DEQ

TMDL Advisory Group Meeting
July 29, 2025 3:00 PM
DEQ's Blue Ridge Regional Office

Roanoke River, Tinker Creek, and Wolf Creek Benthic TMDL Study

Regional TMDL Coordinator:

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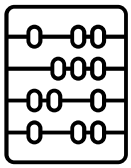
Project Background

Three streams within Botetourt County, Roanoke County, and the City of Roanoke are impaired for Virginia's Aquatic Life designated use, due to benthic macroinvertebrate bioassessments. The stream segments include 3.16 miles of the Roanoke River, from Niagara Dam downstream to the mouth of Back Creek, 11.87 miles of Tinker Creek, from its confluence with Buffalo Creek downstream to its confluence with the Roanoke River, and 4.5 miles of Wolf Creek, from its headwaters downstream to its confluence with the Roanoke River. Section 303(d) of the Clean Water Act requires states to develop Total Maximum Daily Loads (TMDLs) for waters that are impaired and do not meet water quality standards. A draft benthic stressor analysis was completed and presented to the public at the initial TMDL study meeting in April 2024. Stressors identified by the draft analysis to be managed with a TMDL were nutrients in the Roanoke River and sediment in Tinker and Wolf Creeks. Public comments indicated a preference for more data collection to support the conclusions of the benthic stressor analysis and the formation of a TMDL Advisory Group to guide study development. DEQ has commenced with additional data collection to be used to update the analysis document and an advisory group of diverse stakeholders within the Roanoke River watershed was formed in June 2025.

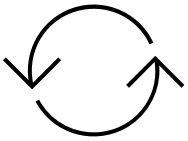
TMDL Advisory Group Members & Alternates

Primary Members	**Member Alternates**
Clifton Bell	Jeffrey Tyler
Doug Blount	Josh Fridley
McKenzie Brocker	Marcus Aguilar
Keri Green	Mary Colligan
David Gruber	Joe Rasnake
Lawrence Hoffman	Amanda Marsh
Mark Richards	
Larado Robinson	Michelle Cock
Kristina Sage	
Scott Shirley	

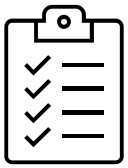
Meeting Objectives



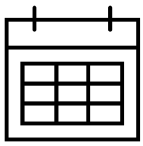
Set TMDL Advisory Group expectations & rules



Cover Project Updates



Discuss in-depth topics brought up at previous meetings



Set project timeline and future meeting topics

TMDL Advisory Group Expectations & Rules

- More than half of the appointed members or alternates must be present at a meeting for a quorum.
- The Freedom of Information Act (FOIA) requires that minutes (a summary of the meeting) be prepared and posted to the Townhall website (www.townhall.virginia.gov/) within 10 days following the meeting.
- The role of the group is advisory only. The group's primary responsibility is to collaboratively contribute to regulatory process that is in the best interests of the Commonwealth as a whole.
- Speak one at a time; interruptions and side conversations are distracting and disrespectful to the speaker. "Caucus" or private conversations should take place during breaks.
- Because advisory group meetings are public meetings, any member of the public may attend and observe the proceedings. However, only group members may actively participate in the discussions. Non-members are encouraged to work with members with common interests to make their concerns heard.

*See full group guidelines in appendix A.

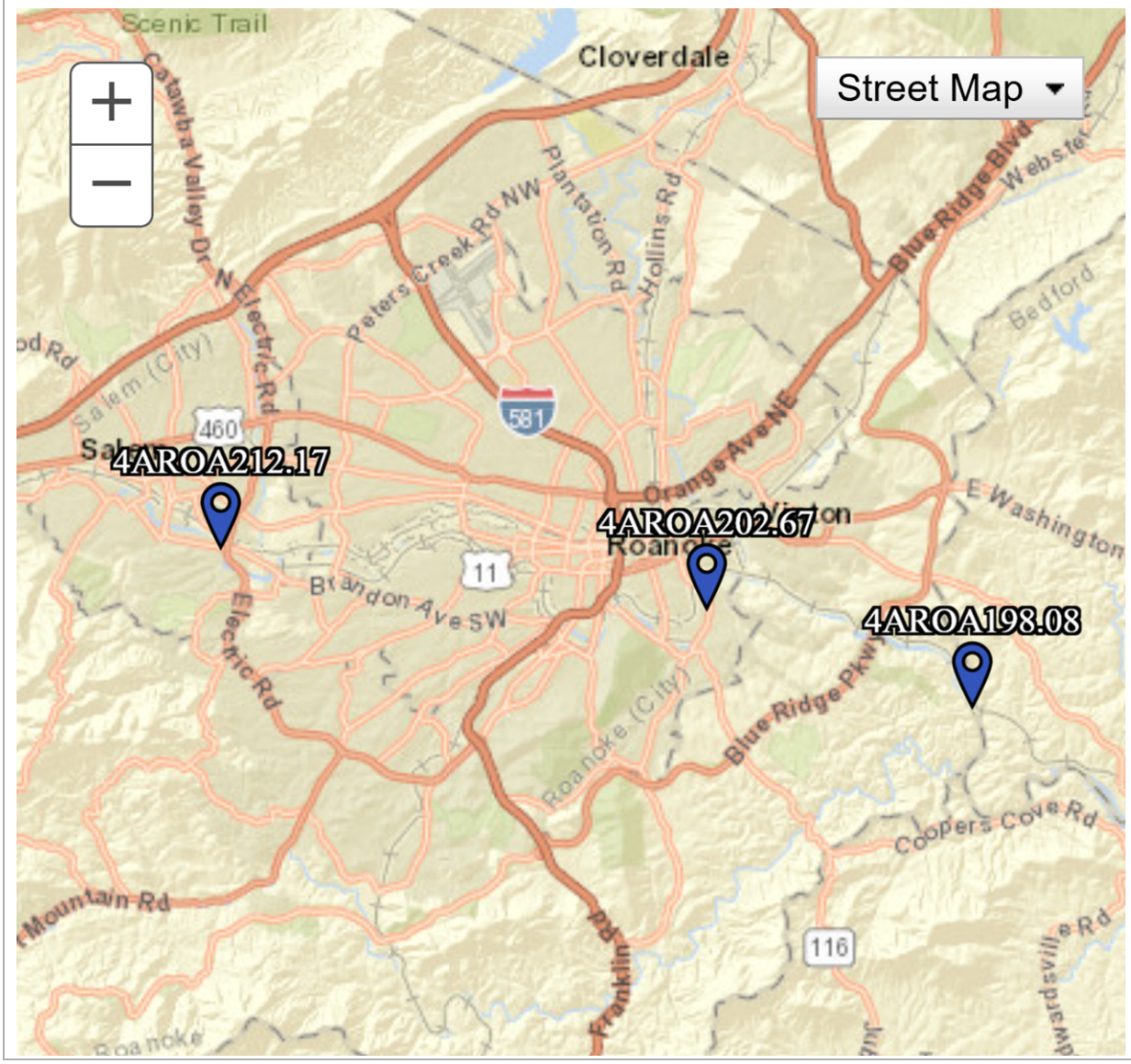
- ☐ Would we like meeting minutes to need approval by the group prior to posting?
  _____
  _____
- ☐ Do we wish to set time limitations for persons addressing the group?
  _____
  _____
- ☐ How do we want non-group members to be able to express their concerns during meetings?
  _____
  _____
- ☐ Meeting breaks and expressions of comfort with decisions, do we like the current expectations, or do we have other suggestions?
  _____
  _____
- ☐ Meeting intervals, how often would we like to meet as a group?
  _____
  _____
- ☐ Comments: _____
  _____

**** 5 MINUTE BREAK ****

Project Updates

DEQ Additional Sampling:

DEQ will be sampling algae biomass and speciation at the monitoring stations of 4AROA212.17, 4AROA202.67, and 4AROA198.08 to collect supplemental data for the Roanoke River portion of the benthic stressor analysis in August 2025. Previously, analysis was relying on the results of one sampling event of biomass and there was no speciation data. When the analysis undergoes its next draft, there will be three separate biomass sampling events, with replicates, available to analyze. The Academy of Natural Sciences at Drexel University will also be determining the species of algae growing which will help determine food sources and limiting nutrients relating to the algal growth.



Third Party Additional Sampling:

Brown and Caldwell recently submitted a Quality Assurance Project Plan to conduct sampling in the study area. They have collected and submitted data in the past that was incorporated into the April 2024 draft of the benthic stressor analysis. DEQ reviewed their plan, suggested some edits, which they completed, and looks forward to reviewing the data.
TAG members, Clifton Bell of Brown and Caldwell, and Joe Rasnake of BMI, have offered to discuss the sampling plan and goals of their upcoming studies.

Benthic Stressor Analysis Drafting:

Dr. Robert Brent, of James Madison University, completed the initial drafts of the benthic stressor analysis for this project. He is being contracted once again to complete an updated draft that will include the additional data collected since its first presentation in April 2024*. Algae data is processed at third party laboratories, and we will not likely have the results to give to Dr. Brent until December (2025)/January (2026) at the earliest. Once he receives the data, he will begin incorporating it into the analysis. This data may or may not change previous conclusions of the document. Once he is prepared to present another draft of the updated analysis, he will present that to this TAG. Following that presentation, this project will be able to proceed with the development of a plan.
*See the copy of this benthic stressor analysis at DEQ's website, at the TMDLs Under Development section, under the Roanoke River, Tinker Creek, and Wolf Creek project drop down
https://www.deq.virginia.gov/our-programs/water/water-quality/tmdl-development/tmdls-under-development

Notes:

**** 5 MINUTE BREAK ****

Topics of Interest: Advance Restoration Plan vs. TMDL

The Vision for the Clean Water Act Section 303(d) Program identifies the Restoration Goal, which encourages the identification, development, and implementation of the most effective tool for restoring waters – be it a TMDL or other approach. In most cases, a TMDL is the first step in restoring these waters, providing the pollution budget that serves as a foundation for implementation plans, regulatory activities, and/or on-the-ground restoration. The Restoration Goal recognizes there are cases in which pursuing restoration approaches in **advance** of developing a TMDL may provide a more immediately beneficial or practicable path to restore water quality. An advance restoration plan (ARP) is a near-term plan, or description of actions, with a schedule and milestones, that can be immediately beneficial or practicable to achieving WQS. Impaired waters for which a state pursues an ARP to achieve water quality standards would remain on the CWA 303(d) list and still require TMDLs until water quality standards are attained.

- An ARP does need to clearly demonstrate how water quality standards will be achieved for EPA to include it under the 303(d) performance measures
- Considerations for developing an ARP
  - Level/type of work already being done
  - Proportion of point/nonpoint source loadings
  - Engagement of local stakeholders
  - How localized the impairments and or contributing sources are
- Pros of ARP
  - Faster plan development
  - Emphasis on voluntary remediation efforts
  - Adaptable to management efforts and milestones
- Cons of ARP
  - Not shown to be as effective when point sources aren't regulated
  - Extended investment should TMDL be necessary to achieve water quality standards after ARP
  - Needs extensive stakeholder buy-in

- Is it possible to get potential point and nonpoint sources to reduce loadings **voluntarily** on a large scale?

  _____

  _____

- Is there work already being done that will contribute to reduced sediment and nutrients in these watersheds?

  _____

  _____

- What are the funding benefits to a TMDL vs. ARP being completed?

  _____

  _____

- What are the regulatory and voluntary actions that could address the benthic impairments?

  _____

  _____

- After this discussion, do we still want to engage the idea of a plan in advance of a TMDL?

  _____

  _____

Watershed logistics to consider:

Tinker Creek and Wolf Creek are tributaries to the Roanoke River, facing different impairments than the river segment in this study. The entire watershed that encompasses all three impaired waters is 512.5 square miles. There are 11 separate MS4s with service areas covering portions of each watershed. All three waters are included in previously developed TMDLs that address PCBs and E. coli. A TMDL addressing sediment impacting benthic macroinvertebrate communities was developed for the Roanoke River upstream of the impaired river segment of in our current study. Tinker Creek and Wolf Creek were excluded from this original TMDL.

Roanoke River – The Roanoke River is impaired for benthic macroinvertebrates above the river segment of current study, but the stressors have been identified as PCBs and sediment. Nutrients are not identified as a stressor upstream of the impaired segment currently under study. There are 132 permit holders within the entire watershed and 63 permit holders directly upstream of the section under study. Land uses in the watershed directly upstream of this impairment include 60% developed land, 32% natural cover, and 8% agriculture. Niagara Dam is also present at the top of this impaired stream segment. Dams do affect benthic communities in multiple ways, and this dam was identified in the draft stressor analysis as another likely stressor. Dam presence/absence cannot be managed with a TMDL.

Tinker Creek – This impaired stream has the highest amount of agricultural influence with 27% of the watershed being pasture, hay, or croplands. Urban development makes up another 31% of the watershed and 42% of it has more natural land coverage. There are 12 permit holders in this watershed.

Wolf Creek – This creek is the most urbanized of all three streams but is unique in that there are no individual permit holders discharging directly into the watershed. It is, however, within an MS4 service area. Nonpoint source urban runoff and stormwater are the main sources of stressors within this watershed. The land within the hydrologic unit it belongs to is greater than 66% developed. Less than 4% of the land coverage is influenced by agriculture, and the rest of it is forested.

Notes :

**** 5 MINUTE BREAK ****

Topics of Interest: Nutrient Monitoring & Station Descriptions

At the previous public meeting, there was a question about nutrient monitoring that has occurred on the Roanoke River since the previous benthic stressor analysis draft. This was an excellent question and warranted a group review since this data (2024-2025) will also be sent with the additional algal data for the updated stressor analysis.
*See the full data set used for the draft benthic stressor analysis at DEQ's website, at the TMDLs Under Development section, under the Roanoke River, Tinker Creek, and Wolf Creek project drop down https://www.deq.virginia.gov/our-programs/water/water-quality/tmdl-development/tmdls-under-development

DEQ monitors trend sites throughout the state on both lakes and rivers. Field parameters are measured at the time of sample collection for dissolved oxygen, pH, specific conductivity, and temperature.

At riverine trend sites, these lab parameters are collected every other month: E. coli, enterococci, fecal coliform, dissolved calcium, dissolved nitrate, specific conductance, total alkalinity, total kjeldahl nitrogen, total nitrogen, total phosphorus, total solids, total suspended solids, and turbidity.

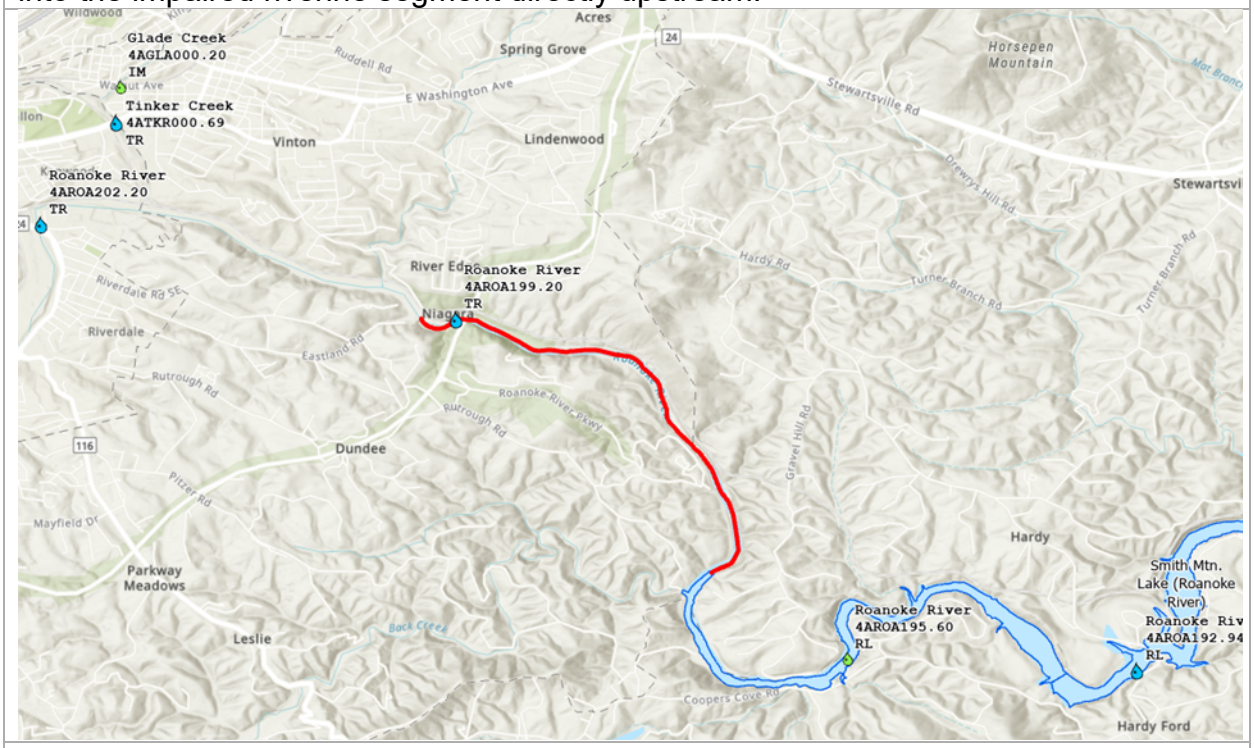
At lake trend sites, these lab parameters are collected every month between April and October: E. coli, enterococci, fecal coliform, ammonia, total nitrate, total nitrogen, total phosphorus in orthophosphate, total phosphorus, pheophytin A, pheophytin ratio, chlorophyll A, chlorophyll B, and chlorophyll C.
*See appendix B for descriptions of each listed lab parameter.

Roanoke River Trend Sites (within 10 miles upstream of impairment to 10 miles downstream of impairment)	**Year Data Collection Began**	**Station Type**
4AROA202.20 Location: 13th Street Bridge in the City of Roanoke	8/21/1967	Riverine
4AROA199.20 Location: Beneath the Blue Ridge Parkway Crossing of the river	9/26/1967	Riverine
4AROA192.94 Location: Smith Mountain Lake, near the Hardy Ford Boat Launch	4/25/1983	Lake

Previous data analyzed within the benthic stressor analysis included data through 2023. In 2024 and 2025, additional ambient data collection has been taken at the 4AROA195.60 lake station. This station has been sampled with all the same sample parameters as a trend site since 4/27/2021.

Downstream lake stations are important because this impairment ends at the designation for where Smith Mountain Lake (reservoir) begins. Reservoirs are not assessed for aquatic life standards using benthic macroinvertebrates the same way

riverine segments are. While the assessed impairment ends where the reservoir begins, the identified stressors present within the Roanoke River are measurable downstream in the reservoir as well. Referencing precedent, Smith Mountain Lake is included within the Roanoke River PCB TMDL because the PCBs that are present and causing the impairment in the river upstream, are also present and causing an impairment downstream in the reservoir. There currently is no standard by which to assess reservoirs using benthic macroinvertebrate communities. Algal growth and nutrient loadings can affect reservoirs in other measurable ways, such as depleting dissolved oxygen through eutrophication and causing harmful algal blooms. This study is not meant to address nutrient loadings within the reservoir, however, the measured nutrients and observed effects of those nutrients within the reservoir can provide insight into the impaired riverine segment directly upstream.



Notes :

**** FINAL 5 MINUTE BREAK ****

Project Timeline Estimate

First TAG Meeting
July 2025
Introducing TMDL Advisory Group members and set goals for group and project

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Benthic Stressor Analysis Amendments
January 2026-May 2026
Submit data to contractor once results are received

TAG Meeting
May 2026-June 2026
Presentation of the new draft benthic stressor analysis

TMDL Modeling
Summer 2026
Modeling transport of stressors to set reduction goals

TAG Meeting
Summer/Fall 2026
Presentation of modeling results

Plan Development
Fall/Winter 2026
Study/Plan writing

TAG Meeting
Winter 2026
Group check-in during study/plan development

Final Public Meeting
Winter 2026/2027
Presentation of final draft of study/plan, opening of 30-day public comment period

Plan Submission
Winter/Spring 2027
Submission of final study/plan to necessary entities

Checking-In on Meeting Management

Q. Did you like the format of the discussion guiding handout?

Q. Did you like the built in 5-minute breaks?

Q.

Future Topics of Interest & Additional Comments

Appendix

Reference materials to support TMDL Advisory Group discussion.

Appendix A.

(Updated March 10, 2025)

Advisory Group Guidelines

Background

The State Water Control Board adopted Public Participation Guidelines (PPGs) to develop regulations and collect stakeholder input. The PPGs allow the use of advisory groups such as Regulatory Advisory Panel (RAP), Technical Advisory Committee (TAC), Stakeholder Advisory Group (SAG), Technical Regulatory Committee (TRC), or Work Group.

Establishment of a Group and Statutory Requirements

- Membership to an advisory group, including alternates, is at the discretion of the Agency Director.
- Recommendations and appointments for membership are person-specific. Organization must submit the name of an individual and may also name an alternate.
- Potential group members are encouraged to identify alternates early in the regulatory development process to ensure that an organization can still be represented when the appointed member is unable to attend. Alternates for an individual should share an affiliation with the member approved for the advisory group.
  - Alternates are encouraged to attend meetings as observers when the appointed member is in attendance, to keep abreast of issues discussed at meetings if they need to stand in for an appointed member. When the appointed member is present, alternates present are considered members of the public, and should not actively participate in the discussions.
- More than half of appointed members or alternates must be present at a meeting for a quorum to be present.
- Advisory group are public bodies and must follow the requirements of the Freedom of Information Act (FOIA). All meetings of the group are public meetings and be noticed in advance in the Virginia Regulatory Town Hall website, Commonwealth Calendar, and DEQ website.
- Advisory groups meetings of are meetings of a public body under the FOIA, which requires all business to be conducted at legally announced public meeting. As such, members should refrain from interactions outside of meetings discussing the advisory group topic, including by email or other electronic communications.

- Meetings may be audio or video recorded by the agency, advisory group members, or members of the public as long as the use of the recording equipment does not physically interfere with the meeting.
- FOIA requires that minutes (a summary of the meeting) be prepared and posted to the Townhall website (www.townhall.virginia.gov/).
  - Unless the group establishes that minutes must be approved, minutes do not have to be approved. Draft minutes must be posted within 10 days after the meeting with a final posted within 3 days of approval. If the minutes do not need approval, the final must be posted within 10 days after the meeting.

Role of the Group

The purpose of the group is to collect stakeholder input, assist in associated regulatory processes, and help the Department balance the concerns of all those interested in the action being undertaken.

- The role of the group is advisory only. The group's primary responsibility is to collaboratively contribute to regulatory process that is in the best interests of the Commonwealth as a whole.
- Group members are expected to devote the time and energy needed to ensure that they will be active participants of the regulatory advisory group, including attending scheduled meetings, contributing to group discussions, as well as actively listening as other members share their ideas.
- The group's goal is to reach a consensus and make recommendations to the Department and Board. In the regulatory and public policy arena, consensus is defined as a willingness of each member of the group to be able to say that he or she can live with the decisions reached and will not actively work against them.
- This is not to say that everyone will be completely satisfied by the results. It is necessary; however, that each participant come prepared to negotiate in good faith around complex and sensitive issues.
- Also, because the group represents many different interests, all members should expect to compromise in order to accomplish the group's mission.
- If no consensus is reached, staff will present the differing opinions to management and the Board.
- Voting, per se, is contrary to a consensus-based process, but people may be asked to demonstrate their strength of feeling for or against a particular idea and may be asked to help set priorities during the process.

General Guidelines for Discussions of the Group

- Listen with an open mind and heart - it allows deeper understanding and, therefore, progress.

- Stay positive; focus on the issue, not individuals, and present solutions alongside problems.
- Speak one at a time; interruptions and side conversations are distracting and disrespectful to the speaker. "Caucus" or private conversations should take place during breaks, not during the work of the group.
- Be concise and avoid repeating points, unless you have new or different information to share.
- Simply note your agreement with what someone else has said if you feel that it is important to do so, it is not necessary to repeat it.
- Review materials to be discussed prior to meetings so you are prepared to participate in the discussion. Do not assume that the group will revisit previously discussed issues at later meetings.
- If you miss a meeting, get up to speed before the next one, as the group cannot start over.
- Turn off all cell phones; take and make all calls outside the room.

Participation by Persons not on the Group

Because advisory group meetings are public meetings, any member of the public may attend and observe the proceedings. However, only group members may actively participate in the discussions.

- Non-members are encouraged to work with members with common interests to make their concerns heard.
- As warranted, the Department will provide a means for those persons not on the group to make their concerns known, provided it is not disruptive or does not inhibit the advancement of the work of the group.
- For groups working on regulations, those persons not on the group also have an opportunity to be formally heard during the 60-day public comment period on the proposed regulation.

When a Group Assisting in Regulation Development is Finished

- The Department will develop the draft regulations and submit recommendations to the Board. The documentation sent to the Board will also be sent to members of the group.
- Areas where the group was unable to reach consensus or where the Department's recommendation differs from the group's recommendation will be identified in the material sent to the Board.
- The Board will decide if the Department's recommendation should be modified before the proposed regulation is promulgated. After Board approval, the proposed

regulation will undergo executive review and a 60-day comment period. Any member of the group or the public may provide comment.

- However, it is hoped that members of the group would actively support the work of the group during the public comment period if the regulation were essentially the same as that developed by the group.
- The Department may meet with the group to review public comments and Department responses prior to finalizing the summary and response document for the Board. This summary explains the Department's position on the comments (why the regulation was changed or was not changed).
- In addition, Department staff should send the summary and response document to commenters and all advisory committee members and post the document on the Department's web site.

- At the Board meeting, Department staff will recommend final action by the Board. At that time public comment on the regulation will be accepted in accordance with the Board's Policy on Public Comment.

When a Group Assisting in Something Other Than Regulation Development is Finished

In some cases, a group is working on developing a regulation, but on the collection of stakeholder input.

- In these instances, after the group makes its recommendations, Department staff managing the group will summarize the deliberations and outcomes and prepare recommendations for Department management.
- Areas where the group was unable to reach consensus or where the staff's recommendation differs from the group's recommendation will be identified in the material sent to Department management for a decision.
- Department staff will inform the group members of the decision made by Department management.

Appendix B.

Referenced Sample Parameter Codes:

Storet Parameter	Unit	MDL
Alkalinity, total	mg/l	1
Calcium, dissolved	mg/l	0.157
Chlorophyll-a trichromatic uncorrected	ug/l	0.1
Chlorophyll-a spectrophotometric acid. Meth.	ug/l	0.1
Chlorophyll-b trichromatic uncorrected	ug/l	0.1
Chlorophyll-c trichromatic uncorrected	ug/l	0.1
E.coli by colilert sm 9223-b	cfu/100ml	
Enterococci- me-mf n0/100ml	cfu/100ml	
Fecal coliform,membr filter,m-fc broth,44.5 c	cfu/100ml	
Nitrate nitrogen, dissolved	mg/l	0.009
Nitrite plus nitrate, total 1 det.	mg/l	0.016
Nitrogen, ammonia, total	mg/l	0.014
Nitrogen, kjeldahl, total	mg/l	0.03
Nitrogen, total	mg/l	0.045
Pheophytin-a spectrophotometric acid. Meth.	ug/l	0.1
Pheophytin ratio(od 663)spectro,before/after acid		
Phosphorus, in total orthophosphate	mg/l	0.01
Phosphorus, total	mg/l	0.005
Specific conductance	umhos/cm @ 25C	
TS residue, total solids	mg/l	10.8
TSS residue, total nonfilterable total suspended solids	mg/l	1.17
Turbidity	NTU	0.05

Definitions & Acronyms:

C
: acronym, Celsius, refers to temperature measured using the international thermometric scale.

cfu
: acronym, colony forming units, measure of viable bacteria cells within a sample.

cm
: acronym, centimeter, unit of length within the metric system.

Kjeldahl
: measurement of organic nitrogen compounds that can be converted to ammonia through digestion, including ammonia, organic nitrogen, and reduced nitrogen.

l
: acronym, liter, unit of capacity within the metric system.

MDL
: acronym, method detection limit, minimum concentration of a substance that can be detected using the laboratory methods.

ml
: acronym, milliliter, 1/1000th of a liter.

mg
: acronym, milligram, 1/1000th of a gram.

NTU
: acronym, nephelometric turbidity unit, measurement of the turbidity of a fluid.

Storet Parameter
: a unique identifier or code assigned to a specific type of environmental data that has been standardized by the EPA's storage and retrieval database.

ug
: acronym, microgram, 1/1,000,000th of a gram.

umhos
: acronym, micromhos, unit of measurement for electrical conductivity.

Unit
: a standard of measurement.