies like BLM, Forest Service, etc. Some states may work well with this.
- Liked PPT of registration responses. Also thought discussion questions good— like hearing states’ responses. Would have liked to have more on challenges—below EPA detection limits—how to use that detail in a TMDL. Methods for water quality testing—some states below detection levels. What do then?
- There was good discussion on this topic. I’d like more state examples of monitoring/303(d)/TMDL/NPS coordination, and example of larger scale monitoring and assessment of HUC 4, 5, or statewide.
- This session felt like it was lacking some focus.
- Very interested to learn that many states share the same challenges while others have figured out solutions/can work around.
- Robust discussion—someone made a good point that emphasis on monitoring doesn’t match with the realities of resources.
- The pre-survey work was helpful.

Session #6: Protecting Healthy Waters

- Good presentation with lots of food for thought, the questions posed at the end provided lots of good ideas and discussion.
- Great presentation and will provide needed support to states. Great resource.
- Great questions, no answers. Need more guidance.
- Great discussion on what could be considered a protection approach, but no resolution. Lots of great ideas. “Common questions” general good idea. Nice presentation as way to set up discussion only session that ran over the time, but impressive that the discussion was so lively given it was the last session of the day.
- I like the idea of protective plans, and would like to see how 319/106 grants to be awarded to local governments to help development watershed plans.
- Little late for a presentation—would’ve liked something more active/engaging than a presentation may have kept more attention.
- States need more guidance and agreement (among EPA) about what protection is and what the options are or may be for implementing.
- Still having difficulty reconciling protection in the TMDL program. Seems like 319 is more appropriate, or 5-alt.
- The list of actions to protect healthy waters is the best part of the presentation.
- This was a tough one for the last session of a long day—it felt a little disconnected. I still don’t know what the Preliminary Healthy Watersheds Assessments is . . .
- The discussion questions at the end of the presentation were way too vague and did not guide the discussion very well.
- Useful information presented, but the inclusion/emphasis of WQ-27 and WQ-28 for discussion was distracting. People using the word “plan” a lot, but should have more of a focus like “protection plan” for an impaired waterbody—which are the focus on the two

measures. It was obvious from the discussion that the expectation of this vision goal is unclear or misunderstood. People were using the term “plan” a lot—but I think the original idea of protection was more akin to the prioritization goal – more of a strategy or framework, which may include some individual plans, that describes and demonstrates how each state is addressing the protection goal.

- What does a healthy water mean? One that has NO TMDLs or Cat4 waterbodies on it? What if all waters are impaired—all segments impaired?
- How does this relate to anti-degradation or does it?
- If healthy waters are in federal lands—who is responsible for protecting those lands/waters?
- Is Cat1a healthy water?
- Wish the discussion were earlier in the day and not rushed after 5:30. Still had lots of great information.
- Yes, great to get verdict or acknowledgement for a state to do the right thing when so much time is often spent on putting out fires and need to address impaired waters.
- Protection is a priority for our state so a little more information on what other states as well as what EPA expects was helpful.
- Hope to have final guidance/white paper on what counts under the measure no later than the next ELI meeting.
- Very good session that provided me with ideas to explore for the protection of surface waters.

Session #7: Alternatives—Work in Progress

- Good info.
- Great information. Nice to see Jim and Lynda working together. Also nice to hear that Regions 6 and 7 are ahead of the curve with respect to alternatives. Now time for the rest of EPA to catch up.
- I’m still not sure what to think about alternatives. States need very clear guidance to provide counsel to stakeholders and public at the watershed scale.
- Like the concept of alternative plans.
- 319 presentation was very confusing—hard to follow.
- Given 319 requires watershed-based plans. I was familiar with the planning process as an alternative. It’s helpful to know that we may receive credit for some of the upcoming planning efforts.
- Obvious now that alternatives will not be a big part of the program. Hence, let’s make sure we are spending most of our program/ELI time talking about improving the main part of the program (i.e., TMDLs).
- Very good session which extended into break out session (10). Next time this will have had some time to mature so may have a few more examples.
- Very good session.
- Very helpful. Coordination with 319 key to success in implementing TMDLs.
- We could have used quite a bit more time here—alternatives are being pushed hard by EPA without sufficient detail. I would have loved to have more Q&A discussion.
- Very important topic that everyone wants to know the answer to b/c most don’t want to move forward and expend efforts to have it rejected by EPA.

- Was very helpful to see examples that other states are working on.

Session #8: Alternatives Breakout Assignment

- Always keep this part in.
- Better with smaller groups and some more up-front information on the scenario.
- Excellent concept! We had some really good discussion—facilitation could have been a bit better in my particular session, so the focus on alternative ideas to address the issue was better. Their charge seemed to be interpreted as a checklist to have an answer for each question.
- Favorite session. I really enjoyed the collective brainstorming and experience sharing. There is nothing like a group that qualified all getting together to figure something out.
- Good exercise, lots of good information.
- Great session b/c encouraged people to speak up.
- Great!!!
- Group discussions were good but often strayed away from the specific project. People started talking about all kinds of other issues. Depending on whether that was the intent—just to get people talking—this may have been effective otherwise, needed someone to pull group back to specific project.
- Liked the format and chance to hear what other states are doing/would like to do in a specific issue or scenario.
- Somewhat frustrating exercise. It seemed like most of the participants approached this exercise without much, if any, experience dealing with watershed plans and the process needed to develop a plan. This exercise highlighted the difference between developing a TMDL and a watershed plan which when implemented will improve water quality.
- Our facilitator had difficulty following the directions on the handout. I think it would be helpful if all participants had the directions for the breakout activity.
- This was a great session, but due to many states not having experience w/ stakeholder or public, not interesting. Not sure if the states had made an effort to show this with the public.
- This was a really really great way to facilitate information exchange among states, as well as EPA. Great scenarios, very clear instructions for the facilitators and participants.
- Use actual example of an alternative plan.
- Very good.
- Very lively and informative discussion. Great selection of scenarios.
- While the individual scenarios were good, the report out from each group wasn't particularly useful or enlightening . . .
- Enjoyed hearing ideas and simulations and references between states—great ideas expressed by many states.
- Unfortunate that HQ was instructed to be a silent participant in breakout sessions. Many folks at HQ are senior members of the program and have much to contribute. Also did not like optics of HQ folks being set apart from other participants—bad optics. The vision was a collaborative process and we need to maintain that relationship.
- Was extremely helpful to hear from other states and their perspectives and obstacles when addressing impairments and providing for restoration.

Session #9: Conclusions from the Breakout Assignment

- All groups seem to have a great understanding of potential partners and stakeholders. The problem is HOW to get these partners to buy into the process (Fed. Gov, Tribes, Farmers, Commodity groups, local governments are usually very resistant). This is the major problem with setting a specific time to meet WQS. This is a huge uncertainty. A suggestion for next meeting: “Stories of the Impossible” how some states got the impossible to buy in.
- Concise but insightful summaries. Good brainstorming session—not sure report out session was as useful.
- Hard to understand w/o graphics like bullet list of comments from discussions.
- I would have preferred to hear more about the discussion and insights from groups than how to do 5-alts.
- N/A.
- None.
- Very instructive. Excellent amount of time allotted. We didn’t feel rushed, but used every minute of the time given. Conclusions session was also instructive and helpful.
- Recap could’ve been kept to 5mins/group
- Some of the modules were a little too similar. More variation with more focus would be helpful.
- Too much repetition; however, very good to see range of examples for which an alternative plan could be effective
- Observation—were the projects real? They all encompassed very small areas (except Crooked Creek where size not given). If areas this small are going to need 5, 10, in some cases 20 years to restore, that is daunting! Just think how many—that is daunting! Need to consider alternate approach to get to implementation—many of these need strong public outreach. Maybe need to develop strategic outreach/communication program—hire communications staff, not just scientists/engineers.
- Tremendously helpful. Helped with abstract concepts relation to project implementation/approach by EPA into much more solid, tangible ones.
- Very interesting—enjoyed it.

Session #10: Breakouts by Region

- Always provide opportunities to get together to discuss items as needed and plan for future regional meetings and discuss material topics.
- Apparently EPA staff were asked to facilitate.
- Convince Region 2 to participate in the workshops
- Could use more time.
- Excellent session—could use additional hours with EPA.
- Good discussion—should’ve been longer.
- Great session. Always good to have the regions together. Have themes, bullet points to talk about—ours was a little scattered. It would help to have a central theme to focus on to guide discussions.
- Helpful, useful.
- Productive and informative. Continue breakout sessions next year.
- Productive for our region.

- Shorter ones like these every day.
- Somewhat disheartened that Alternative TMDLs will not really provide relief from backlog. Work will continue on protecting and preservation of further degradation.
- Thanks for providing the list of questions/topics for our regional break out. We referred to it throughout our discussion. Excellent amount of time allotted.
- This was the only opportunity that we get to have a face-to-face meeting with our states. As such, we try to make the most of it. We always run out of time!
- Very useful and helpful. Each state has in common received good information from the regional office. We made significant progress on the process for alternative plan approval. Do not lose this breakout in future workshops.
- Very useful. Should be longer.
- Wasn't able to address state questions and concerns—got caught in WQ-27/28 and headquarters comments.
- Went really well.
- Very good. Could use 2 hours.
- With funding cuts, I would suggest considering making this a longer session (maybe ½ day more).
- You scheduled the perfect amount of time for this—thank you!
- Very helpful discussion of common issues.

Session #11(a): Integration with Other Programs—MS4 Permitting

- An issue we all need to keep updated on.
- EPA should have discussed more details on the MA/NH MS4 permit. Much structure and measurable than rest of the county. Very helpful conversation.
- Good info. Glad to see EPA is getting on top of the issue with more guidance to states.
- Very good.
- Incredibly helpful.
- Informative update. Interesting to hear approaches taken by the various offices, especially how they dealt with specific challenges.
- Organize webinar regarding state efforts to implement TMDL segments in their MS4 permits.
- Really great to include OWM and would love to see them more.
- Really informative.
- Very complex—may be worth having a few states present how they handle this, such as Michigan or Connecticut.
- Are we on track with this vision goal? What are the milestones? Are we meeting them?
- Very good info and good topic. Good for future discussion because MS4s are a primary factor in all aspects of the 303(d) program.
- Would have been good to hear about how MS4 could also support TMDL.
- Would like more time/discussion on this subject in the next year or two.
- Would have liked more info on what Ruth presented on—not just handouts that we have to read to get the materials later when back to “daily grind.”
- I am a 319 person, so I don't really care about permitting, but I understand that there's two sides of TMDL.

- Key component to implementing TMDLs. Is this same dialogue happening w/ permit folks about implementing TMDLs through MS4 permits?
- This was helpful, it was good to learn from other states experience. Also the list of resources was helpful.

Session #11(b): Integration with Other Programs- Cleanup Efforts

- Emphasize this! Seems to be an issue in every state. Trying to integrate TMDLs into other programs can be problematic.
- Great presentation even if the hazardous waste component was not a particular issue in my state the discussion was good and appeared to effect many states. Maybe 80,000 mines!! Wow!
- How about cleanup efforts related to remedial investigations due to industrial timber activities? How can P.1 fit into TMDL implementation plan?
- Great presentation.
- Great topic; great presentation. Please, let's have more of these next year.
- Important issues. WQS are not remediation standards in our state either. Data collected on Superfund sites should be uploaded to store.
- Very interesting and challenging. On a related topic, and maybe one in a future workshop is how states and tribes are dealing with recent spill or contamination events in terms of TMDL and response/remediation. For example, if there is a spill or contaminant release that causes a water quality problem, do states cut the impairment on their 303(d) cuts, and if so, do they move them to 4b if there is an approved remediation plan in place?
- We need more of these discussions too.
- Are we on track with this vision goal? What are the milestones? Are we meeting them?
- AZ—good practical example. AZ work with USFS may have been what helped AK remediation effort. Same message to Federal agency. Could do DOT session.

Training Workshop Wrap-Up

- Clearly very organization- and results-oriented; this is much appreciated.
- Keep 'em going!
- Need a shorter wrap-up.
- We were all here and we can read the agenda. We need a wrap-up with insight and actions—not a repeat of the day.
- Summary was unnecessary. Too repetitive.
- Thank you – see you next year.
- The EPA “quick” wrap-up/observations at the end of the days’ sessions was redundant and not all that well done. Need to stop within time limits and not re-give presentations.
- Really good reminders. Perhaps a little less detail would have been okay.
- I appreciate knowing about the future travel. We need to get approval (for putting on a list) of out-of-state travel nearly 1 year in advance.

Other Comments or Suggestions

- Looking forward to next year!
- Awesome!
- Another great workshop!

- Can't wait for WQ-28 guidance—will a working group form or can states preview early draft?
- Excellent meetings. Suggest more break-out sessions; groups make it easier to speak-up.
- Great conference overall!
- Great week! Really got some good ideas to take back and hopefully implement in my state.
- Great work by ELI. The additional “free activity” time gave us another opportunity to bond with our peers and a good respite from all the deep discussions.
- I ♥ ELI.
- New media tools—map stories: innovative web pages, survey, etc. These are usually developed by conservation/watershed groups not by states.
- Please consider establishing/identifying the Regional Data Coordination for Region 2. Also consider transferring this person to the CEPD office in San Juan, Puerto Rico.
- Put “End of the Day” EPA summary as the first agenda item for the next day.
- Really liked Thursday afternoon break and field trips. This should continue in future workshops. Also, thank you for the social opportunities. Thank you to EPA HQ, especially Jim Havard, for the continued support in making this workshop happen and to Adam and the rest of the ELI staff for all you do. Great job!!
- Some PPT slides were wordy and confusing.
- Struggled with unique language used in this workshop.
- Thanks for putting state abbreviations on name tags!
- The afternoon activities were a great way to break up the workshop.
- This is a very purposeful and productive workshop. Keep it up.
- This year felt more focused on EPA than states. Previous meetings felt more inclusive from a state perspective. It's great that more people from EPA HQ were here, but I wish the overall themes/sessions were more inclusive or encouraged their participation rather than them observing.
- These meetings are extremely helpful in take-away suggestions. Presentations from states are useful—maybe a session on lessons learned (i.e., failures). Meeting is a good way to influence EPA HQ on priorities. Session on revising TMDLs with project examples.

APPENDIX 4: TRAINING WORKSHOP WEB PORTAL & ELI'S *CWA 303(d) PROGRAM RESOURCE CENTER*

ELI continues to maintain and make publicly available a companion website for this training workshop and past training workshops. Materials and presentations from the 2016 training workshop are available at <http://www.eli.org/freshwater-ocean/cwa-303d-training-workshops>.

Other resources that are relevant to the mission and work of state and territorial CWA 303(d) programs and tribal water quality programs are available at the Institute's *CWA 303(d) Program Resource Center*, at <http://www.eli.org/freshwater-ocean/state-tmdl-program-resource-center>.