TMDL Implementation Tracking Needs Assessment

Current Status and Future Needs for States in EPA Regions 5, 6, and 10

1.0 EXECUTIVE SUMMARY

The U.S. Environmental Protection Agency (EPA) Region 5 Total Maximum Daily Load (TMDL) Program recently performed an analysis of the new watershed restoration performance measures and potential hurdles to identifying future restoration goals and priorities. The results of the Region 5 analysis revealed the magnitude of the importance of documenting and tracking implementation efforts for TMDLs, so that TMDL Program results can be more accurately reported and predicted.

The Cadmus Group, Inc. (Cadmus), in conjunction with Camp Dresser, & McKee, Inc. (CDM), and Geosyntec Consultants, recently assessed the current status of TMDL implementation tracking in nine different states, including each of the Region 5 states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin), two states in Region 10 (Alaska and Washington), and one state in Region 6 (New Mexico). In addition to assessing the current status of TMDL implementation tracking, the TMDL implementation tracking needs were also determined for each of the nine states. The assessment was completed through a combination of face-to-face meetings with state TMDL, 303(d), and information systems personnel; conference calls, web-based queries, and other forms of information gathering.

The level of tracking performed by the nine states interviewed varies from almost no tracking of implementation information to relatively robust dedicated tracking systems with query and reporting functions and GIS capabilities. Most of the states do not have a dedicated TMDL implementation tracking system in place. However, almost all of the states interviewed see value in developing and implementing a tracking system, with potential benefits ranging from establishing a process and indicators for tracking interim implementation steps to reporting progress on restoration to multiple internal and external stakeholders.

Most states would use a tracking system if developed by EPA, especially those that have not already developed a state-specific system. Some states would consider the availability of a tracking system as an impetus to begin formal TMDL implementation tracking in their state. However, the resources necessary to develop a TMDL implementation tracking system is a concern of most states. States with existing systems capable of tracking implementation information would prefer to continue to develop and utilize their own systems and would hope that any potential future regional or national system (e.g., developed by EPA) would be compatible with existing state systems.

EPA does not have the authority to require states to track TMDL implementation, and this has been acknowledged repeatedly by many individuals at EPA, including Ben Grumbles. The purpose of this assessment was not to prepare for a future impending EPA requirement. Rather, this assessment was undertaken in an effort to be proactive. EPA believes it is important to begin thinking about how best to track the implementation of TMDLs and report on the level of waterbody restoration. From EPA's perspective, it would be better to be proactive and have EPA and the states identify and define the interim measures of success themselves rather than have an external agency dictate the measures of success to them.

2.0 INTRODUCTION

Currently, once a total maximum daily load (TMDL) is approved there is no standardized process for tracking on-the-ground implementation efforts and progress. This severely limits the ability of the U.S. Environmental Protection Agency (EPA) and the states to predict recovery and provide follow-up monitoring, assistance, and support. Nationally, EPA is in the process of developing a TMDL program "pipeline" as an organizational framework for developing, assessing, and interpreting results measures. The pipeline identifies key stages along the TMDL process including listing, planning, implementation, and recovery. Region 5 believes that this process can be enhanced by putting in place, a process that captures the necessary information to allow for the classification of each waterbody with a completed TMDL into categories along the TMDL pipeline.

The EPA Region 5 TMDL Program recently performed an analysis of the new watershed restoration performance measures and potential hurdles to identifying future restoration goals and priorities. EPA has always recognized the value of tracking and categorizing ongoing TMDL implementation efforts. However, the results of the Region 5 analysis revealed the magnitude of the importance of documenting and tracking implementation efforts for TMDLs and the benefits that would ensue from such efforts. For example, tracking implementation efforts would allow for TMDL Program results to be more accurately reported and predicted.

The Cadmus Group, Inc. (Cadmus), in conjunction with Camp Dresser & McKee, Inc. (CDM), and Geosyntec Consultants, were retained by EPA to assess the current status of TMDL implementation tracking in nine different states, including each of the Region 5 states (Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin), two states in Region 10 (Alaska and Washington), and one state in Region 6 (New Mexico). In addition to assessing the current status of TMDL implementation tracking, TMDL implementation tracking needs were also determined for each of the nine states. In particular, each state's needs were evaluated with respect to developing a state-specific or EPA tracking system.

The assessment was completed through a combination of face-to-face meetings with state TMDL, 303(d), and information systems personnel; conference calls with EPA regional and headquarters staff, and web-based research. The purpose of this report is to summarize the results of the assessment and identify recommendations and potential next steps. Information specific to each state interviewed is contained within Section 3 of this report, including examples of existing data tracking systems (for TMDLs or other program information); Section 3 also contains noteworthy information from other states that were not interviewed, but were researched through the internet. Section 4 presents EPA's perspective on TMDL implementation tracking. Sections 5 and 6 present conclusions and recommendations for next steps, respectively.

3.0 INDIVIDUAL STATE ASSESSMENTS

3.1. Alaska

3.1.1. *Current TMDL Implementation Tracking Process*

Most TMDLs in Alaska have a single wasteload allocation, such as to a stormwater permittee, seafood processor, logging or mining operation, etc. The biggest challenge with respect to TMDL implementation in Alaska (and elsewhere), is that its implementation actions are primarily voluntary. Most of their TMDLs do not have competing wasteload allocations. A major challenge in Alaska is determining natural conditions and natural contributions that are difficult to distinguish from human actions. This will be an increasing challenge with significant changes in climate. Alaska focuses more on protecting waters, rather than restoring waters; this focus guides the state's program activities, data collection, and management.

Alaska's TMDL program staff totals 5 full time equivalents (FTE), with 1.5 to 2 FTE dedicated to TMDL development and tracking. The remainder of the 5 FTEs manage the 319 Program, public outreach, and other program elements. Regarding resources, relatively little data are tracked on the vast number of waters in the state. A relatively small amount of funding is allocated to Alaska for such purposes.

Currently, Alaska does not have a shared tool or application for tracking TMDL implementation. Information on TMDL implementation is limited to filing information in electronic folders or email folders. Alaska uses a variety of Microsoft Excel spreadsheets to track minimal summary information on the current status of TMDL implementation. A few years ago, a Microsoft Access-based application was developed to manage basic information on state waters, including pertinent TMDL implementation information. No predefined categories or indicators for TMDL tracking have been developed or are in use in Alaska. The information that is tracked varies by waterbody and is often based on the issues involved. The current Microsoft Excel and Access databases contain information on various priority waters (TMDL waters or not); and if a TMDL is in place, pertinent information on implementation progress is entered.

Alaska is currently using EPA's Assessment Database (ADB) and Grants Reporting and Tracking System (GRTS). Alaska also recently began the process of developing a web-based module addition to its existing Alaska Clean Water Actions (ACWA) database to track and manage information on Alaska's waters, including impaired waters and TMDL actions. The ACWA database was developed from 2002-2005 to bring together information about funding, grants, and expertise on waters. The database is a web-based application used to identify and prioritize impaired waters. Alaska began the process of developing a web-based module and waters of concern, but currently has no capability for managing other information. About 400 waters were nominated, 120 of which are high priority. The application contains limited information; therefore, it is seldom used. Approximately 18 months ago, the state began the development of an addition to its existing ACWA database to track and manage information on Alaska's waters, including impaired waters and TMDL actions, using the desktop Microsoft Access database as a crude model. Alaska currently is using contractor assistance in developing the approach for development of that module.

3.1.2. *Needs with Respect to TMDL Implementation Tracking*

For Alaska, the benefits of tracking TMDL implementation include:

- Ability of management to have an organized place to review and evaluate TMDL implementation progress.
- Ability to quickly generate reports on implementation progress for EPA, state legislature, and the public.

The following key features for a tracking tool were identified by Alaska:

- Ability to move waters on or off impairment lists.
- Ability to track long-term, phased approach to resolve issues in some waters.
- Ability to export data in format that can be loaded into GRTS and ADB.
- Standardized performance measures to determine progress relevant to Alaskan conditions.
- Ability to use with Alaska-specific data (GIS projections, etc.).
- Ability to track biological health of waters (e.g., habitat index, macro invertebrate index, etc.)
- Compatible with Microsoft SQL Server.
- Provides flexibility to easily add features specific to Alaska, such as managing information on climatic change impacts on Alaska's waters.
- Tool that uses same field naming structure and organization of information as is used in other EPA databases (such as GRTS, ADB, STORET), where relevant.
- Clear, logical, and consistent hierarchal approach to identifying the scope of a water "unit." For example, Alaska has found it difficult to prioritize and manage information and approaches on stretches of streams over 40-60 miles in length.

With regards to indicators tracked, Alaska would need flexibility on the type of indicators, as some Alaska TMDLs are very different than others with respect to implementation. Key indicators and tracking measures for Alaska include:

- Completed watershed management plan in place
- Responsible parties identified
- Funding availability/source

Regarding limitations to the use of a tracking system, Alaska has centralized its Information Technology (IT) programs and has restrictions on types of applications it will support. Oracle is not supported. Alaska uses the Microsoft SQL Server, but some discussion about using DOT NET is taking place. Alaska sees little benefit to an ability to directly link to existing EPA databases, but supports the ability to manually import and export data from another system to a TMDL implementation tracking system, like STORET data, ADB, etc.

Alaska feels that the availability of a TMDL implementation tracking tool would provide sufficient incentive to begin tracking TMDL implementation status in the state. Alaska has no preference regarding a state-specific tool or an EPA tool; however, they did mention that any EPA system would need to be flexible enough to handle Alaska-specific issues (e.g., GIS projection), and they would prefer a tool that would be compatible with the ACWA database, as it is used for information about protecting waters as well as restoring waters. Alaska has a willingness to integrate existing state tracking tools with

EPA systems, despite not having had good working experience with current linked databases; for example, EPA's Watershed Assessment, Tracking & Environmental ResultS (WATERS) is not particularly useful to Alaska. If a national or regional tool were not developed, a development plan for a state-specific tracking tool would be attractive to management for consideration and implementation.

3.2. Illinois

3.2.1. *Current TMDL Implementation Tracking Process*

The Illinois Environmental Protection Agency's (IEPA) current focus is on completing TMDLs primarily in rural watersheds. IEPA uses GRTS to track Section 319 program information, but is not directly tracking TMDL implementation information. IEPA has developed another system to track and report similar program information known as the Resource Management Mapping System (RMMS). RMMS was developed by the University of Illinois in conjunction with IEPA, Illinois Department of Natural Resources, and the Illinois Department of Agriculture to track information related to several programs and initiatives, such as 319 project information, social indicators, 303(d) information, *Conservation 2000* efforts, funding allocations and tracking, and implementation schedules. RMMS is a Geographical Information Systems (GIS) tool built using ArcIMS 9.0, and may be viewed at http://www.rmms.uiuc.edu/website/rmms/.

RMMS is accessible to the public, and receives 3-4 visits per day. Some data in RMMS (e.g., land owners) are restricted even for in-house users. It is not currently linked to any other information systems, nor is it linked to water quality information (STORET, which IEPA uses), nor NPDES permit information, but IEPA would like it to be. RMMS was envisioned as a tool for making program information available to public. It currently contains TMDL implementation tracking fields for "TMDL Started" (year) and "TMDL Completed" (year). Financial support for the development and maintenance of RMMS came from the 319 program. RMMS has not been maintained for several years due to a lack of funding.

RMMS provides a number of reports via the website. IEPA can enter data into RMMS, but they have no ability to manipulate it within the system. IEPA has some ability to use the system to generate reports, but it does not function fully as intended. RMMS can give load reduction information, but does not calculate data on a watershed level. IEPA has also developed and maintains a web-based interactive mapping tool (http://maps.epa.state.il.us/website/wqinfo/viewer.htm) that has good GIS capabilities for representing waterbody assessment and water quality impairment information throughout the state. IEPA would like to integrate RMMS and the interactive mapping tool with tracking capability for TMDL implementation and other water quality restoration information.

3.2.2. *Needs with Respect to TMDL Implementation Tracking*

IEPA feels an integrated state-specific tool, or EPA developed application should have functionality for entering and tracking the following implementation information and indicators:

- Implementation or watershed plan approval (date)
- Permits approved (date)
- Implementation started (date)

- Implementation completed (date)
- Monitoring / assessment results
- Water body restored
- Number of acres with best management practices (BMPs) implemented
- Number of acres with conservation tillage / set aside acres
- NPDES permit issuances that include TMDL allocations
- Implementation on a county-wide basis
- NRCS BMP annual report information

IEPA likes the idea of tracking implementation by monitoring, with monitoring triggers being a part of the tracking process. Restoration percentage could be based upon the pounds of pollutant reduced toward the allocation goal. Information on some impairment causes, i.e. septic systems, may need to be tracked, but are outside of IEPA purview.

IEPA feels a tracking system should also be able to be used to report:

- Progress on implementation, to answer local questions, and questions from elected officials
- "Areas of concern"
- EPA requested information
- Effectiveness of implementation efforts between watersheds

IEPA considers key features of a tracking system to include the following:

- Accommodate more than one TMDL per waterbody
- Ability to report out on a statewide, countywide, hydrologic unit code (HUC), and stream basis
- Water quality parameter specific sorting and reporting
- Tracking additional impairment causes that come in after TMDL adoption
- Tracking expected load reductions
- Tracking the success of other watershed BMP implementation efforts / success comparisons
- Adjacent watershed level of interest to gage future TMDL interest

IEPA feels its current systems are not well suited to accommodate TMDL tracking, but could be modified to do so. IEPA would like to link the interactive mapping tool and RMMS, and develop TMDL implementation tracking capabilities from these tools, or with functionality linked to these tools, so that another separate tracking system would not have to be maintained. Any database development and roll-out would be managed by Illinois' IT Department and not directly by IEPA. Coordination with the IT department staff and processes will be required. IEPA dedicates 0.1 FTE to managing data in RMMS, and feels that 0.5 FTE would be a good level for maintaining a dedicated implementation tracking tool.

IEPA wouldn't mind integrating RMMS with another complementary system that allows them to track TMDL implementation. However, they would not like to use an entirely new system for this purpose. RMMS had several funding partners, so funding issues would have to be resolved with any new database. Other agencies have helped develop RMMS, and may want to continue using it.

3.3. Indiana

3.3.1. *Current TMDL Implementation Tracking Process*

The Indiana Department of Environmental Management (IDEM) has developed and is using a database (in both Microsoft Access & Excel) that tracks TMDL development thru completion. This information is also in EPA's Assessment Total Maximum Daily Loads Tracking and Implementation System (ATTAINS) database. IDEM uses ATTAINS to track TMDLs that are submitted and/or approved. IDEM also uses GRTS to track 319 program information. IDEM has also developed an Assessment Information Management System (AIMS) database (that has a Microsoft Access front end with an Oracle back end) that tracks water quality data collected by their assessment branch. AIMS was developed by a contractor. IDEM has five watershed specialists that help administer watershed groups, and help set up and maintain the AIMS TMDL development database.

IDEM is not currently maintaining a tracking process or system for TMDL implementation. Implementation data are anecdotal and communicated either verbally or via emails from various groups, then filed in paper form by waterbody. Information on TMDL implementation comes from the watershed specialists, but not in a predictable or consistent way. There is no database or system in place to track this information, or link it to AIMS or ATTAINS.

3.3.2. *Needs with Respect to TMDL Implementation Tracking*

IDEM feels the benefits of a TMDL implementation tracking system would include:

- Helping to guide program direction.
- Providing for cross program coordination.
- Tracking implementation effectiveness; use of funding.
- Easing the ability to inform the public on implementation successes.
- Providing good information for permit development, monitoring requirements.
- Having some groups set up to be self reporting.

IDEM feels that key features of a TMDL implementation tracking tool could include:

- Web based design.
- GIS interface and analytical features.
- Specific to intended purpose, waterbody restoration, not an add-on to another existing tool; something new that pulls from other existing databases.
- Real-time access to information (no manual update of an off-line database).
- User friendly and well documented – a true user manual provided.
- Designed to answer real questions.
- Ability to get at raw data out of the database for use for other purposes.
- Ability to answer unanticipated questions.
- Information on agricultural practices would make implementation tracking more effective.

IDEM feels that key tracking indicators could include:

- An initial indicator or milestone, such as implementation plan completed.
- Percentage of measures that have been implemented.
- After implementation, monitoring to show changes in water quality (a monitoring trigger).

IDEM would like to have a database system to track TMDL implementation information, and would prefer EPA develop a tool for IDEM to transmit data into. There is no strong driving force to develop a state-specific implementation tracking tool at this time. An implementation database would give IDEM the ability to answer likely implementation questions from multiple sources. IDEM would prefer a web-based, GIS capable system specifically for tracking waterbody restoration. Ideally, such a system would allow users to upload and download data from other in-house systems that they may have.

IDEM would prefer to have a tool less cumbersome than GRTS and AIMS to get data for various reporting purposes, and more functional than its existing databases as far as linkage and GIS capabilities. On-going water quality monitoring data needs to stay in the AIMS database for consistency and comparison over time.

IDEM could be limited by the staff resources necessary to maintain a tracking tool and mine data from it. Because IDEM is not specifically tracking TMDL implementation, IDEM does not currently have dedicated staff for this purpose. If a tracking system existed, IDEM estimates 1-1.5 FTE would be needed to manage TMDL implementation data. IDEM does not currently have budget for this, but would be willing to explore using 319 funds for the staff needed for TMDL tracking. IDEM estimates 12 IDEM staff would need to access a tracking system for various data entry, analysis, and reporting purposes. Having a TMDL implementation tracking system in-house could create never ending ways to tweak or query the data, which may be resource intensive. Limitations could also arise as any new tool would be managed by Indiana's State IT department, and not IDEM.

3.4. Michigan

3.4.1. *Current TMDL Implementation Tracking Process*

TMDL implementation in Michigan is accomplished through National Pollutant Discharge Elimination Systems (NPDES) permit renewals and Section 319 grants administered through the Michigan Department of Environmental Quality (MDEQ) District Offices. However, the State does not yet have a coordinated process to target implementation activities. MDEQ believes that implementation activities are separate from the TMDL development process. Nonpoint source control implementation activities are developed through the watershed planning process supported under Section 319 grants.

MDEQ has begun to focus 319 projects on impaired waters and the next Section 319 Request for Proposals will seek to focus projects on impaired waters. MDEQ may also identify priority watersheds for implementation activities in the future. In addition, MDEQ staff also complete sanitary surveys and may take action to require local governments to address pathogen sources.

MDEQ centralizes 319 grant tracking, but the projects are developed in the District Offices. The Jackson District Office reportedly has the greatest focus on implementation and assigns TMDLs to District staff. MDEQ tracks the grants in a Microsoft SQL Server database with a Microsoft Access front end to facilitate data entry. The projects are located with latitude and longitude coordinates and estimated load reductions are tracked. MDEQ manually uploads 319 project tracking data to GRTS. The State has chosen not to use GRTS as its principal project tracking system, because they find it difficult to use. MDEQ is planning to require electronic reports from grantees.

DEQ also maintains the NPDES Management System (NMS), a detailed database to track NPDES permit status. Data from the Michigan system are uploaded to EPA's Permit Compliance System (PCS). DEQ reports $250,000 to $500,000 in Discharge Monitoring Report (DMR) savings from use of NMS to upload data to EPA's PCS database.

3.4.2. *Needs with Respect to TMDL Implementation Tracking*

The State would like to develop a data system that tracks the number and location of implementation activities by watershed. The State would also like to track the following:

- Load reductions achieved.
- Other watershed grants.
- Municipal separate storm sewer system (MS4) data.
- Concentrated animal feeding operations and animal feeding operations.
- Sanitary sewer overflows and combined sewer overflows.
- Watershed groups, watershed meetings, and public involvement.

MDEQ sees the value of an implementation tracking system, but the State does not have the resources to develop their own system. As a result, they would like to see a web-based tool developed that could be accessed by MDEQ, other agencies and organizations conducting implementation activities, and the public. MDEQ is also limited by the staff resources available to support data systems. Data entry is conducted across the Division.

MDEQ would like to see database templates developed that outline the types of implementation activities suitable for different types of TMDLs and causes of impairment. Templates could prompt watershed groups to conduct implementation activities. MDEQ would also like to provide the public with the ability to add data to the system. MDEQ believes that this approach would support public outreach.

DMEQ would also like to see the system developed in a manner that would support current reporting requirements, such as data provided for GRTS. In addition, the state would like to link water quality monitoring data to allow for an assessment of the impact of the implementation activities on water quality improvements. The system should also link to NMS or PCS to allow for wasteload allocation implementation tracking. By also tracking nonpoint source implementation activities and linking to water quality monitoring data, the system should be able to influence future grant targeting and water quality monitoring activities.

3.5. Minnesota

3.5.1. *Current TMDL Implementation Tracking Process*

The Minnesota Pollution Control Agency (MPCA) is currently implementing TMDLs through the Section 319 grant program and the Clean Watershed Partnership (CWP); however additional resources have recently become available under the Clean Water Legacy Act.

MPCA currently tracks a variety of information regarding the implementation of Clean Water Act watershed programs. The tracked information is documented in the reporting requirements and formats for watershed projects in the following links. The following link is the overall financial assistance page with links to specific topics: http://www.pca.state.mn.us/water/cwp-319.html. Links included in this overall page include:

- Semi-annual budgeting and reporting forms - http://www.pca.state.mn.us/water/cwp-319.html#forms
- Final report format and requirements - http://www.pca.state.mn.us/water/cwp-319-finalreport.html
- Annual reports to EPA synthesized from the projects' semi-annual and final reports and program information - http://www.pca.state.mn.us/water/cwp-319.html#reports. MPCA has worked to make the annual reports more "interesting" in recent years. They contain a summary of implementation activities from the LARS and eLink databases.
- Water quality data submittal for STORET - http://www.pca.state.mn.us/water/storet.html. Data management staff for STORET have done a real nice job in setting up forms and a process for establishing monitoring sites in STORET, submitting data, and reviewing the data.
- The eLink web page is at http://www.bwsr.state.mn.us/outreach/eLINK/index.html. eLink is used to track implementation activities from multiple programs. MPCA requires it for all implementation projects under 319, CWP, and now the Clean Water Legacy Act. The Board of Water and Soil Resources (BWSR) uses it for their state cost-share funds.

Other information sources include the Stream Hydrology Program, which uses a unique database and processing software known as HYDSTRA for storage and management of the data from the network of stream gages (http://www.dnr.state.mn.us/waters/surfacewater_section/stream_hydro/index.html). The HYDSTRA system stores Department of Natural Resource (DNR) Waters stream data, DNR Ecological Resources stream data, and the MPCA stream data. This is the first time the DNR and MNPCA are archiving stream data in the same location. Other DNR divisions and outside cooperators have expressed interest in sharing this data system as well.

HYDSTRA is a collection of database management tools and hydrologic software packages that allows users to store and organize historical data, graphically analyze and edit hydrologic data, store and access digital photos, maps and other documents associated with stream files. HYDSTRA also offers various output formats, both graphical and tabular, to share stream data with others. Flood forecast/warning system gage data are automatically downloaded into HYDSTRA via a satellite link. Stream flow and stage data collected at DNR Waters' special project sites or reported to DNR Waters by hydropower facility operators are also stored in HYDSTRA. DNR flood warning gage data can be accessed at the DNR/MPCA Cooperative Stream Gaging Web page and a National Weather Service Web site.

3.5.2. *Needs with Respect to TMDL Implementation Tracking*

With the advent of additional implementation funding under the Clean Water Legacy Act, MPCA is looking to update its implementation tracking and reporting processes. They have two main objectives:

1. Adapt Business Object Model (BOM) software to better track watershed restoration activities.
2. Work with the University of Minnesota to determine what reports and indicators can best communicate watershed restoration progress to legislators and the public.

As a first step, MPCA developed a report for the legislature on how to communicate watershed restoration results. MPCA is also working with the University of Minnesota to develop a survey and series of focus groups to determine what effectiveness measures interest different audiences.

MPCA has also developed a nonpoint contract tracking (NCT) database as an interim tool. NCT tracks grants and reports. eLink (described above) is also used to track projects funded under 319 and BWSR.

In its new system, MPCA is planning to track economic data, provide live GIS links to project locations, and include flow analyses linked to HYDSTRA.

MPCA is currently not collecting geographic positioning system (GPS) data on BMP project locations. Instead, the agency is drawing project locations on aerial photos or topographic maps.

MPCA also does not currently track reductions in loads. The agency is forming a workgroup to determine means to track achievement of water quality standards (WQS) and procedures for targeting monitoring based on assessments of the status of restoration project implementation. MPCA is planning to devote 1.5 to 2 FTEs for BOM development. In terms of current, ongoing data management costs, the agency is devoting the following resource by data system:

Database	FTEs
NCT	1
HYDSTRA	2
STORET	2 – 3
ADB	1

MPCA would like to see database examples from other states. They are interested in what measures and indicators other states are using and how to communicate with stakeholders.

3.6. New Mexico

3.6.1. *Current TMDL Implementation Tracking Process*

The State of New Mexico has been operating under a 1997 consent order to complete its TMDLs for 303(d) listed waters on a timely basis. As a result, most of the Environment Department's efforts to date have focused on TMDL development, rather than implementation. Implementation tracking to date has primarily focused on wasteload allocation implementation through the NPDES process administered through EPA Region 6. Region 6 also permits MS4s.

EPA Region 6 has looked into modifying GRTS to better track the impacts resulting from Section 319 project implementation. The State and Region are looking at focusing future 319 RFPs on priority watersheds. The State is also developing nutrient criteria that would be implemented through an iterative approach.

The State's Watershed Protection Section encourages the implementation of certain BMPs by incorporating TMDL recommendations into 319 RFPs. When the grantee is selected, the BMPs are incorporated into the project work plan. The State would also like to see better linking of BMP implementation with water quality monitoring results. They believe trends in water quality are an important measure of program success. WQS may not be achievable in all waterbodies. As a result, achieving some improvement is important to demonstrate. Use Attainability Analyses (UAA) and WQS revisions may be suitable for those waterbodies. The Hamus River Watershed is the first to undergo follow-up monitoring to assess the impact of $1 million in funded BMPs.

New Mexico is not currently using a data system to track 319 or other nonpoint source projects. Wasteload allocations implemented through NPDES permit revisions are tracked through PCS. Quarterly reports from grantees are tracked on spreadsheets maintained by program staff. Projects are typically 4 to 5 years in duration.

3.6.2. *Needs with Respect to TMDL Implementation Tracking*

New Mexico would like an implementation tracking tool, especially for 319 grants. They would also like to see other programs and agencies use the tool, such as NRCS, USGS, tribes, and municipalities to better capture the range of implementation activities being pursued in the watersheds. New Mexico has adopted ORACLE as the information technology standard. They would be willing to use a web-based tool, as long as it supports their current reporting requirements.

The state is supporting a cooperative, watershed-based approach to water body restoration activities. They want to collaborate with other agencies and tribes to share resources and promote communication. As a result, they would like to see the tool made available to these other groups to better characterize the bigger picture of watershed implementation.

3.7. Ohio

3.7.1. *Current TMDL Implementation Tracking Process*

Like many States, Ohio is just beginning to track TMDL implementation. To date, Ohio EPA has focused primarily on developing TMDLs. Up until now, virtually all TMDL resources have been devoted to TMDL development. Very little has focused on actual restoration. Approximately 95% of program resources are devoted to TMDL development, as opposed to restoration. Implementation is just getting started.

Ohio developed its own water quality tracking system which is not compatible with ADB. Ohio does track and report GRTS data, as well as prepare semi-annual reports for the nonpoint source program.

The semi-annual reports are the main means of tracking actual implementation activities. Ohio also has its own NPDES permit compliance tracking system.

Implementation has been driven by individual staff. As a result, Ohio is developing a Microsoft Excel spreadsheet to track implementation progress across the program. Maintaining the spreadsheet will be made part of work plans. The spreadsheet will track accountability for implementing the TMDL. The spreadsheet will not track restoration actions.

Ohio uses biological indicators, so they are interested in using them to track implementation progress. Ohio does not do a lot of reporting outside of the agency, including to the legislature. Section 303(d) and 305(b) reports drive the data tracked by Ohio. Ohio's TMDLs have evolved to focus on watershed restoration goals and to identify projects in programmatic work plans.

3.7.2. *Needs with Respect to TMDL Implementation Tracking*

Ohio has had an ongoing problem with ADB, because the state lists by watersheds not segments. However, Ohio EPA would be willing to use a national implementation tracking system. A national data system would have to be consistent with Ohio's use of biological indicators. The database should be a web-based application. Ohio would also prefer a system that fits in with and links existing databases. Current state databases have been set up to meet existing reporting requirements. Their databases would still need to be maintained as implementation tracking systems are developed. Nonetheless, the State supports the development of an implementation tracking database. In ten years, some sort of system will be needed to report on water quality improvement results.

Any tracking system must focus on more than TMDLs and should focus on water restoration in general. Information sources include 319 semi-annual reports, watershed action plans, WRSB and SRF grant tracking. Ohio is interested in a tracking system but has not determined the data set to track to report on implementation progress. The draft spreadsheet is a first step at tracking progress.

Ohio EPA expressed concern over the use of subjective measures to track implementation progress. Ohio uses administrative indicators established by EPA. Administrative indicators include grant issuance, project completion, monitoring, etc. The system should also rely on data gathered by other groups to focus scarce State monitoring resources. The ultimate goal is to de-list waters, but it is hard to come up with progress indicators. Monitoring indicators could also support the ability to de-list waters and focus monitoring resources on other impaired waters.

STORET could be used as an example for an implementation tracking system. STORET was designed to support thousands of interfaces and monthly updates. STORET is now using an XML template as an interface to upload data.

Ten to fifteen FTEs are devoted to database development and management. Existing IT systems need to be updated. Any data system used in the division has to be developed by the IT department. Three to four 4 FTEs are devoted to data entry. The implementation spreadsheet will be maintained by the district offices.

3.8. Washington

3.8.1. *Current TMDL Implementation Tracking Process*

Washington is moving straight into restoration activities with several waters, not developing TMDLs in cases where proven restoration techniques (BMPs) apply. Section 319 funds support most implementation efforts, which are tracked using GRTS. Washington has developed a Watershed Attainment Tracking System (WATS), which is similar to ADB, to track 303(d) and 305(b) information. WATS is also used for TMDL prioritization and has been designed to manage monitoring data for all listings.

A TMDL information database has also been developed (TMDLMDB) to track the following information:

- State staff responsible for monitoring implementation
- Activities (BMPs) being implemented
- Implementation status of individual activities (four levels):
    1. Recommended activity
    2. Planned activity
    3. Implementation in progress
    4. Implementation completed
- Activity location
- Dates, timeframes
- Funding sources
- Lead implementation party / agency
- Estimated activity cost and actual activity cost

This TMDLMDB database is available to the public. The database has a simple query tool that the public can use. WATS and TMDLMDB are both in Microsoft SQL Server 2000 format. Their permitting system is Oracle based, but is currently being updated, and they are not sure what database platform it will end up on. Their internal development platform is Microsoft's .NET. Any new development work will be done in C#.NET.

Washington has also developed a computer application called the TMDL Management System that includes basic data on all TMDLs that have been developed, and also includes provisions for some basic data on implementation. The TMDL Management System uses VB.NET.

Mapping of data is provided by a simple GIS-based query tool, which is also currently available to the public, developed using ArcGIS Server with SDE and SQL Server utilizing a grid system for open waters and lakes. There is also an Environmental Information Management (EIM) database developed by their agency-wide IT group and available to the public: http://apps.ecy.wa.gov/eimreporting/Search.asp.

Washington is working on adding additional tracking data, including the following "Activity" fields:

- BMP (select from list)
- Status

- Implementation dates (anticipated vs. actual)
- Lead agency
- Funding source
- Internal coordinator
- Cost
- Associated monitoring project (link to WATS database)

Washington would like to GIS-link the results of TMDL development, implementation, and monitoring. Washington would also like to collect and track information on effectiveness monitoring and monitoring triggers.

Washington has 0.5 FTE dedicated to database development and management, and 14 FTE as TMDL leads responsible for development and implementation of TMDLs. Reportedly, 8 additional FTE are planned: 4 for the water quality program and 4 for the science and environmental program.

3.8.2. *Needs with Respect to TMDL Implementation Tracking*

Washington wants to keep using and expanding the functionality of their developed systems, and does not want to link to ADB or ATTAINS. Washington is not interested in a database developed by EPA, but is not opposed to sharing their database designs, or even code, with EPA or other states. However, other states would have to accept everything "as-is" since the state is not in a position to provide technical support. Rather than use an EPA system, Washington would prefer to simply provide data to EPA as required, perhaps even as a web-based upload. If EPA wanted to use a Washington system as a basis for a standard national tool, Washington would work with them.

Washington would like to develop an ad-hoc query tool, and would ultimately like to make all data and features available to the public, including developing custom queries for unanticipated data needs. Washington wants to make sure that any tracking system tracks the information that EPA will hold Washington accountable for, which is not clear at this point.

Washington feels that key tracking indicators include:

- Implementation plan developed (one plan at time of submittal, a second more detailed plan one year later)
- Activity (BMP) implementation status
- Monitoring trigger
    - First screening monitoring trigger
    - Then wide scale monitoring aimed at demonstrating the restoration status of the water
- Overall progress toward restored water

Washington feels that linking a tool too tightly linked to TMDL development could be a limitation, as the state is moving straight into restoration activities with several waters.

3.9. Wisconsin

3.9.1. *Current TMDL Implementation Tracking Process*

The Wisconsin Department of Natural Resources (DNR) is in the early stages of TMDL implementation. The state recently appointed the first TMDL implementation coordinator in the State. Some TMDLs have been developed for specific water segments, but progress is being made on developing TMDLs on a watershed basis.

Implementation is focusing on using existing tools, such as Wisconsin Pollutant Discharge Elimination System (WPDES) permits, and existing regulations, principally NR 151[1] performance standards. Wisconsin is currently working on revising its runoff control regulations to allow for site-specific performance in TMDL listed waterbodies. Wisconsin is also working on developing reporting criteria to track implementation of the performance standards on a county basis. Wisconsin is also developing a buffer measure to address phosphorus loads.

Wisconsin is currently tracking water quality restoration activities on a basin- and watershed-specific basis. Wisconsin has 23 basins covering the State. Three watersheds within each basin are updated annually. Currently, the updates are tracked centrally, but the function will transfer to the DNR regional offices.

Wisconsin DNR has invested heavily in developing an implementation data tracking system. The Water Assessment Tracking and Electronic Reporting System (WATERS) was developed to track the status of waterbodies, pollutant levels, impairments, and watershed planning recommendations. Appendix A contains screen captures of the WATERS database. The database is an ORACLE/GIS-based system, which runs off of the State's 24,000 hydrography scale. The WATERS database is internal to DNR, but portions of the system can be viewed externally on the web through the Surface Water Data Viewer.

Development of the WATERS database included external contractor support. DNR invested $20,000 to $30,000 on an initial needs assessment, $50,000 to $60,000 to build the ORACLE system, and $150,000 to $200,000 to link the GIS component. DNR has invested approximately another $400,000 to geo-locate existing BMP practices. Ongoing maintenance requires one full time equivalent (FTE) staff person in the central office and approximately ¼ FTE in each regional office.

Section 319 grants are tracked in the Surface Water Integrated Monitoring System (SWIMS). In 2008, DNR will require grant recipients to provide on-line updates on the status of the grants quarterly. DNR also reports to EPA on grant status through GRTS. DNR recommends the need for XML support to facilitate data transfer. DNR does not track other nonpoint management projects funded through other agencies.

3.9.2. *Needs with Respect to TMDL Implementation Tracking*

DNR reports several support needs to improve on its tracking system. DNR has lost GIS staff and needs assistance to update land use data. DNR would also like to develop tools to assess the recovery potential for water bodies and approaches for assessing the link between permit revisions and TMDL

[1] NR 151: Agricultural performance standards and prohibitions, non-agricultural performance standards, transportation facility performance standards and a process for the development and dissemination of non-agricultural technical standards. (http://www.dnr.state.wi.us/runoff/rules/nr151.htm).

achievement. Finally, DNR would like to see consistent protocols to model agricultural land use impacts on water quality linked to the Midwest Spatial Decision Support System.

3.10. Other States (*not interviewed*)

Other states' implementation tracking activities were also evaluated to a lesser extent than those described above via website searches and brief telephone conversations. Those states include: California, Idaho, Oregon, and Maryland.

California's TMDL development oversight is largely divided among the state's nine Regional Water Quality Control Boards. Brief interviews with state staff revealed that a statewide tool for tracking implementation has not been developed, and there are no current plans to develop a system. Limited implementation tracking may be occurring at the regional level through informal surveys or other similar means. Staff thought that a tracking tool to monitor the activities of the various regions within California would be useful.

In the State of Idaho, the Idaho Department of Environmental Quality and other state agencies form Watershed Advisory Groups (WAG) to assist and guide the development of TMDLs. A typical WAG is made up of staff from the Idaho Department of Lands, Soil Conservation Commission, Dept. of Transportation, and the Department of Agriculture, and any of these agencies may take the lead on developing a TMDL. Each WAG may differ in how implementation tracking is led and performed, so a national tracking system may have to work with several departments.

The Oregon Department of Environmental Quality published TMDL Implementation Plan Guidance in May 2007. The document provides guidance for agency staff and designated management agencies on the development and implementation of sector- or source-specific TMDL implementation plans. In addition, Oregon prepared an implementation tracking matrix (see Appendix B) as a recommended tool to report on implementation progress as a regular component of grant reporting requirements.

Maryland drafted a TMDL Implementation Guidance for Local Governments in May 2006. The Maryland guidance does not specify how implementation plans are to be developed. Instead, the guidance emphasizes the importance of incorporating planning across existing programs from land use planning on down. The State will work with local government advisors to establish a process for documenting specific TMDL implementation plans. While a process is not yet in place, Maryland envisions tracking implementation plans via the State Water Quality Management (WQM) Plan framework per 40 CFR 130.7. WQM Plans, organized by 6-digit basin codes, will incorporate completed TMDLs, identify the document that constitutes the implementation plan, and identify other appropriate supporting information.

4.0 SUMMARY OF EPA'S PERSPECTIVE ON TMDL IMPLEMENTATION TRACKING TOOL/SYSTEM

In addition to the state interviews, several discussions were had with EPA in order to obtain their perspectives and thoughts on the need to track TMDL implementation, including information on what to track (e.g., indicators) and how to track it (e.g., tools).

In terms of the rationale for tracking TMDL implementation, EPA identified many benefits to having a process and central tool in place to compile information and data on TMDL implementation. Some of the benefits are provided below:

- National tracking would allow for the comparison of data across state lines. In turn, this would enable EPA to consistently, from state to state, report on key questions, such as "are we cleaning up our watersheds."
- Regardless of scale, a TMDL implementation tracking tool could help the states to move towards a strategic monitoring approach (instead of a rotating basin approach, for example). For many impaired waterbodies, restoration will take time. For example, it may take five years for a particular waterbody to show significant water quality improvements; therefore, monitoring that waterbody for the first three to five years may not be the best use of monitoring funds. A tracking system could be built to identify implementation milestones and optimal times in which monitoring should occur in order to measure and report on improvements.
- A tracking system could help EPA with national performance measure reporting needs for *Measures L* and *W* from EPA's Strategic Plan. For example, for *Measure W*, EPA regions are asked to report on, for each of their states, watershed improvement (at the HUC 12 scale) based on percent impairment removal. A tracking tool may provide EPA with the necessary information to track watershed improvements.
- A tracking tool could help illustrate not just how Section 319 funds are being used, but also the quantifiable results of the funding (i.e., the actual waterbody improvements).
- A national tracking tool could allow for reporting on implementation funded by multiple agencies (and not just EPA and the states), including NRCS and USDA. Many agencies are contributing resources toward water quality improvement efforts. There currently isn't a means to track the individual and combined efforts of all the players, but there should be.
- A tool could serve as a linkage between programs (TMDL, permitting, 319, etc.)

EPA began identifying some of the key needs that a tracking system would have to allow for, including:

- Ability to track and report on interim milestones for TMDL implementation and not just the single end goal of achieving WQS. Given the length of time it takes for waterbodies to return to full attainment, it is critical to identify and track indicators and benchmarks for incremental progress. Delays in waterbody recovery are legitimate. We need to begin thinking about success in terms of both incremental progress and full recovery.
- Ability to track EPA-funded and non-EPA funded project (e.g., Farm Bill projects)
- Tool should be built similar to WATERS, where data can be queried and extracted out for reporting purposes - for state, legislature, EPA, and public reporting.
- Tracking should include both programmatic progress and environmental progress. For example, one programmatic milestone may be whether or not the recommended / required controls (e.g.,

permits) have been implemented. The environmental milestone would be the progress of that control to improve water quality.

- Tracking tool needs to support the ability to report on both subjective measures of success (e.g., "have water quality conditions improved since last monitored") and detailed quantitative measures of success (e.g., "by how much have pollutant loads decreased over the last three years?").

While EPA recognizes the significant benefits of having a national or regional TMDL implementation tracking tool, they also acknowledge that developing such a tool will require significant thought and planning. Otherwise, they run the risk of developing a tool that states would not use or a tool that does not help with reporting needs because it isn't collecting the right data or information. The following are a few examples of the types of questions and issues that would need to be explored before constructing the tool itself:

- Should the tracking tool operate on a national or regional level?
- Would a national/regional database be built for the benefit of the states and their reporting needs, or for the benefit of EPA and its reporting needs? If for both, is it realistic to achieve alignment between EPA needs and state needs, such that a system could allow for flexibility to keep tabs on items of importance to both states and EPA?
- At what spatial scale (e.g., individual waterbodies, *Measure W* subwatersheds, etc.) will information need to be reported? At what spatial scale does information need to be collected in order to meet this reporting need?
- What "questions" will be answered using the database. For example,
    - Have WLAs been incorporated into all permits
    - What actions/BMPs are planned?
    - What were the resource expenditures for BMPs? Federal, state, county, other
    - Are BMPs being maintained?
- What type of information will need to be reported to the public, to congress, etc. (e.g., "on how many waterbodies is implementation occurring" or "how many waterbodies have improved by 50%")? What are the indicators for which data need to be collected in order to meet this reporting need?
- What is the feasibility of being able to interface a national or regional tracking tool with existing state tracking systems? Is there willingness on the part of those states to adapt their systems to link with a national or regional system? Could it be possible for those states to use a linkage identifier (e.g., 303(d) list ID) that would permit linkage between an EPA and a state database?
- How are "success" and "progress" defined with regards to water quality improvements?
- What are the success benchmarks and milestones?
- Do we populate the tracking system with "past" information or just focus on capturing current and future data? If we look at incorporating past information, how far do we go back to illustrate how past resources have been used (and the results).

EPA did not discuss the architectural framework for the tracking system or database platform in extensive detail, primarily because they felt it was more important to talk about the purpose of the tracking system and the type of information to track. However, several key points were made. To start, EPA should first examine existing state tracking systems for ideas on the architectural framework for a

national or regional database. Important features to consider include: interactive mapping, GIS linkage, web-based application, and public access. It was also suggested that existing EPA databases and tracking tools first be examined to assess whether they can be modified to also allow for TMDL implementation tracking or whether a new, stand-alone system would be the better way to go.

5.0 CONCLUSION

The Office of Inspector General (OIG) noted the need to report information on TMDL implementation activities and on the water quality improvements associated with TMDLs. In a September, 2007 report[2], OIG recommends that the Office of Water demonstrate that TMDLs are being implemented by annually reporting on the progress of TMDL implementation activities completed nationwide including the number of TMDLs that have all wasteload allocations incorporated into NPDES permits and have implemented load allocations through at least one BMP funded through the Section 319 Program. OIG further recommends that the Office of Water demonstrate the results of implemented TMDLs by annually reporting on the progress of water quality improvements resulting from TMDLs nationwide.

EPA does not have the authority to require states to track TMDL implementation, and this has been acknowledged repeatedly by many individuals at EPA, including Ben Grumbles. The purpose of this assessment was not to prepare for a future impending EPA requirement. Rather, this assessment was undertaken in an effort to be proactive. EPA believes it is important to begin thinking about how best to track the implementation of TMDLs and report on the level of waterbody restoration. From EPA's perspective, it would be wise to begin looking down the road and consider what might be asked of them in terms of reporting on interim measures of success. It would be better to be proactive and have EPA and the states identify and define the interim measures of success themselves rather than have an agency, such as the Office of Management and Budget OMB, dictate the measures of success to them.

Because many States are just beginning the process of implementing point and nonpoint source control measures to achieve water quality restoration, this is an ideal time to develop a tracking system to account for practices to improve water quality (either on individual state levels or at the regional or national level). The tracking system development process should acknowledge and complement the data management systems that have been developed by several of the States. In addition, the States would greatly benefit from the ability to learn about other implementation activities, such as those funded under the Farm Bill. Collecting such information will likely require the development of inter-agency coordination at the Federal level.

Of the states not currently possessing a tracking system, none have allocated funding for developing a system. States with tracking systems have either no budget allocated, as development of the existing system is complete, or have limited funding planned for ongoing development. States without tracking systems have concerns about the level of resources necessary to develop a system (both internal and external resource needs) and concern over the internal resources necessary to maintain data entry and reporting. Most states interviewed felt that 0.5 to 1.0 additional full time staff equivalents (FTE) would be necessary over current staffing levels for the data entry, maintenance, and reporting they would envision if a system were in place.

[2] *Total Maximum Daily Load Program Needs Better Data and Measures to Demonstrate Environmental Results.* 2007-P-00036.

6.0 NEXT STEPS & RECOMMENDATIONS

Several states have already developed a system to track TMDL implementation information, while most are still primarily focused on TMDL development with little to no tracking of TMDL implementation. The existing systems range from simple approaches (e.g., spreadsheets) to complex approaches (e.g., GIS and web-based systems with query and report functionality).

For those states that have not currently developed a tool capable of tracking TMDL implementation, but would like one, it is recommended that states:

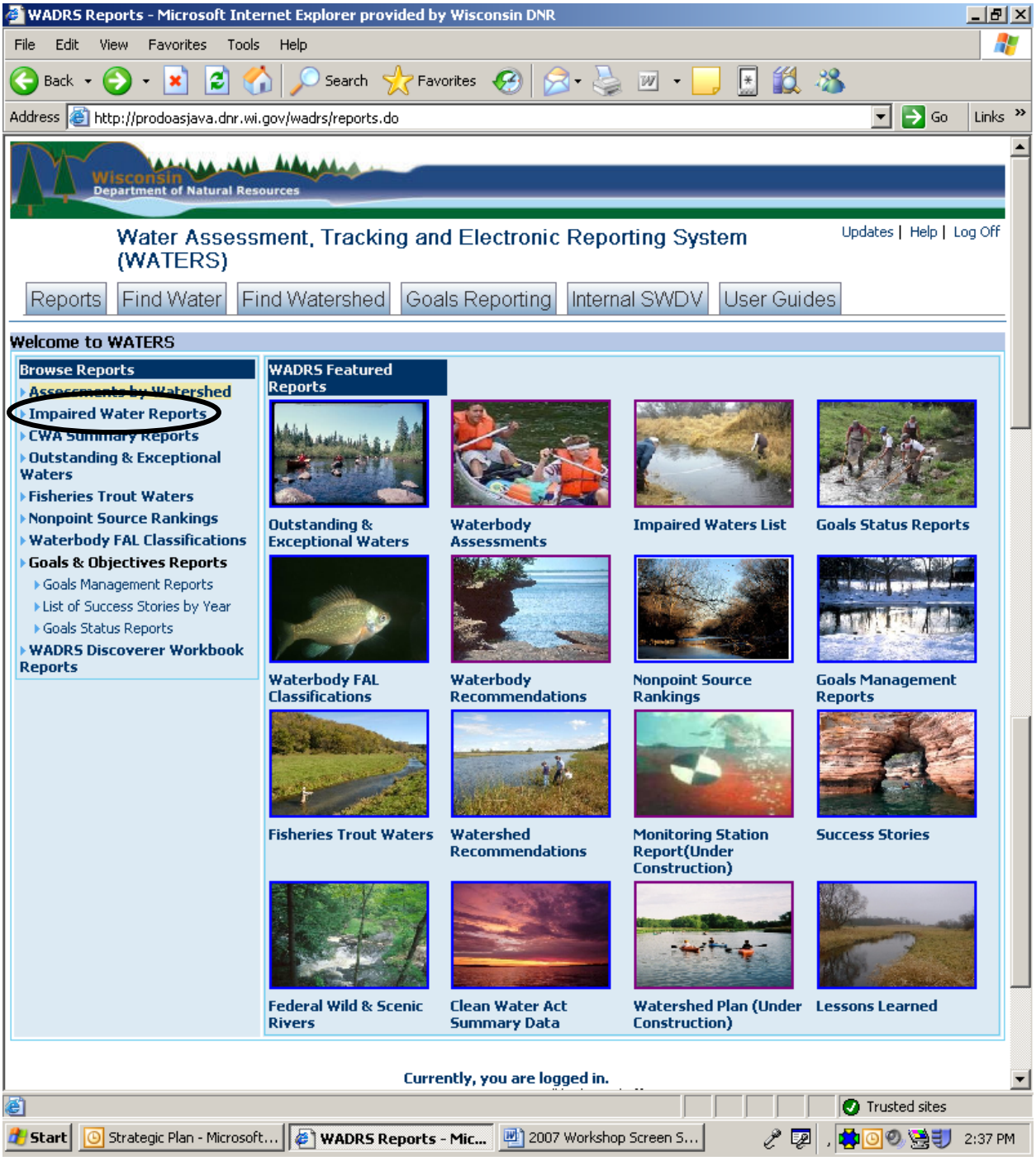
- Develop a set of indicators that they see necessary for proper tracking of implementation measures. States should work with EPA on developing these indicators, in order to be as consistent as possible. Minimum implementation indicators would include:
    - TMDL adoption
    - Implementation plan development and approval
    - Responsible implementation parties
    - Allocations incorporated into permits
    - Completed projects
    - Water quality monitoring triggers
    - Restoration evaluation
- Identify the foreseeable implementation questions that will be asked by multiple stakeholders and funding sources. These questions will help determine the information that should be tracked.
- Begin tracking the information with a tool easily linked to or replaced by an EPA developed system, such as with a Microsoft Access system.

A pilot tracking system with one or more states (or an EPA region) would provide excellent insight into the challenges and success factors for a national EPA developed system. Two pilots are recommended - one with a state without an established tracking system and one with a state with a well developed system (e.g., Wisconsin). Piloting with a state without a tracking system (or a basic Access or spreadsheet tracking system) would demonstrate the effort necessary for developing a system for most states, while piloting with a state with a more advanced system would demonstrate the types of integration challenges that may be faced with states that wish to continue to use their established system and integrate with an EPA developed system.

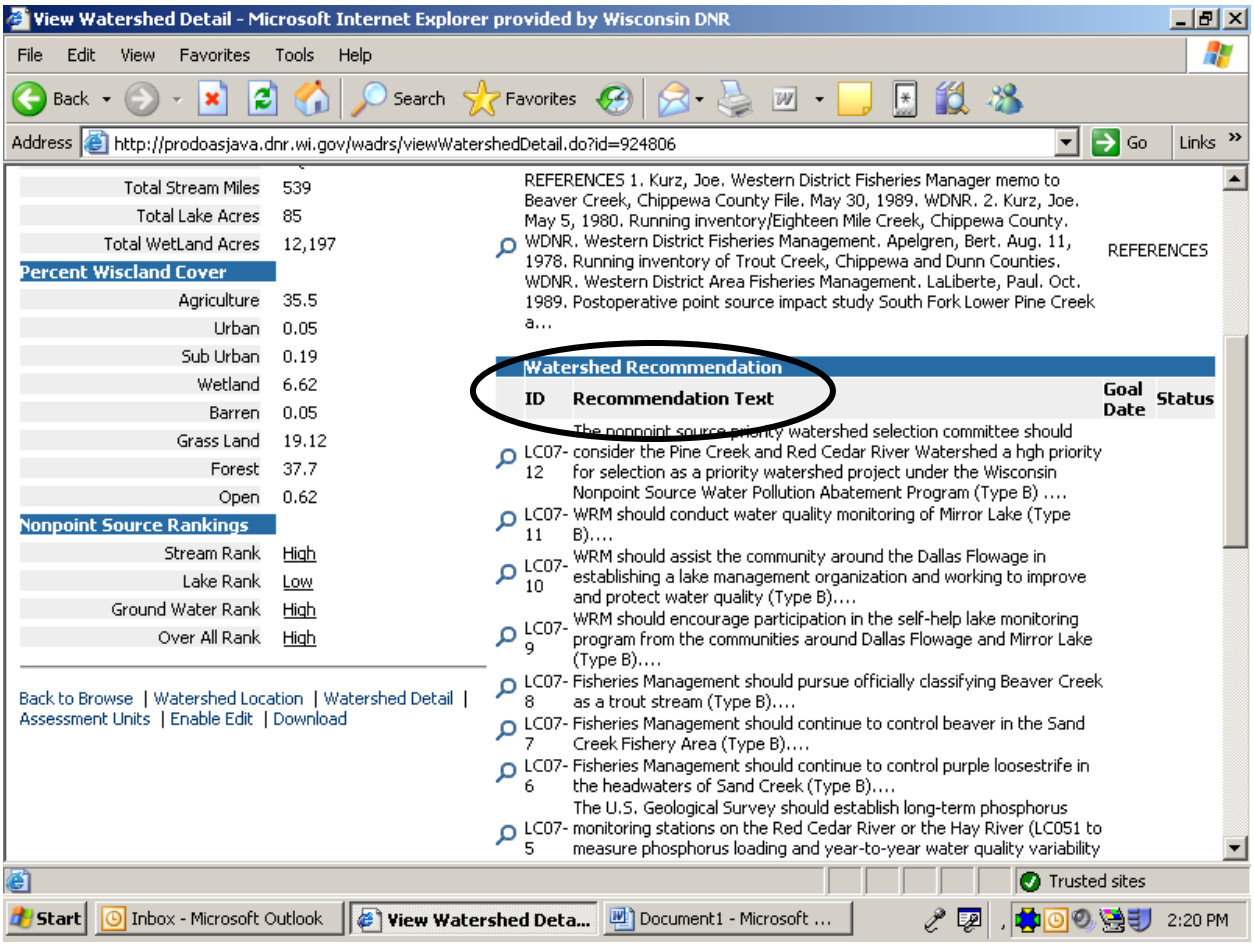
Finally, EPA should also further explore many of the questions and issues identified during their discussions (see Section 4). These questions and issues need to be expanded upon prior to developing a state, regional, or national TMDL implementation tracking system. If a pilot effort were to ensue, it is suggested that answering these questions be a first step in that process.

APPENDIX A. WISCONSIN'S WATER ASSESSMENT, TRACKING, AND ELECTRONIC REPORTING SYSTEMS (WATERS)

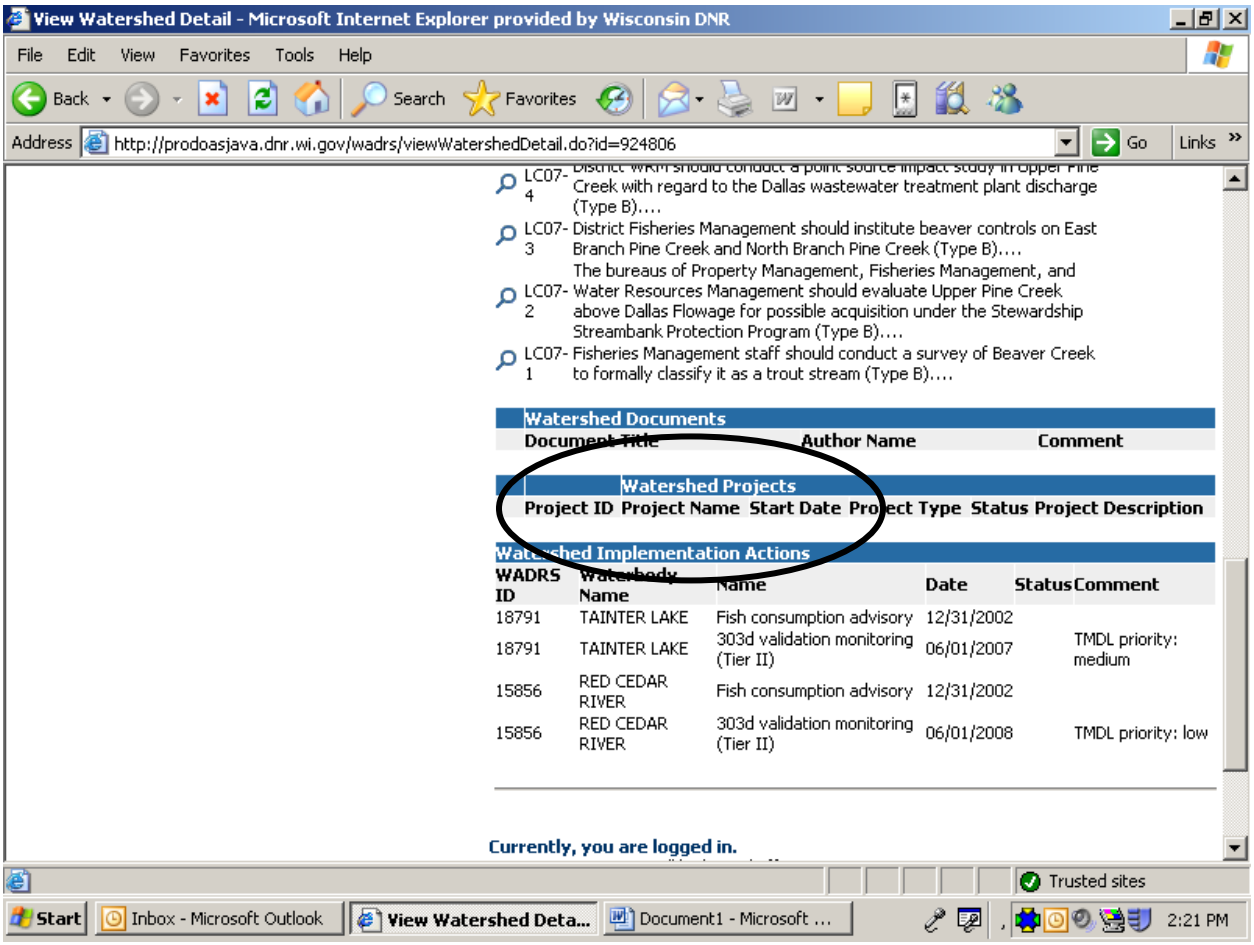
WATERS Home Page



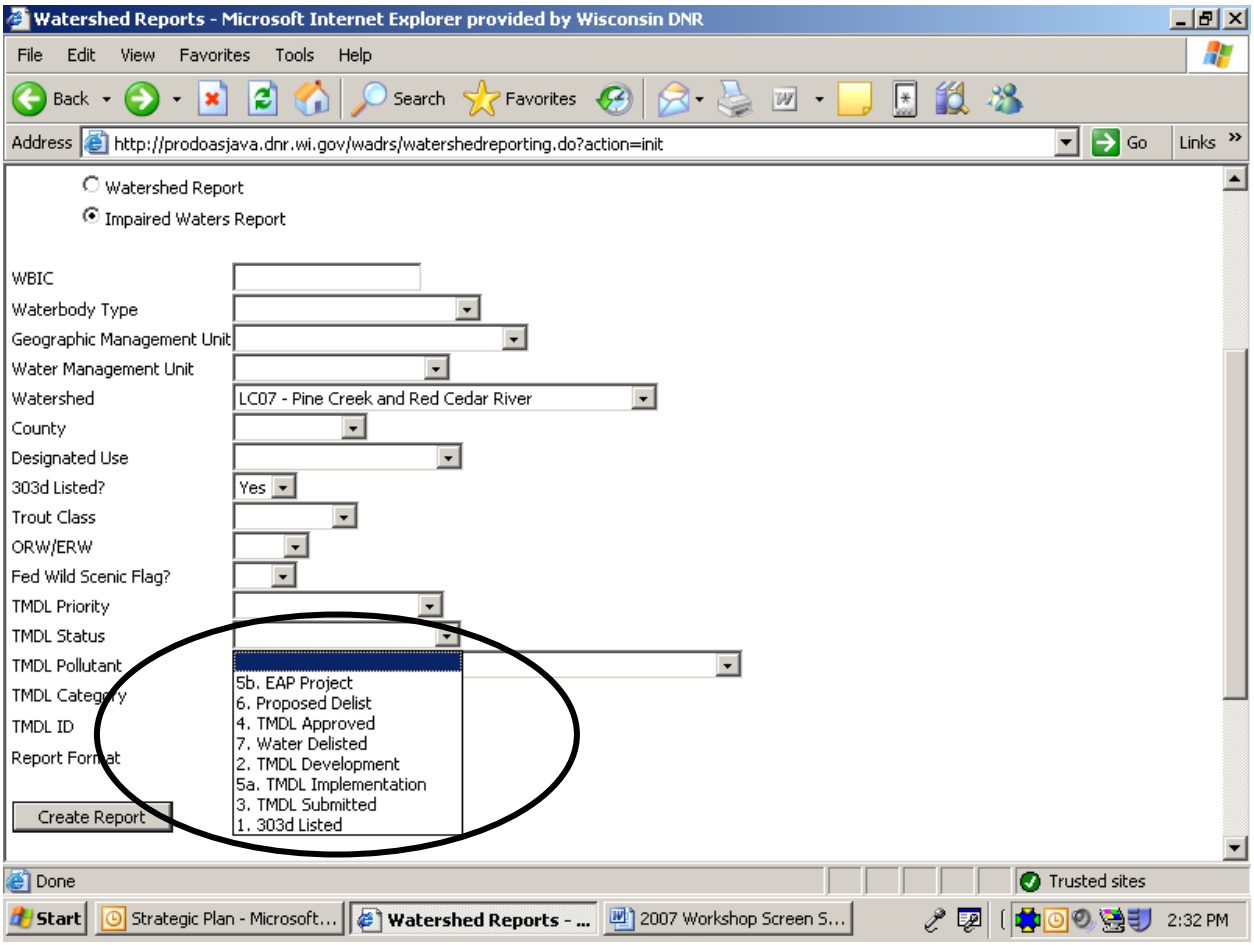
Watershed Results: Watershed Recommendations



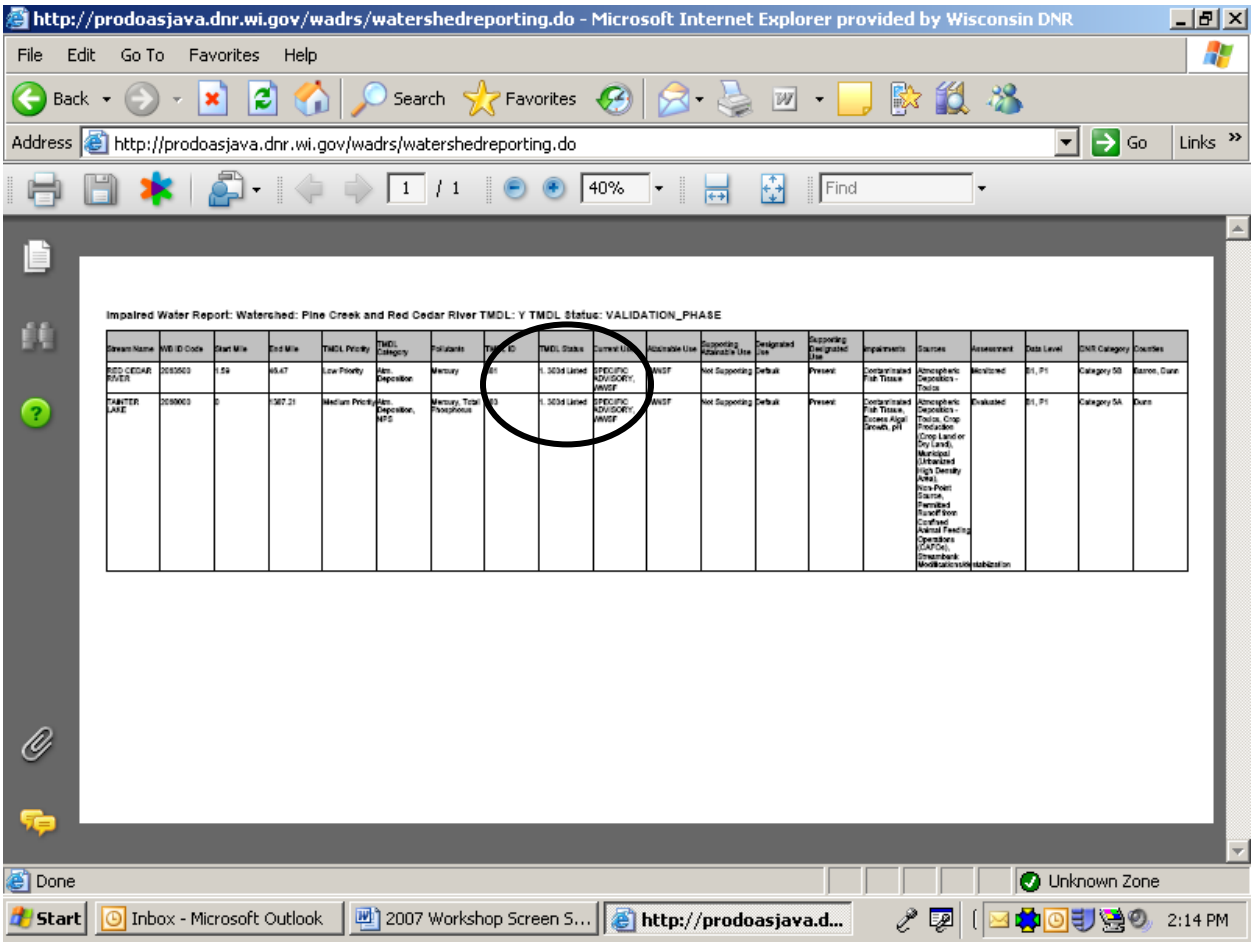
Watershed Results: Watershed Projects & Implementation Actions



Impaired Waters Report: TMDL Categories (Status)



Impaired Waters Report: 303(d) Listed



APPENDIX B. EXAMPLE OF OREGON'S TMDL IMPLEMENTATION MATRIX TEMPLATE

POLLUTANT: Bacteria						**City of Example: TMDL Implementation Tracking Matrix**	
SOURCE *What sources of this pollutant are under your jurisdiction?*	**STRATEGY** *What is being done, or what will you do, to reduce and/or control pollution from this source?*	**HOW** *Specifically, how will this be done?*	**FISCAL ANALYSIS** *What is the expected resource need? Are there existing resources budgeted? If not, where will the resources come from?*	**MEASURE** *How will you quantitatively or qualitatively demonstrate successful implementation or completion of this strategy?*	**TIMELINE** *When do you expect it to be completed?*	**MILESTONE** *What intermediate goals do you expect to achieve, and by when, to know progress is being made?*	**STATUS** *Include summary and date.*
1. Failing septic systems	a. Ensure repair of failing systems	i. Respond to reports of failing systems; work with homeowner to set a timeline for repair	Already funded; see specific program budget	Track # of reports, outcome of inspection (failing or not) and date of follow-up that confirmed repairs were made	Ongoing	NA	
	b. Educate homeowners about system maintenance and how to detect failures	i. Mail DEQ info. to X homeowners	$X	Number of brochures mailed	Once every two years by May 1	NA	
		ii. Provide info at city's booth at community festival	No additional resources needed	Number of contacts	July of each year	NA	
2. Bacteria carried to waterways in storm runoff	a. Address runoff problems from farms via SB 1010 plans (ODA)	i. Contact ODA when problems are identified	No additional resources needed.	Track # of referrals	Ongoing	NA	
	b. Prevent pet waste from reaching waterways	i. Erect signage and provide poop bags in parks	$X borrowed from park tree planting budget	Check bag supply weekly;	Ongoing thru end of 2008; evaluate effectiveness based upon rate of use	NA	
		ii. Get article in local paper to raise awareness	No additional resources needed; newspaper donating column space	Article in paper	Summer 2008	NA	
		iii. Adopt ordinance requiring owners to clean up after their pets		Adopted ordinance	2008	• Convene Advisory Committee by 12/06 • Draft rule by 6/07 • Adoption by 2/08	