

**Lake Maumelle Watershed Management Plan
Policy Advisory Council
Meeting Summary
October 20, 2005**

Attendees

See Attachment A

Introductions/Background

Kimberly Brewer of Tetra Tech began the meeting by asking the Policy Advisory Council members to introduce themselves and reminding the group of the roadmap and schedule for developing the Lake Maumelle Watershed Management Plan. She then reviewed the objectives for the night's meeting including:

- Endorsing refinements to the Draft Goals and Objectives.
- Understanding the recommended indicators, assessment tools, and targets.
- Discussing and endorsing the preliminary targets.
- Discussing upcoming tasks.

Revisions to Draft Goals and Objectives

Concerns Raised

The discussion of revised draft goals and objectives began with Mr. Nestrud raising several concerns:

- He understood that these were Draft Goals and Objectives, as reflected in the last meeting summary, and should be referred to as such. The document forwarded before the meeting said "Revised Goals and Objectives" not "Revised Draft Goals and Objectives."
- He did not understand that he was agreeing to or endorsing goals and objectives at the last meeting (subject to revisions requested).
- The draft goals and objectives go beyond the mission of the project.

Regarding the first point, Ms. Brewer said Mr. Nestrud and the meeting summary were correct, the goals and objectives are draft and subject to revision during the more detailed assessment. She said the assessment could reveal that objectives need to be added or subtracted, or that the level of importance of objectives should be changed. However, Tetra Tech had requested input from the group on a starting point for goals and objectives that could guide the assessment. The goals and objectives will consistently be referred to as "draft" in the future.

Ms. Brewer next polled the group to determine if other members were unaware that they were agreeing to the Draft Goals and Objectives, subject to the revisions requested at the 9/8/05 meeting. Ms. Bell indicated that she was also unaware that she had voted for the Draft Goals and Objectives. Ms. Brewer said that at the last meeting Tetra Tech had reviewed the group protocols and rules for reaching consensus, and defined consensus as "being able to live with a proposal." After the presentation and discussion of the strawman goals and objectives, Ms. Brewer asked the group if they could "live with" the draft goals and objectives, subject to the revisions requested that night. Everyone shook their head yes (and no one objected). Tetra Tech interpreted that as a

consensus on the draft goals and objectives. Ms. Bell suggested having a more formal, clear statement that a vote is being requested/taken. All agreed that:

- When a proposal is on the table, Tetra Tech will ask members to raise their hands if they agree to or endorse the proposal (signaling a formal vote).
- The whole set of draft goals and objectives will be voted on by the group again at tonight's meeting, not just the three revisions requested. This will enable those members who were not aware that a consensus poll was being taken at the last meeting to vote at this meeting.

Mr. Nestrud's second concern was that the Goals and Objectives go beyond the project scope or mission: a scientific focus on water quality for drinking water supply protection. Other factors, such as recreation, should only be included to the degree that they impact water supply protection. He indicated that aesthetics should not be included in the goals and objectives, since he believes it is out of scope and too subjective. He said he was concerned to read in the Technical Advisory Council meeting summary that a tool was being proposed to evaluate development impacts on residents' and recreationists' watershed views (pursuant to the objective to allow limited recreation that reflects environmentally sound stewardship of the lake and maintain aesthetic enjoyment of Lake Maumelle and its watershed).

Ms. Brewer said that the reason Tetra Tech is having these discussions upfront with the Policy Advisory Council about goals and objectives is to determine what the comprehensive watershed management plan should address. Tetra Tech brought strawman goals and objectives to the first meeting based on:

- CAW's request for proposal for services to develop a watershed management plan, including developing a scientifically based, comprehensive watershed management plan that is supported by the communities and diverse interest groups.
- Previous studies conducted.
- Tetra Tech's scoping analysis.
- Review of recent articles/discussions about the lake.

Prior to the group's first meeting, Tetra Tech sent out the strawman goals and objectives, asking the group to come to the meeting with suggested revisions. Ms. Brewer stressed that it is one of the responsibilities of the group to determine what the comprehensive watershed management plan should address so that it can be supported. At the last meeting, Tetra Tech asked the Policy Advisory Council to delete, add to or revise the strawman goals and objectives to develop draft goals and objectives. At tonight's meeting, the group will review and vote on the exact wording of the three revisions requested at the 9/8/05 meeting, including the recreation objective. Also, since there was some confusion about the previous vote, the Council will vote on the entire set of draft goals and objectives.

[Note: To further aide in clarifying and formalizing meeting proceedings, future meetings will be tape recorded.]

Revisions to the Draft Goals and Objectives

Ms. Brewer said that the group had requested three revisions to the strawman goals and objectives:

- Overarching water supply goal – add quantity to the goal in addition to quality.
- Recreation objective – link uses and stewardship.

- Community values objective- add administrative feasibility.

The group reviewed and voted on each revision individually.

Overarching Water Supply Goal

Ms. Brewer said that based on recommendations from members at the last meeting, the proposed rewording of the overarching water supply goal is:

Maintain long-term, abundant supply of high quality drinking water for present needs and continuing growth of the community.

Ms. Althoff said a number of the Council members had expressed a desire at the last meeting to explicitly set a goal of non-degradation of existing water quality. Tetra Tech had said at that time it wanted to work with the Technical Advisory Council and come back with a recommendation at this meeting. She asked how this overarching goal, as stated, related to the goal of nondegradation. Ms. Brewer said that Tetra Tech had met with the Technical Advisory Council to discuss recommended indicators and targets related to water quality. Later in the meeting, Dr. Butcher will be presenting these recommendations, which essentially define what is meant by “high quality drinking water” in the goal above (see summary below). Ms. Brewer said that the proposed preliminary targets support the USEPA and ADEQ policy of nondegradation of high quality waters. However, to achieve a strict non-degradation target, as measured from existing water quality, it is likely that most undeveloped land in the watershed would need to be purchased to prevent future development. Ms. Althoff asked if the targets supported a goal to minimize degradation. Ms. Brewer said that they did.

The Council unanimously endorsed this revision as written in bold above.

Recreation Objective

Ms. Brewer said that based on recommendations from members at the last meeting, the proposed rewording of the recreation objective is:

Allow limited recreation that reflects environmentally sound stewardship of the lake and maintain aesthetic enjoyment of Lake Maumelle and its watershed.

Ms. Brewer reminded the group that recreation is secondary to the purpose of the lake: water supply. Therefore any recreation that occurs must be compatible with protection of the water supply. It is not allowed “by right,” but, currently, is an important use of the lake.

Mr. Nestrud reiterated his concern that recreation should only be studied or evaluated to the extent that limits may need to be placed on recreation to protect the water supply. He said that aesthetics should only be addressed in the study related to the aesthetics of the drinking water supply – such as taste and odor of the drinking water. He asked Tetra Tech to clarify what it meant by the term aesthetics in the draft goals and objectives. Ms. Brewer said that based on work to date, Tetra Tech perceived citizens would likely care about a number of issues related to aesthetics, depending on how they use the lake: taste, odor, and color of the drinking water; algal scum or highly turbid water for boaters and sailors; visual impacts from clear cutting or intense development for those living in the watershed, or those boating, sailing, hiking and picnicking. Ms. Brewer said that the taste, odor, algal mass, and turbidity could be estimated and predicted using the proposed water quality models. She said that Tetra Tech was proposing to address the visual impact with a watershed visualization tool, enabling the group to see graphically how different land use and forestry management techniques might look from sitting on the lake in a boat. There would not be a “target” associated with the analysis; the Council would provided input on which management options had the least visual impact.

Mr. Kevin Pierson said that he thinks that recreation and aesthetics are important, but agrees that they are not as important as the drinking water objectives. He said that this is reflected in the current prioritization of objectives, where recreation is given the third-tier and lowest category ranking.

One member said he was concerned that aesthetics are too subjective, and that some might use the term to try to regulate a color of house that they did not like.

Ms. Althoff and Pat Dicker said they thought that recreation was an important objective, both from how it might impact the drinking water supply and because Lake Maumelle is an important community recreation resource. A comprehensive watershed plan should address this objective.

Ms. Dickey and Ms. Bell suggested that Tetra Tech further clarify what it meant by “aesthetics,” and the degree to which meeting the water supply aesthetic objectives would also satisfy the recreation aesthetic objectives.

Ms. Brewer then asked the group to vote on the proposed revised recreation objective as worded above. A number of committee members supported the proposal, while a number opposed it. Ms. Brewer then asked the group to vote on the following proposal:

(1) Revise the recreation objective as follows:

Allow limited recreation that reflects environmentally sound stewardship of the lake.

(2) At the next meeting, define the term “aesthetic.” Based on that definition, present ways that aesthetics could be addressed in the watershed management plan. Show the linkage between the aesthetics of drinking water supply and recreation. The Council will then vote on if, and the degree to which, it recommends that aesthetics be part of the recreation objective (or any watershed plan objective).

The group unanimously agreed to the above proposal.

Community Values

Ms. Brewer said that prior to, during, and after the last meeting, some Council members stressed the importance of adopting a plan that is administratively feasible. Tetra Tech had planned to use this as a criterion in evaluating the different management scenarios, but given the level of importance people have given the criterion, Tetra Tech is recommending adding it to the Other Community Values objective. The revised objective would read:

Meet other community values, including:

- **Be economically competitive.**
- **Provide a strong tax base for communities.**
- **Minimize tax increases.**
- **Be administratively feasible.**

Ms. Brewer said that administrative feasibility applied to local governments who would need to enforce new development regulatory requirements if adopted, as well as to CAW. For example, would the local government have adequate staff and training to conduct development review, site inspections, inspections of best management practices, etc. Ms. Bell said it was important not to eliminate management options because they are not currently administratively feasible. Ms. Brewer said that management options would not be viewed according to existing staff only. Tetra Tech will present estimates about the level of staffing needed to implement different management

options, estimates of associated funding needs, and potential funding options. Tetra Tech will work with the Policy Advisory Council to compare existing resources to projected needed resources for the alternative management scenarios to determine which scenarios are the most administratively feasible. Ms. Brewer asked the group to vote on the proposed revision as written above. It was unanimously endorsed.

Overall Draft Goals and Objectives

Ms. Brewer asked the Council to vote on the proposal for the completed set of draft goals and objectives as follows:

- (1) The three revised draft goals and objectives as worded above.
- (2) All other goals and objectives in the document entitled *Revised Goals and Objectives for Discussion on 10/20/05* forwarded to the group prior to the meeting remain the same, except all references to “aesthetics” are deleted subject to provision # 3 below.
- (3) After presentation and discussion of the use of the term aesthetics at the December meeting, the Council will determine if and how the draft goals and objectives should be revised.

The Council unanimously endorsed the proposal for Draft Goals and Objectives as stated above. See Attachment B, Draft Goals and Objectives Endorsed 10/20/05.

Methods for Evaluating Draft Goals and Objectives

Dr. Jonathan Butcher next reviewed the methods for evaluating the draft goals and objectives. He defined key terms that will be used as part of the analytic decision framework approach that Tetra Tech will use to develop the management plan:

Indicator: Measurable or predictable quantities that can be used to track progress toward objectives.

Targets: Values of indicators that correspond to meeting an objective relationship between inputs and indicators.

Assessment Tools: Mathematical models and other tools that predict the response of indicators to changes in the watershed.

Since the last Policy Advisory Council meeting in September, Tetra Tech met four times with the Technical Advisory Council to develop recommended indicators, targets, and assessment tools. Detailed recommendations were forwarded to the Policy Advisory Council before the meeting for members’ review.

Mr. Butcher provided an overview of the selected assessment tools. These tools are designed to operate at different scales and to answer different management questions. The lake model will include CE-QUAL-W2 (an updated version of the tool than that previously used by USGS for Lake Maumelle) for 2-D general simulation of lake-wide response. It will also include EFDC for 3-D flow and transport to evaluate lateral variations and nearshore impacts.

The watershed model will be HSPF for watershed-scale simulation of flow, pollutant loads, and transport. The site scale models include the Site Evaluation Tool (for site scale development impacts and stormwater BMP evaluation) and the WEPP (for forestry practices and evaluation of impacts of unpaved roads).

Next Mr. Butcher provided an overview of the recommended indicators and targets. He said that the assessment will be used to attempt to achieve the recommended target condition or threshold. Where regulations exist, they are considered as minimum thresholds. Tetra Tech will work with

the Policy Advisory Council to compare how well management options meet multiple targets. This will provide the basis for the policy evaluation of tradeoff when there are competing objectives.

Below are the recommended indicators and targets, by major category. (Note: The table, *Preliminary Targets for Selected Indicators*, forwarded to the PAC prior to the meeting, provides more details, including a number of numeric targets and minimum thresholds).

Toxics

Spills, Herbicides and Pesticides

- At a minimum, meet regulatory requirements.
- Target: minimize any increase from existing levels of risk.

Disinfection Byproducts

- Regulatory: meet Drinking Water Disinfection Byproducts rule criteria for finished (treated) water.
- Target: maintain raw water concentrations of Total Organic Carbon (TOC) as close to 2 mg/L as possible.

Mercury

- Regulatory: Arkansas fish tissue mercury concentration action levels regulation and USEPA recommended fish tissue levels.
- Target: minimize increases in mercury loading and factors that increase mercury methylation.

Algal Toxins

- Keep algal productivity below levels that generate algal blooms.
- Target: established under general algal control strategy below, which will also help minimize risks from algal toxins.

Algae

- Regulatory: Arkansas narrative nutrient standard and USEPA recommended Ecoregional Criteria for lakes.
- Targets:
 - No substantive degradation in current conditions for chlorophyll *a*, phosphorus, and water transparency.
 - Maintain oligotrophic status in lake near intake area.

Pathogens

- Regulatory: Arkansas Water Quality Standards and narrative criteria from “Rules and Regulations Pertaining to Public Water Systems.”
- Targets: Meet water quality standards in lake at all times. Minimize risk from *Giardia* and *Cryptosporidium* at water intake based on transport times and delivery efficiency to intake.

Sediment

- Regulatory: Arkansas Water Quality Standards for turbidity in streams and lakes.
- Target: maintain current level of lake water clarity. Establish sediment loading rate caps that support tributary ecological health and long-term preservation of reservoir storage capacity.

Other Potential Impacts or Threats

- Cost of development.
- Land use restrictions.
- CAW rate increases.
- Impacts on watershed views.
- Invasive species.

These other potential impacts or threats are not directly amenable to prediction with a water quality model. There are no minimum levels established in regulation and quantitative numeric targets proposed. Tetra Tech will compare the relative impact across management scenarios to provide a qualitative basis for evaluation of preferences. Note that the impacts on watershed views will only be evaluated subject to further Council deliberation.

Discussion

Mr. Nestrud asked what the specific target is to protect public health and to protect against taste, odor, and color problems. Dr. Butcher said that the target would be to maintain an oligotrophic status. Currently, the lake is borderline oligotrophic (no problematic blooms) and mesotrophic (algal productivity that increase risk of problem blooms).

Ms. Bell asked if anything could be done to improve water quality. Dr. Butcher said where there are current land uses and practices that are causing problems, we can recommend new practices or requirements. For example, we will look at existing sediment loading to the lake, existing practices for managing sediment loadings, and opportunities to improve practices.

Mr. Texter asked if there are any models envisioned for use that will evaluate natural degradation of the lake. If there is no additional development, what would be the rate or progress of natural eutrophication? Dr. Butcher said that, without having done the analysis, he thinks it is likely that the lake is deep enough to go many years without any natural degradation. He would have to do the analysis to have a more definitive answer but is not sure that it is within the scope of work.

Mr. Loveless asked about the need for CAW to invest in another raw water source to meet the long-term needs of the region. Mr. Kirsch of CAW said that he could supply that information to Mr. Loveless. Ms. Althoff also asked for a copy of the study. [Mr. Kirsch subsequently supplied a copy to both of these Council members.]

Mr. Dicker said that he would like to go beyond the minimum state requirements, because such targets mean that CAW is just complying with regulations (going over the threshold means noncompliance with the minimum standards) and that CAW would not be maintaining a high quality drinking water supply as stated in the goal if only the minimum standards were applied. Dr. Butcher said that setting higher targets and using the regulations as the minimum threshold is the direction of the proposed targets.

Conditional Endorsement of Targets

Trevor Clements of Tetra Tech asked the group to indicate if they endorse the proposed targets and if members like the direction of the targets. Members said they endorse the targets; however, Mr. Nestrud said he generally supported the targets but needed more information about the specific numeric targets needed to meet the public health and taste and odor objectives. Tetra Tech said the information would be provided at the next meeting.

Discussion of Upcoming Tasks

Mr. Trevor Clements discussed upcoming tasks including development of the Quality Assurance Project plan, setting up, calibrating, and validating watershed and lake models, and the baseline assessment (comparing existing conditions to projected buildout conditions under existing regulations and policies). For the latter task, Tetra Tech will work with local planners, regulatory agencies, and others to develop assumptions for baseline buildout scenarios. There will likely be two scenarios projecting two patterns of development: one based on use of package wastewater treatment plants, which would allow a higher density, and one where development depends on onsite septic systems. The models will predict lake conditions under buildout of the watershed under both scenarios. Mr. Loveless suggested that Tetra Tech talk with local developers about the current demand or pattern of development to develop the assumptions. Mr. Clements said we would do that to the extent that time and resources allow.

Developing Menu of Management Options

Another upcoming task is developing a menu of the most promising management options to draw from. This will enable Tetra Tech and the Policy Advisory Council to develop alternative management scenarios (or combinations of different management options). We will carry forward the most promising options based on technical, political, and administrative feasibility, as well as potential cost to the development community. Mr. Clements asked the group:

- What questions would you like to see answered regarding potential management options?
- Are there specific management options that you would like to see more information on?

Following is the group's response.

- Design guidelines.
- Location of development within the watershed.
- Forest fire response and impacts.
- Other watershed protection ordinances and common themes. How long has the ordinance been effective?
- Housekeeping practices by property owners (septic tanks, pets, fertilizers). Techniques, track record, and compliance.
- Site performance standards for new development and a site evaluation tool to enforce them.
- Allowable loads and how they are allocated. Who enforces and regulates the loads?
- Fundamentals of management options, including stormwater options and wastewater package plants.
- Are there options for making water quality better (looking at existing watershed activities and the lake operations)?

- Low impact development on steep slopes.

Deltic Timber Submitted the following best management practices for consideration/evaluation:

- Nonstructural
 - Preservation of vegetative cover.
 - Establishment of vegetative cover.
 - Limits on imperviousness.
 - Buffer zones around lakes, streams, and sinkholes.
 - Restrictions on pollutant use in geographic area (e.g., fertilizer).
 - Maintenance (e.g., street sweeping).
- Structural
 - Biofilters (grass strips, swales, wetland swales).
 - Detention.
 - Extended detention.
 - Media filters.
 - Infiltration trench or basin.
 - Porous pavement.
 - Bioretention basins.
 - Open water wetland.
 - Meadow wetland.
 - Channel with wetland bed.
 - Forebay and afterbay.
 - Proprietary manufactured treatment systems.
- Conservation site design.

Mr. Clements said that over the next several meetings, Tetra Tech would be bringing information about different management techniques.

Other Items

Mr. Nestrud said that he had confirmed with Tetra Tech that he is representing Deltic Timber and not all landowners in the watershed. He said that he received a listing of 800 landowners and thinks it would be good to involve them more. Currently, there are three landowner representatives on the Policy Advisory Council: an individual landowner, Deltic Timber, and the US Forest Service. Ms. Brewer said that Tetra Tech is recommending having meetings with watershed residents and landowners several times during development of the management plan to keep them informed and get feedback. A letter will be sent to landowners soon about the project and to let them know how they can be involved.

Mr. Wilburn was not able to attend but asked that a letter from him be distributed to Council members. The letter expressed concerns about the watershed landowner participation and the ground rule for settling disagreement among Council members when steps for reaching

consensus have been exhausted. Mr. Clements said Tetra Tech would review the letter with CAW and respond to Mr. Wilburn.

The next meeting date was set for December 8. Beginning in January, Council meetings will be scheduled for the third Thursday of each month. In the event a meeting is not needed, it will be canceled for that month.

Attachment A

Lake Maumelle Policy Advisory Council Meeting Sign-In Meeting Date: October 20, 2005

| Present | Member Name | Designation | Representing |
|-----------|---------------------------|----------------|---|
| P | Herb Dicker | PRIMARY | Ratepayers (Little Rock Neighborhoods) |
| P | Kathy Wells | Alternate | Ratepayers (Little Rock Neighborhoods) |
| P | Sue Corker | PRIMARY | Ratepayers (North Little Rock Neighborhoods) |
| NP | Jack Finnegan | Alternate | Ratepayers (North Little Rock Neighborhoods) |
| P | Mike Simpson | PRIMARY | Ratepayers – Jacksonville Water Works (Master-Metered Customers) |
| P | Robert Stout | Alternate | Ratepayers – North Pulaski Water Works (Master-Metered Customers) |
| P | Jane Dickey | PRIMARY | Central Arkansas Water Commission (Member) |
| NP | Tony Kendall | Alternate | Central Arkansas Water Commission (Vice Chair) |
| P | Ruth Bell | PRIMARY | Community (League of Women Voters of Pulaski County) |
| P | Kathleen Oleson | Alternate | Community (League of Women Voters of Pulaski County) |
| P | Steve Owen | PRIMARY | Community (North Little Rock Chamber of Commerce) |
| NP | Randy Wilbourn | PRIMARY | Community (Little Rock Regional Chamber of Commerce) |
| P | Kate Althoff | PRIMARY | Community (Citizens Protecting Maumelle Watershed) |
| P | Barry Haas | Alternate | Community (Citizens Protecting Maumelle Watershed) |
| NP | Justice Bill Gipson | PRIMARY | Elected Official (Perry County Quorum Court) |
| P | Justice Pat Dicker | PRIMARY | Elected Official (Pulaski County Quorum Court) |
| P | Alderman Neil Bryant | PRIMARY | Elected Official (North Little Rock City Council) |
| P | Vice Mayor Barbara Graves | PRIMARY | Elected Official (Little Rock Board of Directors) |
| NP | Glen Hooks | PRIMARY | Environmental (Sierra Club) |
| P | Dale Ingram | Alternate | Environmental (Sierra Club) |
| P | Kevin Pierson | PRIMARY | Environmental (Audubon Arkansas) |
| P | Stephanie Hymel | Alternate | Environmental (Audubon Arkansas) |
| P | Charles Nestrud | PRIMARY | Property Owners (Deltic Timber Corporation) |

| Present | Member Name | Designation | Representing |
|----------------|--------------------|--------------------|---|
| P | Alan Newman | PRIMARY | Property Owners (U.S. Forest Service) |
| P | Larry Hedrick | Alternate | Property Owners (U.S. Forest Service) |
| P | Ken Texter | PRIMARY | Property Owners – Thornburg Water Association (Water Association within Watershed/Property Owner) |
| P | Wally Loveless | PRIMARY | Realtors (Member of Arkansas Realtors Association) |
| P | Kenneth Gill | Alternate | Realtors (Coldwell Banker Advantage) |
| P | John Bryant | PRIMARY | Recreationists (Grand Maumelle Sailing Club) |
| P | Nicole Claas | Alternate | Recreationists (Grand Maumelle Sailing Club) |
| P | Randy Day | PRIMARY | Recreationists – Fishermen (President of Maumelle Bass Club) |

OTHERS

| Name | Representing |
|------------------|---|
| Alan Clingenpeel | U.S. Forest Service (TAC Member) |
| Walter Malone | Little Rock Department of Planning & Development (TAC Member) |
| Bruno Kirsch | Central Arkansas Water (TAC Member) |
| Roger Miller | Arkansas Department of Health and Human Services (TAC Member) |
| Marie Crawford | Central Arkansas Water |
| Shani Canada | Central Arkansas Water |
| Kimberly Brewer | Tetra Tech, Inc. |
| Jon Butcher | Tetra Tech, Inc. |
| Trevor Clements | Tetra Tech, Inc. |
| Hugh Pollard | Brooks-Pollard Company |
| Byron Hicks | McClelland Engineering |
| Jim Harvey | Central Arkansas Water |

Draft Goals and Objectives

Endorsed 10/20/05 by the Policy Advisory Council

OVERARCHING GOALS OF THE WATERSHED MANAGEMENT PLAN

- Maintain long-term, abundant supply of high quality drinking water for present needs and continuing growth of the community.
- Provide an equitable sharing of costs and benefits for protecting Lake Maumelle.

OBJECTIVES

(Note: it will be assumed that only management options that comply with environmental regulations, such as water quality standards, will be considered.)

Minimize risks to public health from: **(most important)**

- toxic spills
- pesticide/herbicide runoff
- bacteria/pathogens from failing septic/community systems and animal wastes
- toxins from blue-green algae

Minimize impacts on watershed property owners and residents including: **(most/more important)**

- use restrictions
- cost of BMPs

Minimize water supply taste, odor, and color problems associated with: **(more important)**

- algae
- iron and manganese
- turbidity

Minimize impact on the water supply intake and water treatment facility operations such as: **(more important)**

- intake/filter clogging
- excess chemical additive requirements
- increased operation and maintenance (O&M)

Minimize rate increases from: (more important)

- increased treatment cost
- increased O&M
- land acquisition/buffer easements

Minimize loss of reservoir water supply storage capacity from sedimentation. (important)

Minimize risk of impairment to tributary streams in the watershed for stream and lake protection from: (important)

- channel instability (erosion, sedimentation, scour)
- pollution from runoff (sediment, nutrients, pesticides/herbicides, pathogens)

Allow limited recreation that reflects environmentally sound stewardship of the lake for: (important)

- fishing
- sailing
- boating
- access (picnicking, hiking, visiting)

Meet other community values including: (important)

- Be economically competitive
- Provide a strong tax base for communities in the region and minimize tax increases
- Be administratively feasible