# Technical Memorandum No.6

Date: October 8, 2008

To: Madison Metropolitan Sewerage District

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Subject: 50-Year Master Plan
**TM-6: Scenario Planning Workshops (Final)**

Project No.: MMSD No. 8425001
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## 1. Purpose

This memorandum documents the two scenario planning workshops held with key MMSD staff on June 5, 2008 and the Technical Advisory Committee (TAC) on June 6, 2008. The workshops used a scenario planning process to identify factors and uncertainties that could potentially impact the District during the 50 year master planning period, with a focus on the far end of the planning period. Information gained through this process will help the District continue to provide high quality services throughout the 50 year planning period.

## 2. Scenario Planning Description

Scenario planning is a predictive modeling technique used for risk analysis and planning policy creation. Scenario planning identifies probable outcomes that may result from a combination of factors/planning variables and their associated uncertainties. One of the greatest values of scenario planning lies in its articulation of a common future view to enable coordinated decision-making and action. Though scenario planning does not predict the future, it enables the user to prepare for future outcomes and to identify actions that need to occur to achieve desired outcomes.

The technique grew out of defense planning in the 60's and 70's and was a key element in the successful positioning of Royal Dutch Shell after the Arab oil embargo of the early 70's. Scenario planning has since been successfully used in both the public and private sectors to create situation-specific "alternative futures" while

systematically accounting for future uncertainty. Scenario planning typically includes the following steps:

1. Frame the core planning questions

   The central questions or issues that will be addressed are identified through a brainstorming session with the planning group. The planning group then discusses the various issues and arrives at consensus agreement on the central issue(s) that needs to be addressed.

2. Identify driving forces

   A second brainstorming session is held to generate a list of driving forces that have a bearing on the central questions. The goal at this stage is to initially capture all ideas without trying to gauge their relative importance. Many of the driving forces relevant to the MMSD master planning process were identified in the Planning Variable Identification Workshop, held on May 19, 2008, while others became evident in discussions held during the scenario planning workshops.

3. Identify critical uncertainties

   Once the driving forces have been identified, the planning group evaluates each driving force based on two factors: 1) importance relative to the central issue(s); and 2) the associated level of uncertainty. The driving forces of greatest interest are those that are both very important and highly uncertain.

4. Develop scenarios

   Two critical driving forces are used to create a matrix of possible scenarios. This is accomplished by identifying the polar extremes of each critical driving force. The uncertainties of those driving forces are not viewed as representing a range or spectrum of relative values. They are instead viewed as end-point extremes. The critical uncertainties are then used to create two-dimensional matrices. The quadrants defined by the combinations of the critical uncertainties are the possible future scenarios to be evaluated.

5. Map paths to each scenario

   Each characterized scenario is a future scenario that could occur. The planning group plots a pathway to each of these scenarios based upon its specific characteristics and issues. The pathway includes individual elements such as public, political, and research/technological programs as well as

various construction projects that need to be sequenced over time to achieve the envisioned future scenario.

6. Identify common elements

   The pathways are developed independently from one another and are based solely on realizing each specific scenario. Nonetheless, similarities and overlaps do occur among the individual pathways developed. There are projects and programs that are present on all or many of the individual scenario pathways. This commonality indicates that such projects and programs will be useful under a wide range of possible futures. As a result, such elements are more likely to be viable as the future unfolds.

7. Screen & align alternatives

   In this step, alternatives associated with each scenario pathway are identified. Rating criteria will be generated and used in ranking these alternatives.

8. Develop signposts & triggers and implementation plan

   In this step, signposts and trigger mechanisms along the scenario pathways are generated. The implementation plan for the planning period is also developed.

# 3. Scenario Planning Workshops

## A) General

The workshops began with an introduction to scenario planning techniques. This was followed by a presentation on factors and/or trends that are currently impacting the wastewater industry. These include:

1. Population growth

   The population of the U.S. is projected to grow by 28.9% from 282,125,000 to 363,584,000 from Year 2000 to Year 2030. The Dane County and the City of Madison populations are projected to expand by 36.0% and 27.3% respectively during the same period. Population census shows that people are now living 20 years longer than in 1970s', which implicates delayed retirement, more age-diverse workforce, and potential skills shortages.

2. Political climate

   Political climate is getting more complex with the surge of NGO advocacy, rise of weblogs, larger role of public participation, etc. It implicates the needs to manage constituencies, develop relationships, understand where the public stands on issues, improve financial and capital improvement project transparency, etc.

3. Environmental concerns

   With increasing concerns on global climate change, the evaluation of greenhouse gas emissions and carbon footprints of wastewater treatment facilities may become regulated in the future.

4. Increasingly stringent environmental regulations

   With increasing public concerns on water resource protection, more contaminants may be regulated by regulatory agencies in the future. Wastewater effluent discharge limits may become more stringent.

5. Financial constraints

   Existing infrastructure replacement and repair, energy volatility, less available federal subsidies, and resistance for raising wastewater rates will create financial constraints to the wastewater treatment agencies. It raises the needs for communicating to stakeholders, optimizing utility efficiency, documenting infrastructure/rate needs, etc.

6. Total water management

   Total water management requires considering entire water cycle as an integrated system. The current challenges include degradation of water resources, farm land loss, etc. The strategies include wastewater facility life cycle analysis, watershed/stakeholder engagement, promoting using stormwater/wastewater as resource, water supply diversification, water conservation, environmental trade-offs, etc.

7. Customer service

   The wastewater agencies will be more proactively in educating the water customers, understanding the needs and expectations of costumers, and cultivating sustainable approaches in utilizing water resource.

8. Changes in the workforce

   The U.S. workforce is getting older, multi-generational, more female and ethnically diverse. Professions in environmental engineering field are becoming more popular, information technology skills become more necessary for qualified workers. It implicates that future wastewater jobs should be able to accommodate workforce with generational differences, provide flexibility for workforce, emphasize training and apprenticeship programs, and accommodate part-time retirees.

9. Technology

   The current trends for technologies are smaller, cheaper, faster and more mobile. Automation and remote monitoring are the trends for future wastewater treatment facilities.

10. Energy

    Energy pressure may create incentives for implications of more energy-efficient treatment facilities to lower costs and interruption risk. Sustainable energy such as solar power and wind power will play bigger role in future energy market and wastewater water facilities.

11. Increasing risk

    Risks to wastewater utility are increasing due to IT and physical security issues, climate change, workforce shortage, litigation, etc. The strategies include reassessing system vulnerability to attack (physical and IT), developing specific risk management strategies for climate change, succession planning, and public outreach in the event of a terrorist attack.

A list of planning variables/driving forces identified by the consultants, MMSD staff and TAC members was then reviewed, with additional variables identified during the group discussion. Workshop attendees then ranked the variables based on level of uncertainty and importance. Top-ranked variables/driving forces were then used to generate scenario matrices, which served as the basis for identifying scenario implications.

## B) Ranking of Planning Variables and Driving Forces

The following 24 planning variables and driving forces were identified and discussed by the attendees of the two workshops. The first nine variables were identified and discussed in TM 4, Planning Variables. The remaining variables were added during this workshop.

1. Location of Treatment Plant
2. Biosolids Management
3. Effluent Discharge and Reuse
4. Regulatory Trends
5. Storm Water Management
6. Environmental Impacts
7. Future Flow/Load Projections
8. Construction/Operational Costs
9. Public Acceptance
10. Workforce
11. Energy
12. Commodities
13. Water Rights
14. Competitiveness
15. Other WWTPs
16. New Technologies/Solutions
17. Population Shift
18. Ability/Willingness to Pay by Customers
19. Protect the Lakes
20. Area Growth and Distribution
21. Cost of Repair/Replacement of Existing Facilities
22. Change in Leadership/Governance
23. Total Watershed Management
24. Special Water Needs by New Industries

These variables and driving forces were ranked for their levels of uncertainty and importance by workshop attendees according to the following scale:

| **Level of Uncertainty: 1-5** | **Level of Importance: 1-5** |
|---|---|
| Very Certain – 1 | Very Important – 5 |
| Certain – 2 | Important – 4 |
| Somewhat Certain -3 | Less Important – 3 |
| Uncertain – 4 | Partially Important – 2 |
| Very Uncertain – 5 | Not Important – 1 |

The variables ranking results for both workshops are presented in Figures 3-1 and 3-2. The variables that have the highest level of importance and uncertainty are highlighted in yellow boxes.

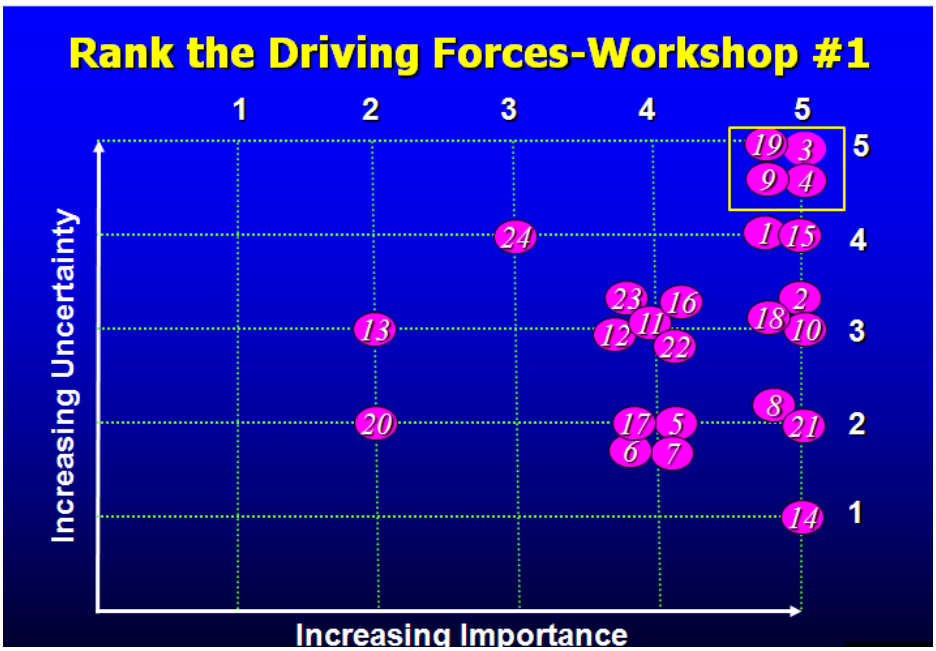


**Figure 3-1. Ranking of Importance and Uncertainty of Planning Variables – Workshop #1**

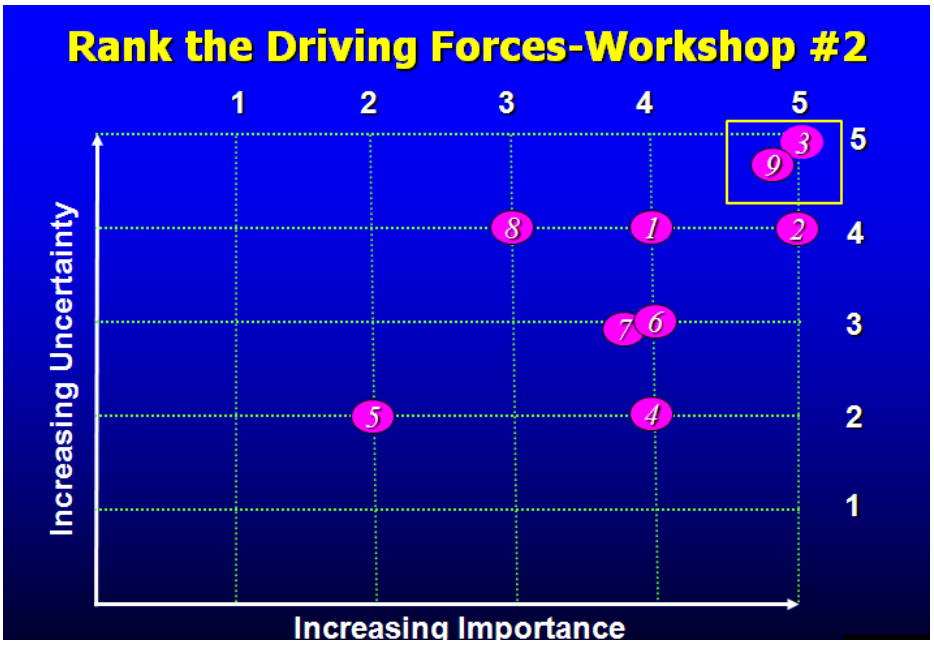


**Figure 3-2. Ranking of Importance and Uncertainty of Planning Variables – Workshop #2**

Although two groups of workshop attendees ranked each variable slightly differently, the following variables and driving forces were selected by both groups for the highest level of uncertainty and importance:

1. No. 3 - Effluent Discharge and Reuse

   Currently MMSD pumps plant effluent to Badger Mill Creek via a 10 mile force main and to Badfish Creek via a 5 mile force main. Peak flows exceeding the plant's pumping and equalization capacities overflow to Nine Springs Creek. Increasing regulatory and operational pressures, including the potential for more stringent effluent limits, high energy requirements for pumping, concerns on mitigation of inter-basin water transfers, ground water preservation, etc. could impact future practices. Many of the future options will require the involvement of other water resource managers, such as the Capital Area Regional Planning Commission, the Wisconsin Department of Natural Resources, the Dane County Lakes and Watershed Commission and local drinking water and storm water utilities. Local involvement of special interest groups such as watershed advocacy groups, fishermen, conservation organizations, environmental organizations, along with the general public, will be necessary to implement future reuse options and alternate discharge locations.

2. No. 4 - Regulatory

   Future regulatory requirements could significantly impact MMSD's planning and operations over the planning period. Areas of particular importance include: phosphorus criteria; total nitrogen criteria; chlorides, mercury and other toxics, thermal standards, microconstituents in effluent and biosolids; water quality assessments; Rock River TMDL development; water balance issues, groundwater rules for discharges to land and subsurface, and requirements for land application of biosolids.

3. No. 9 - Public Acceptance

   Public acceptance will play an important role as the District evaluates effluent reuse opportunities; construction of regional treatment plants; construction of un-manned neighborhood treatment plants; and alternative biosolids management options.

4. No. 19 - Protect the Lakes

   Madison's lakes are the most visible and highly regarded resource of the local ecological system. Therefore, protecting the lakes is one of the top concerns in the master planning process.

## 4. Development of Scenarios

Based upon the selected planning variables and driving forces, three scenario matrices were developed in the two workshops for group discussions (Figures 4-1, 4-2, and 4-3). The variable "No. 19 - Protect the Lakes" is dependent on the effluent discharge locations, biosolids management alternatives and other planning variables, therefore was not used as an independent planning variable in the scenario matrices. Workshop attendees discussed each of these scenario matrices.

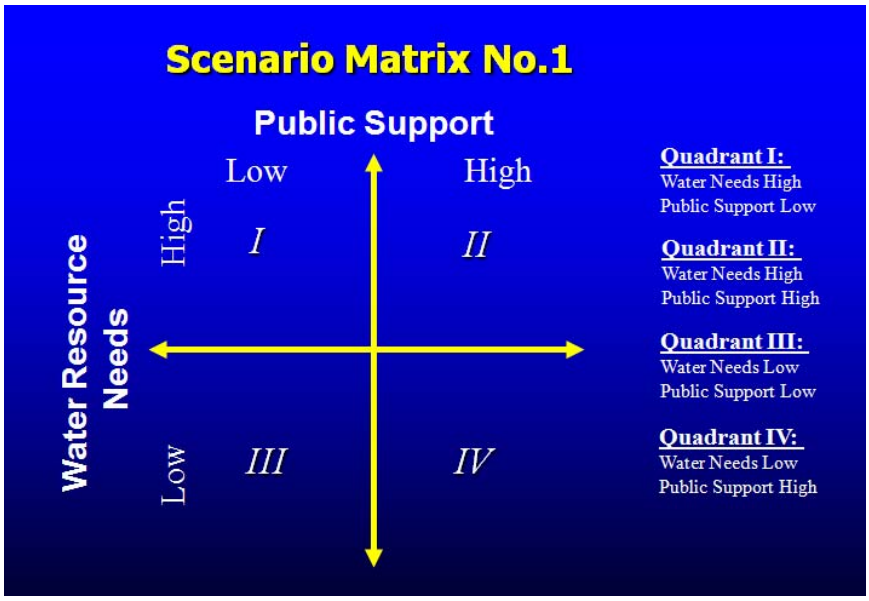


**Figure 4-1. Scenario Matrix No. 1**

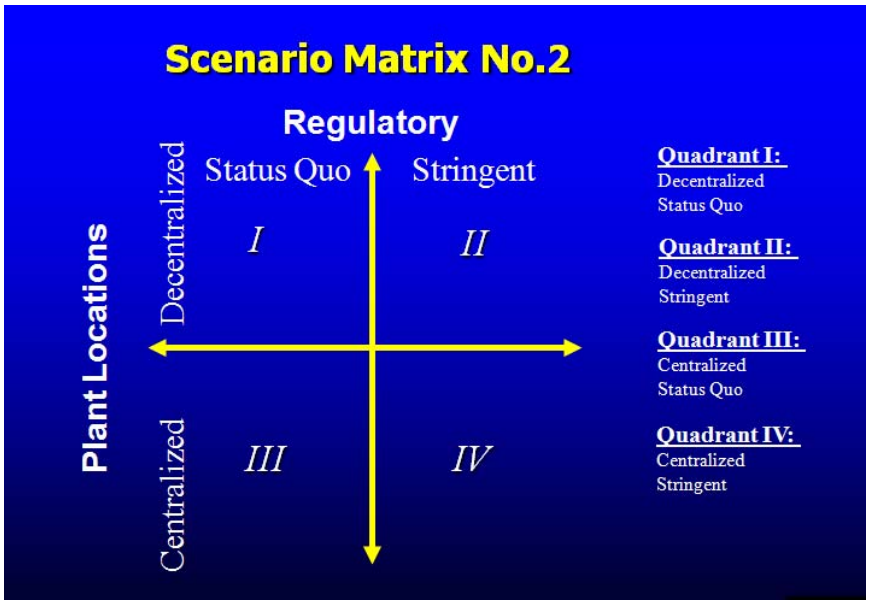


**Figure 4-2. Scenario Matrix No. 2**

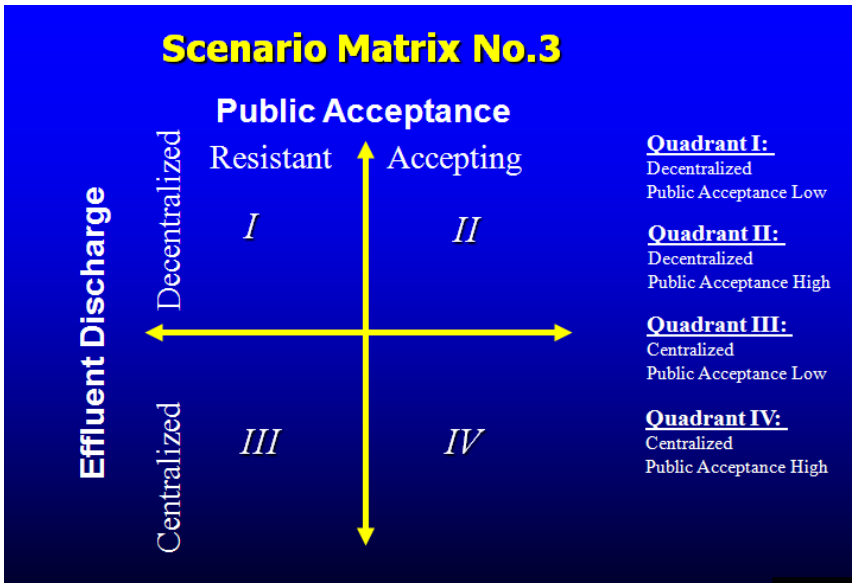


**Figure 4-3. Scenario Matrix No. 3**

## 5. Planning Scenario Implications

The following implications were identified by the workshop attendees for different planning scenarios:

### A) Water Resource Needs High and Public Support Low

- Due to the low public support, it will be necessary to target potential customers for recycled effluent.
- Management of the District's effluent discharges and effluent reuse alternatives will need to be adaptive due to low public support.
- Groundwater recharge could be a viable option.
- Incremental implementation of effluent reuse alternatives will be necessary to gain public acceptance.
- It will be important to identify the lead agency for overall water resources management in the District's service area.
- It will be important to develop good relationships with the other water sector agencies, such as the Capital Area Regional Planning Commission, the Dane County Lakes and Watershed Commission, the Wisconsin DNR, and the local water and storm water utilities.
- It will be important to develop a good public education program related to reuse.
- It will be important to monitor the developments in the technical fields associated with water reuse.
- The District should identify the target environmental groups that would have an interest in water reuse and engage these groups in the water resource management discussions.

- It will be important to develop a good public relations program to better understand the information needs of the public and develop consensus/support for goals and major program elements.
- The construction of demonstration facilities to determine costs and show benefits of effluent reuse alternatives may be effective under this scenario.
- More efforts will be needed to convince the public and regulatory agencies that effluent reuse alternatives are protective of the public health and the environment.
- The District will need to establish its credibility in implementing effluent reuse alternatives.

### B) Water Resource Needs High and Public Support High

- Under this scenario the District can be more selective in which reuse alternatives are implemented since infrastructure costs associated with water reuse can be high and the energy consumption for some alternatives can be high.
- Training and skills development for the new process operating procedures will be needed in implementing effluent discharge and reuse alternatives.
- Additional land may need to be purchased to accommodate additional treatment and conveyance facilities.
- A list of potential customers for recycled water will need to be developed and users identified that have needs for large volumes of recycled water.
- Seasonal water demand needs to be addressed when considering effluent reuse alternatives such as golf course or crop irrigation.
- Contingency plans will need to be provided in the effluent reuse systems to address changes in demands for reclaimed water.
- Public education will still be important under this scenario.
- Water conservation efforts may result in reduced demand for reclaimed water.
- The District will need to establish its credibility in implementing effluent reuse alternatives.

### C) Water Resource Needs Low and Public Support Low

- The need for effluent reuse will require justification.
- Public education to cultivate public acceptance for new effluent discharge locations and reuse alternatives will be necessary.
- If water reuse needs are low, it will be more important to promote water conservation efforts to avoid the need for increasing the capacity of the current effluent conveyance system.
- It will be important to monitor regulatory trends and their impacts on the effluent discharge and reuse alternatives.
- The construction of demonstration facilities to determine costs and show benefits of effluent reuse alternatives will be necessary under this scenario.

- This quadrant best represents the current condition and would require the lowest level of operational changes.

### D) Water Resource Needs Low and Public Support High

- This quadrant represents the best scenario for the District in the near term.
- A good public education program related to wastewater treatment and water reuse will still be important.
- If water reuse needs are low, it will be more important to promote water conservation efforts to avoid the need for increasing the capacity of the current effluent conveyance system.
- The construction of demonstration facilities to determine costs and show benefits of effluent reuse alternatives will be desirable under this scenario.
- With a higher level of public support, the promotion of green communities may be an effective approach to promoting water reuse.
- It will be important to monitor regulatory trends and their impacts on the effluent discharge and reuse alternatives.

### E) Decentralized Treatment and Regulatory Status Quo

<u>For Constructing New Satellite Plants</u>

- The public may be more resistant to the satellite wastewater treatment facilities in their neighborhood if regulations are not felt to be stringent enough.
- Additional staff will be needed to operate the satellite plants. With changing demographics, developing a work force for the satellite plants may be difficult.
- Operation and maintenance of the overall sewerage system will be more complex. Additional redundancy will be needed.
- Lands will be required for satellite treatment plants.
- Higher levels of treatment than currently provided at the Nine Springs plant may be required at new satellite plants.
- Biosolids treatment and disposal operations will be more complex.

<u>For Rehabilitating and Expanding Existing Plants in Nearby Municipalities</u>

- Reaching service agreements with the nearby municipalities could be challenging.
- Initial costs could be high compared to the centralized treatment model.
- Politics (issues not directly related to the provision of sewerage service) may impact the ability to implement projects with nearby municipalities.
- The issue of ownership and control of the treatment plants may be a challenge.
- There may be major construction cost savings under this scenario.

## F) Decentralized Treatment and Regulatory Stringent

For Constructing New Satellite Plants

- Higher levels of treatment than currently provided at the Nine Springs plant may be required at new satellite plants, especially if more stringent requirements are in place.
- Need to identify potential industrial customers of effluent reuse.
- The construction of satellite plants would reduce the needs for modifications at the Nine Springs WWTP and in the existing conveyance system.
- Construction costs may be high compared to the centralized treatment model, especially if more stringent requirements result in the construction of additional treatment processes.
- Although the public may still resist locating a satellite treatment plant in their neighborhood, they may be more receptive if regulations are felt to be stringent enough.
- Additional staff will be needed to operate the satellite plants. With changing demographics, developing a work force for the satellite plants may be difficult, especially if more stringent requirements result in the use of newer and more complex technology.
- It may be difficult to obtain ownership of suitable sites for satellite plants, especially if more stringent requirements result in the construction of additional treatment processes that require larger tracts of land.
- Biosolids treatment and disposal operations will be more complex, especially if more stringent requirements result in the construction of additional treatment processes.

For Rehabilitating and Expanding Existing Plants in Nearby Municipalities

- The determination of service charge rates could be challenging.
- Biosolids treatment and disposal operations could be more complex, especially if more stringent requirements result in the construction of additional treatment processes.

## G) Centralized Treatment and Regulatory Status Quo

- Available lands in the proximity of the Nine Springs WWTP could be a constraint to the plant expansion.
- Effluent volumes and loadings to Badfish Creek and Badger Mill Creek could be an issue if the plant keeps expanding.
- New infrastructure at Nine Springs will be needed sooner than if flow diversion to satellite facilities or to other existing treatment plants is implemented. This includes new effluent conveyance facilities.
- Lower capital costs can be achieved due to the economy of scale.
- There is a potential for higher pumping costs than if flow was diverted to satellite plants or to other existing treatment plants.

- The older technology used at Nine Springs may result in higher energy consumption.

### H) Centralized Treatment and Regulatory Stringent

- Multiple options for high quality effluent discharge and water reuse become possible.
- There is a potential to discharge to the lakes.
- Use of newer technologies may lower manpower requirements.
- A higher quality effluent that could be returned to Lake Waubesa would reduce or eliminate the need for effluent pumping. This would also simplify operation and maintenance.
- This scenario would result in centralized biosolids treatment and disposal facilities.
- Available lands in the proximity of the Nine Springs WWTP could be a constraint to the plant expansion, especially if more stringent requirements result in the need to construct additional treatment processes.
- Meeting stringent effluent limits can be challenging.
- New infrastructure at Nine Springs will be needed sooner than if flow diversion to satellite facilities or to other existing treatment plants is implemented. This includes new effluent conveyance facilities.
- The capacity of the current interceptors and pumping stations will need to be increased sooner than if flows were diverted to new satellite treatment plants or to other existing treatment plants.
- Effluent volumes to Badfish Creek and Badger Mill Creek could be an issue if the plant keeps expanding. However, with more stringent regulations, pollutant loadings may be less of a concern.

### I) New Effluent Discharge/Reuse Locations and Resistant Public

- Educate the public and the other water sector agencies, including the regulators, to cultivate acceptance of new effluent discharge locations and reuse alternatives (Social marketing).
- Costs for all effluent discharge and reuse alternatives will need to be developed.
- It will be important to achieve win-win situations among multiple parties.
- The construction of demonstration facilities to determine costs and show benefits of effluent reuse alternatives will be necessary under this scenario.
- The District will need to develop effective partnerships in implementing effluent discharge and reuse alternatives.
- Due to public resistance, it will be necessary to target potential customers for recycled effluent.

### J) New Effluent Discharge/Reuse Locations and Accepting Public

- Under this scenario the District can rely more on cost-effectiveness in locating new discharge locations and choosing which reuse alternatives to implement, rather than implementing the alternatives that have the least public resistance.
- When water becomes more valuable, the public will be more willing to accept effluent reuse. The demand for effluent reuse may be high.
- It will be important to establish and maintain the District's credibility in implementing water reuse alternatives to gain and keep public acceptance
- The demand for effluent reuse may be high.

### K) Current Effluent Discharge Locations and Resistant Public

- If current effluent discharge locations are to be maintained and water reuse needs are low, it will be more important to promote water conservation efforts to avoid the need for increasing the capacity of the current effluent conveyance system.
- The capacity and capabilities of the current treatment and conveyance systems will need to be expanded earlier.
- Educate the public and the other water sector agencies, including the regulators, to cultivate acceptance of reuse alternatives (Social marketing).
- It will be important to establish the District's credibility in implementing water reuse alternatives to gain public acceptance.

### L) Current Effluent Discharge Locations and Accepting Public

- Under this scenario the District can rely more on cost-effectiveness in selecting which reuse alternatives to implement, rather than implementing the alternatives that have the least public resistance.
- It will be important to establish and maintain the District's credibility in implementing water reuse alternatives to gain and keep public acceptance
- Although less important than in Quadrant 3, it will still be necessary to promote water conservation efforts.
- Although less critical than in Quadrant 3, the capacity and capabilities of the current treatment and conveyance systems will need to be expanded earlier.
- Effluent volumes and loadings to Badfish Creek and Badger Mill Creek could be an issue if the plant keeps expanding. It will be important to track new regulatory initiatives that could impact effluent quantity and quality levels for Badfish Creek and Badger Mill Creek.

# 6. Future Signposts and Triggers

Based on the results of the two workshops, signposts and trigger mechanisms were generated to provide MMSD the necessary "early warning" for preparing for future scenarios. The signposts and potential corresponding strategies are presented in Table 6-1.

**Table 6-1 Signposts for Future Scenarios**

| No. | Signposts | Potential Strategies |
|---|---|---|
| 1 | Improvement in wastewater treatment technology for high quality effluent processes | • Discharge to Lake Waubesa, which would reduce effluent pumping costs and simplify operation and maintenance.<br>• Discharge to Yahara River upstream of Lake Mendota to provide additional base flow<br>• Increase effluent discharge to Sugar River to match the groundwater withdrawal from the watershed. |
| 2 | Local regional wastewater agencies show interest in joining MMSD. This could happen in the following scenarios:<br>• More stringent future regulatory requirements make the small-scale local operations less cost-effective<br>• Local agencies have financial or technical difficulties in meeting the higher discharge limits<br>• The imbalanced inter-basin water transfer becomes a major concern and requires a regional solution and there is a consensus that MMSD is the appropriate agency to deal with the issue. | • Consider forming partnership with regional wastewater agencies<br>• Determination of the provision of sewerage service structure and service charge rates<br>• Negotiate to achieve win-win situations among multiple parties. |
| 3 | Imbalanced inter-basin water transfer becomes a major concern in the future | • A new Sugar River plant discharge to the confluence of the Sugar River and the Badger Mill Creek or/and headwater of the Sugar River will become more convincing.<br>• Consider starting planning process for a Mendota Plant to provide additional base flow in the Yahara River upstream of Lake Mendota.<br>• Increase effluent discharge to Starkweather Creek by constructing a new satellite treatment plant or conveying treated effluent from NSWTP to the area.<br>• Expand the existing Sun Prairie WWTP and increase discharge to Koshkonong Creek. |
| 4 | Low public support for effluent reuse | • Target potential industrial effluent users.<br>• Manage effluent discharges and reuse, be adaptive to different future scenarios.<br>• Establish credibility with incremental implementation of effluent reuse alternatives<br>• Identify the lead agency for overall water resources management in the area. Develop good relationships with other water sector |

| No. | Signposts | Potential Strategies |
|---|---|---|
| | | agencies<br>• Develop good public education program related to effluent reuse to convince the public and regulatory agencies that effluent reuse alternatives are protective for the public health and the environment.<br>• Monitor the developments in the technical fields associated with effluent reuse<br>• Identify the target environmental groups that would have an interest in water reuse and engage these groups in the water resource management discussions.<br>• Construction of demonstration facilities to show benefits of effluent reuse alternatives and to determine capital and M/O costs. |
| 5 | High public support for effluent reuse | • Be selective in which alternatives to be implemented and to adopt the alternatives with high cost efficiency and environmental benefits.<br>• Conduct training and prepare workforce for effluent reuse applications.<br>• Purchase land for additional treatment and conveyance facilities.<br>• Develop lists of potential customers for effluent reuse.<br>• Address the seasonal demand variance for treated effluent. Provide contingency plans for effluent reuse systems. |
| 6 | Higher than projected peak flows due to increased precipitation and resulting higher rates of I/I and high groundwater levels | • Harden the conveyance system components to eliminate points of entrance for I/I.<br>• Encourage sound management of collection systems in satellite communities<br>• Increase the capacity of new and rehabilitated conveyance system components. |
| 7 | Water resource needs low due to:<br>• Water conservation efforts<br>• Lower than expected growth rate | • Delay construction of additional capacity for the conveyance system and treatment facilities.<br>• Public education to cultivate public acceptance for new effluent discharge locations and reuse alternatives.<br>• Monitor regulatory trends and their impacts on the effluent discharge and reuse alternatives.<br>• Construction of demonstration facilities to determine costs and show benefits of effluent reuse alternatives. |
| 8 | Water resource needs high due to:<br>• Higher than expected growth rate<br>• Population shift | • Public education to cultivate public acceptance for new effluent discharge locations and reuse alternatives.<br>• Construction of demonstration facilities to determine costs and show benefits of effluent reuse alternatives.<br>• Conduct training and prepare workforce for effluent reuse applications.<br>• Purchase land for additional treatment and conveyance facilities.<br>• Develop lists of potential customers for effluent reuse.<br>• Promote water conservation efforts |

| No. | Signposts | Potential Strategies |
|---|---|---|
| | | • Implement programs to reduce inflow/infiltration, which will delay the need for major capital improvement projects required to expand the capacity of the conveyance system. |
| 9 | High regulatory requirements | • Upgrade the existing treatment facilities and effluent pumping system.<br>• Diversify the treated effluent discharge locations and effluent reuse alternatives.<br>• Diversify the biosolids utilization alternatives.<br>• Take proactive action to identify alternative users for biosolids other than agricultural crop land. The production of a Class A biosolids material is critical to assure that a full range of alternate uses can be investigated.<br>• Construction of new satellite treatment plants with high quality effluent processes |