A PARTIAL LIST OF USEFUL WEBSITES

www.bwsr.state.mn.us
www.dnr.state.mn.us
www.ardc.org
www.mhbriverwatch.dst.mn.us
www.crh.noace.gov
www.riverwatch.noaa.gov
www.pca.state.mn.us
www.co.aitkin.mn.us
www.usace.army.mil
mn.usgs.gov
www.aitkinswcd.com

Section II.
AITKIN COUNTY WATER PLANNING PRIORITY CONCERNS SCOPING DOCUMENT
JUNE 2008

Bass Lake Conservation Easement
(completed December, 2007)

AITKIN COUNTY WATER PLANNING
PRIORITY CONCERNS SCOPING DOCUMENT

"It is the mission of the Aitkin County Water Planning Task Force to promote responsible stewardship of water and land resources through education, incentives, and collaboration with individuals, groups and government entities."

Local Water Planning is a success in Aitkin County. Task Force involvement and interest remains high and is a key factor in our continued success. This plan is intended to be flexible and to be modified by the Task Force Membership as needs and opportunities are identified.

Aitkin County is located in the northeastern part of central Minnesota. The county seat, Aitkin, is approximately 126 miles north of Minneapolis-St. Paul and 87 miles west of Duluth. Aitkin County has an area of about 1.2 million acres of which 113,000 acres is surface water. Land ownership in the county is approximately 46 percent private, 34 percent state, 19 percent county, and 1 percent federal.

Population trends show an expected increase in both numbers and average age of the citizen's in the county. The county's population is about 15,910 (2007) up from 15,301 (2000) and 12,425 (1990).

Development trends: In the past 15 to 20 years, Aitkin County has experienced rapidly increasing residential development. Lakes and rivers are being developed for weekend cabins so quickly that demand for riparian lands has forced prices to more than double in the past ten years. (Woods and Shores Real Estate). The trend is toward larger homes and larger related buildings (i.e. garages, pole buildings) on existing lakeshore lots. To a much smaller degree, some small lots are being consolidated with adjacent lots to create a larger building and recreation area.

The second major development trend applies to recreational acreages. These parcels typically vary between 10 and 100 acres with most parcels averaging about 40 acres in size. These parcels are usually used for seasonal cabins and outdoor recreation. Demand for this type of property has also increased dramatically as evidenced by approximately a doubling of recreational property values. It should be noted that accessibility, location, and other factors influence values.

Approximately 90,000 acres is currently in cropland of which the principal crops are hay, small grains and corn. Specialty crops such as potatoes, strawberries and wild rice are grown in the county; Aitkin is the largest wild rice producing area in the state with approximately 8,000 acres of paddies.

Privately owned lands comprise 46 percent of Aitkin County, with approximately one-fourth in some form of agricultural usage (not including forestry activities). About 65 percent of the county is forestland. Of this forested area, approximately 40 percent are under-stocked cover types (marsh, bog, brush land). The other major cover types include: aspen-birch, northern and lowland hardwoods, and conifers.

The Aitkin County Water Planning Task Force has a membership that is large and diverse. We invite anyone who is interested in water issues to attend and become a member. This membership policy has served us very well by creating a forum to express new ideas and explore solutions. We have sought additional public input in a variety of ways including:

1. We conduct regular monthly meetings and enjoy input from a good cross-section of citizens.
2. We publish newspaper articles that describe the public participation and request additional participation.
3. We had an informational booth at the Aitkin Rivers and Lakes Fair in June (approximately 425 attended)
4. In the past year we have talked with about 10 lake associations to gather their input for the water plan

We estimate that 600 – 700 citizens have provided input so far:

SUMMARY OF APRIL 18, 2007 WATER PLAN COMMENTS AND CONCERNS

Shoreland management
Shore land Erosion/Poor practices affect H2O quality
Marginal lots/ properties development
Impervious surfaces/ runoff/ buffers

Conservation of Wild Areas
Conservation easements/ private
Maintain/ retain public esp. riparian

Protection of undeveloped shallow/ fragile lakes
Set back of feedlots- ag operations
Construction activities
-sediments/deltas
- policing

Increased population/development pressures
Enforcement of updated ordinances
Conservation design as a remedy for "over"-development
Long-term effects of mining
Weekend/Holiday Pressures
Monitoring/data
Lack of ground water quality data

Impact of environmental issues/energy, climate change, bio-fuels, farmland protection, bio-mass, cutting/managing wetland grasses/veg.
Continue/Expand Monitoring with a purpose
Lack of current land use data
Surface (recreational) water uses

Impact of recreational uses
-ATV's/PWC

Bank and shoreline erosion
-Boat wakes

Preservation of fisheries, especially native species
Damage by ATV's/etc.
-ruts, erosion, compaction, veg., funding repairs

Fish house waster and toilet facilities (septage)
Education

Education/ Sharing data/ Info
What has been accomplished as a result of water planning (20 Years)
-Grants/ on the ground results/ etc

Public education
We need sign: "Shoreland Ordinances Enforced" w/ phone number 1-800-
Info/education from other sources
-new articles, groups, townships

Annual progress review- water plan
River watch -reinstate & promote
MHB – restore funding
Water Plan funding
County Commissioner contact/update (minutes)
New residents –education, etc.
- Paradigm shift, lawn vs. shoreline

Rain gardens – water quality
Surface water use/boating regulations (conflicts)
Watersheds/groups
Aitkin County Lakes And Rivers Assoc. (ACLARA) involvement
Organize concerns- discuss/ as a resource
Concerns-assessment- ACTION

Public meeting for input
Co. Aquatic vegetation plan (Mngmt)
Water Quality monitoring plan
Indifference to ordinances- enforcement-penalties
16.5' grass buffer along ditches
Need for adequate staffing levels for enforcement, etc.
Piggy backing- w/other organizations, churches, groups, lake assoc., townships, Rivers & Lakes Fair, Commerce Show, programs, education, livestock groups, 4-H
Radio Talk Show- Newspaper Article
Lack of knowledge of aquatic plant values
Drainage/flooding/water quantity

Public & Private Drainage Systems
Water level changes "ROPE"
Lake level control/ Mille Lacs

Co. ditch system improvements/maintenance
Flood Diversion Channel
Ditch Management Plan
Beaver Control

Public ditch law – Natural resource management

Nutrient reduction/groundwater

ISTS/SSTS
Nutrient loading/algae

Waste disposal -municipal/septage/hazardous
NaCl/CaCl de-icing & dust control
Ground water quality
-abandoned wells (sealing)/ contamination possibility
Heavy metals/mercury/TV's/monitors
Underground Storage Tanks- mostly addressed

Incentive versus regulation, voluntary rather than mandatory, these projects do the most for the effort and dollars expended. We have developed a Conservation Easement Program that protects high value properties that are currently being compromised by rapidly increasing lakeshore values and development. We help fund and support the County's Shoreland Management Ordinance and the one to one contacts with lakeshore property owners. Native vegetation saved, soils kept in place and education of shoreland stewards are benefits of these personal contacts.

Surface water quality relates to both lakes and streams and is variable depending on the local watershed conditions, shoreland vegetation, increasing impervious areas (roofs, driveways, compacted ground) and effective septic systems.

Priority concerns were identified by the Water Planning Task Force in many regularly scheduled Task Force meetings. Task Force meetings are held the third Wednesday of the month and are open to anyone.

These priorities have been grouped into five categories that are described in the following sections

1. **Surface Water Management**
2. **Land Use and Development**
3. **Ground Water Quality**
4. **Fish and Wildlife Habitat**
5. **Education**

1. Surface Water Management

A. Coordinate with cities and townships on storm water management plans

1. Encourage all municipalities to develop new or update existing storm water management plans.
2. Promote educational awareness of current National Pollution Discharge Elimination System (NPDES) regulations and encourage its compliance
3. The County will oversee the operation and maintenance of the public ditch system
4. The County will take on the responsibility of operation and maintenance of the Flood Diversion Channel
5. The County will continue to be involved in the U.S. Army Corps of Engineers ROPE Study. This Operating Plan may have significant impacts on water levels and water quality throughout the Mississippi River Basin.

B. Update and expand data collection and monitoring through Water Planning funds and MPCA CLMP Plus.

1. Coordinate with the MPCA to continue baseline water quality monitoring on at least several lakes per year throughout the county
2. Apply for and receive funding through external sources to accomplish desired testing
3. Continue to coordinate and promote the Citizens Lake Monitoring Program (CLMP) and CLMP+ programs

C. Participate in Total Maximum Daily Loads (TMDL) studies where appropriate.

1. One section of the Mississippi River, and all of Big Sandy and Minnewawa Lakes have been added to the MPCA's list of impaired waters. This water plan will identify mitigation measures that may be used to help improve these and other threatened waters.

2. Land Use and Development

A. Support Shoreland Management and Protection

1. Be involved with the design of major projects from an environmental review stand point and how they compare with the County Water Plan
2. Review storm water run-off designs
3. Look at total watershed cumulative impacts
4. Promote the enforcement of current shoreland ordinances
5. Provide education of current regulations to property owners, contractors, developers
6. Promote conservation easements for water quality and other environmental purposes

B. Promote riparian buffer zones

1. Continue to provide shoreland revegetation workshops
2. Promote no mow zones on waterfronts and wetlands
3. Continue to support the use and sale of native plants

C. Continue and expand the appropriate use of conservation easements on high priority sites.

1. Work with landowners to protect shoreland property from subdivision and intensive development
2. To address the problems of forest fragmentation, explore the concept of forest legacy conservation easements.
3. Promote Forest Stewardship plans and Sustainable Forest Incentive Act as incentives for landowners to retain their properties and delay or avoid subdivision
4. Support Conservation Design Sub-divisions where appropriate

3. Ground Water Quality

A. Maintain and protect the quality of Aitkin County's ground water resources.

1. Encourage Well Construction and Abandonment that follows State Guidelines
2. Continue cost-share assistance to private landowners for sealing abandoned water wells.
3. Request MPCA inspection of records and sites of MPCA-approved septage and municipal sludge disposal areas for runoff control and correct disposal amounts.
4. Support increased levels of assistance to local landowners for agriculture erosion and sediment control.
5. Identify and increase funding sources for upgrades, including cluster systems

4. Fish and Wildlife Habitat

A. Develop a plan for lake users to evaluate the presence/absence of invasive and endangered species, then use this data as a baseline for ongoing monitoring

B. Monitor new development to encourage use of riparian and littoral aquatic best management practices

C. Promote riparian buffer zones

1. Continue to support shoreland restoration workshops and secure funding for continuation and on the ground project completion
2. Promote the protection and re-establishment of native vegetation along shorelines
3. Encourage adoption of appropriate portions of the Alternative Shoreland Standards

5. Education

Education is a major component of all of the previous priority concerns. It was felt that in order to raise the awareness of the role that environmental education plays in maintaining and improving our water resources and other associated natural resources that it warranted a priority of its own. We have identified many target audiences Current and seasonal residents including: new property owners, recreational users, Lake and River Associations, Contractors, Realtors, and students.

A. Develop presentations and/or brochures that focus on providing solutions and the positive aspects of being good land and water stewards

1. Actively pursue opportunities to conduct meetings, training sessions, and professional development
2. Promote the quality of Aitkin County and the need to protect and enhance its natural resources

B. Promote the development of new lake and watershed organizations

1. Continue to seek out interested groups willing to take an organized approach to watershed management
2. Continue to support and foster the development of existing associations that exemplifies the best management practices implemented at the grass roots level

C. Promote the importance and value of fish and wildlife habitat to our residents and recreational users and to the economic viability of the county.

ENHANCED/EXPANDED WATER PLANNING

Phase I

Phase I of this project consists of forming a management strategy for all lakes and rivers in the three counties. It is recognized that this will be a lengthy task and will require a compilation of available data and the separation of the lakes and streams by size in order to make the task less daunting. The project will address the largest lakes in each county through a contract with an engineering firm that will gather available data and compile it into a management strategy for the numerous lakes that exceed 1000 acres in size. Approximately $30,000 is in the budget for the contract work described above. With the largest lakes handled by the engineering firm, this will allow more time to be spent on the smaller lakes by local SWCD Staff.

Surface water quality relates to both lakes and streams and is variable depending on the local watershed conditions, shoreland vegetation, increasing impervious areas (roofs, driveways, compacted ground) and effective septic systems.

Water quality data assessment for lakes in excess of 1000 acres:

*Cass (25 lakes)	$14000
*Crow Wing (16 lakes)	$9000
*Aitkin (6 lakes)	$4600
Total	$27600

With the protection of our lakes becoming more of a priority these days, it is necessary to gain a more in-depth understanding of the surrounding influences which both directly and indirectly affect water quality. Through a more thorough look, we will be better prepared to develop lake management goals and determine action steps to maintain and improve the water quality within the

County. Lakes greater than 1000 acres in size will be assessed for water quality and watershed land uses.
The goal is to compile all available lake and stream data from Aitkin, Cass, and Crow Wing Counties. This data will be assessed and summarized in a final report to be used in the county water plan and be distributed to the public. The original proposal from RMB was just for 15 lakes in Crow Wing County. Due to the expansion of this project to include Aitkin and Cass Counties, with 45 lakes total, we have provided a new estimated budget.

This budget includes the time commitment for larger lakes which have numerous monitoring sites and monitoring agencies/organizations. The lakes to be included in the assessment are listed in Table 1.

PHASE 1

Lakes greater than 1000 acres

A. Compilation of available data
1. Identify data sources
2. Contact Sources (written, phone, electronic)
3. Gather and organize returned data and metadata, site ID confirmations
4. Generate compilation database
a. TP, CHLA, Secchi enter to website and *Excel*
b. DO/Temp, others parameters in *Excel*
B. Data Assessment (focusing on TP, CHLA, Secchi)
1. Identify data gaps
2. Comments on data other than TP, CHLA, Secchi
3. Identify statistically usable data
4. Statistical analysis and assessment where possible
a. Trend analysis, long term and seasonal
b. Confidence intervals
5. Water body comparisons
a. Within basins and Ecoregion
b. Between morphologically similar water bodies
C. Summarization and Reporting
1. Format data and summarize for professional review, include raw data appendix
2. Format data and summarize for general public (laymen's terms)
3. Include maps of each lake with monitoring sites indicated

Streams

A. Compilation of available data
1. Identify data sources
2. Contact Sources (written, phone, electronic)
3. Gather and organize returned data and metadata, site ID confirmations
4. Generate compilation database
a. DO/Temp, TP, OP, TSS, staff gauge, flow, volume, loading, other available parameters
B. Data Assessment
1. Identify data gaps
2. Identify statistically usable data
3. Statistical analysis and assessment
a. Trend analysis, long term and seasonal where possible

b. Confidence intervals
4. Determine loading where staff gauge/depth down and flow data are available
5. Determine effects from precipitation events by graphing stream parameters against local precipitation data
C. Summarization and Reporting
1. Format data and summarize for professional review, include raw data appendix
2. Format data and summarize for general public (laymen's terms)

Table 1. Lakes to be included in the assessment report (Aitkin County).
Lake ID Aitkin

01-0209 Cedar
01-0159 Farm Island
48-0002 Mille Lacs
01-0099 Gun
01-0142 Hill

Expenditures
Phase 1 *(not to exceed $30,000)*---------- **$27,600**
Completion date ---------- **April 1, 2009**
Phase 2 ---------- up **to $30,000**
Completion date ---------- **April 1, 2009** *or* **year two of grant cycle**

PHASE 2

A. Overview of Morphometric, Watershed, and Fishery Characterization
1. County, watershed, and subwatershed summaries
a. Land cover / land use (acres and percentages)
b. Impervious area, percent impervious area
c. Aerial imagery
d. Topographical mapping
e. Soil Mapping
f. Wetland Inventory
g. Lake morphology
h. Other available geospatial information
2. Fishery Characterization
a. compile DNR fisheries report for each lake
3. Identification and listing of suspected or "cause for concern" nutrient loading areas
a. Use of geospatial information
b. Provide recommendations for ground truthing areas

Education:
Education is a major component of all of the previous priority concerns. It was felt that in order to raise the awareness of the role that environmental education plays in maintaining and improving our water resources and other associated natural resources that it warranted a priority of its own. We have identified many target audiences including: current and seasonal residents, new property owners, recreational users, lake and river associations, contractors, realtors, and students.
Assessment of lakes <1000 acres:

Hours

*GIS mapping, printing costs, mileage, equipment, staff-time, other	$9000 ($3000/county)
Educational activities,	
*newsletters	$3000 ($1000/county)
*Rivers and Lakes fair	$4800/Aitkin ($2400/year)
*radio advertising	$600 ($200/county)
total grant (two years)	**$75000**

*grant components

Approximate grant breakdown by county:

Cass	Crow Wing	Aitkin	
14000	9000	4600	(Phase I contract)
10000	10000	10000	(Phase II contract)
1000	1000	1000	
200	200	200	
3000	3000	3000	
Rivers and Lakes Fair (educational 2years)		4800	
28200	23200	23600	

TOTAL MAXIMUM DAILY LOAD (TMDL STUDY)
PROJECT INFORMATION

Project Title: Big Sandy Area Lakes Nutrient Impairment TMDL Study
Lake Assessment Unit IDs: Minnewawa (01-0033-00), Big Sandy (01-0062-00)
Impaired Uses: Aquatic recreation due to excess nutrients
Project Dates: Schedule included; April 1, 2008 – June 30, 2009
Requested Amount: $63749

Project Summary:

In 2006, Big Sandy and Minnewawa Lakes in Aitkin County were placed on Minnesota's 303(d) List of Impaired Waters, for aquatic recreation due to excessive nutrients. The data indicated that these lakes had total phosphorus concentrations in excess of the MPCA's state water quality narrative standard of 30 micrograms per liter for the growing season mean.

This project includes water quality and sediment monitoring, watershed and in-lake water quality response modeling, calibrating the modeling to the most recent monitoring data, reviewing the water quality goals for the lake, evaluating watershed control measures and in-lake management techniques for phosphorus load reductions, determining the margin of safety and specific waste load and load allocations for each source of phosphorus, and recommendations for implementation and compliance monitoring plans. The TMDL Report, stakeholder/technical advisory meetings and a training session will also be completed as part of this project.

BACKGROUND INFORMATION AND PROBLEMS

The Big Sandy Area Lakes TMDL study is located in north central Minnesota and extends across Aitkin, Carlton and St. Louis counties. Land use within the watershed is typical of what is found in north-central Minnesota. Forests make up approximately 63%, wetlands and water 21%, agricultural (pasture and cultivated land) 14%, and urban 2%. As land use affects water quality, it can be useful to divide the state into regions where the land use and water resources are similar. For Minnesota, this results in several regions referred to as "ecoregions", defined by soils, land surface

form, natural vegetation and current land use. The study area lies within the Northern Lakes and Forests Ecoregion.

Big Sandy Reservoir was formed by closure of the dam on the Sandy River in 1886. The watershed extends eastward from the Mississippi River about 26 miles and is about 18 miles wide in the north-south direction. Four main river systems constituting over 150 river miles contribute flow to Big Sandy Reservoir: West Savanna from the north, the Prairie and Tamarack River from the east and the Sandy River from the south. The Big Sandy Watershed has an abundant lacustrine resource with 49 lakes. In 2006, Big Sandy and Minnewawa Lakes in Aitkin County were listed on Minnesota's 303(d) List of Impaired Waters for aquatic recreation due to excessive nutrients. This work plan focuses on the impairments listed in Table 1.

Table 1 : Big Sandy Area Impaired Lakes

Reach	Description	Yr	Assessment Unit ID	Affected use	Pollutant or Stressor	Target Start	Target Completion
Minnewawa	Lake or Reservoir	02	02 01-0033-00	Aquatic Rec.	Phos. (Total)	2006	2011
Big Sandy	Lake or Reservoir	02	02 01-0062-00	Aquatic Rec.	Phos. (Total)	2006	2011

Big Sandy Lake

Big Sandy Lake is a reservoir system, with a large watershed and variable water flow that fluctuates from year to year. Big Sandy Lake and its watershed is a complex system, especially due to the large watershed size (672,452 acres) combined with the unique land use changes such as wetland drainage, agricultural conversion and shoreline development that have occurred since the late 1800's. This combined with the hydrology of the system and physical landscape (80% wetland) plays a large role in the quality of water. Water quality data collected in 2007 show a range of TP from 29 - 57 ug/L, chlorophyll ranges from 7 – 39 ug/L, and Secchi reading from 1.71 – 1.97 meters.

Minnewawa Lake

Lake Minnewawa is located in Aitkin County and is a large (2,451 acres) but extremely shallow lake (mean depth of approximately 8 feet). The landuse within the watershed is approximately 43% water and wetlands and 33% forested. The primary inlets to Lake Minnewawa are located on the northeast and southeast portions of the lake. The lake was sampled during the summer of 1993 by the Minnesota Pollution Control Agency (MPCA) staff and citizens. Water quality data collected during the study reveal a summer mean TP concentration of 52 ug/L, mean chlorophyll a of 22.7 ug/L and a Secchi transparency of 4.6 feet. The phosphorus and chlorophyll a values are higher than the range of values exhibited by reference lakes in the ecoregion, while Secchi is lower. These measures indicated eutrophic conditions.

- **<u>Lake Sampling</u>**

Water Chemistry monitoring will occur in early May and continue through September. Six lake sites (three on Big Sandy, two on Minnewawa, and one on Horseshoe Lake) have been assumed for this effort. Only surface water will be collected from Horseshoe Lake to characterize inflows to Minnewawa. Collecting water samples from the lake sites during the growing season (bi-weekly) from the surface, thermocline and hypolimnion (2 depths) and analyzing for TP, total dissolved phosphorus (TDP), and chlorophyll *a* (surface only). One or two volunteers per lake and an MPCA Technician will do this sampling.

Lake	Sample Event	Sample Locations	# of profile samples	Total Samples
Big Sandy	7	3	4	84
Minnewawa	10	2	4	80
Horseshoe	10	1	1	10

Tributary Samples

15 grab samples will be collected from each of the five tributary sites and analyzing for TSS, VSS, TP, TDP and turbidity between April and September. Janet will collect these samples.

Flow

Data will be collected to calculate flow at the outlet of Lake Minnewawa with a level sensor or level gauge from April through September. Continuous flow readings will also be collected at each of the tributary sites. S-3 automated site was removed due to previous bridge repair and is not planned for automated sampling. MPCA staff has discussed moving the site perhaps to County Road 62. Janet will download information from automated samplers. SWCD Staff will not be setting up the automated samplers or developing hydrographs.

Public Relations:

Monthly meetings (14) will be held in the watershed in locations that are easily accessible to the watershed residents. Preparation time, travel time and the actual meeting will be 6 hours per meeting and each meeting will involve two SWCD staff. This is a key component of the total project and its anticipated success.

Along with public meetings, there will be minutes, meeting notices, newspaper and radio announcements to communicate the efforts of the staff and citizens who are working on this TMDL. Another important educational task will be to keep the County Board informed and the Aitkin County Water Planning Task Force. It is estimated that an hour preparation time (GIS, power point, etc.) and an hour of presentation time will be needed for each local meeting.

The local GIS department will be asked to create maps and/or data to address questions and concerns. These may be very localized and detailed maps as compared to the watershed level maps that Barr has in their workplan.

ARCGIS is needed for the SWCD office computer to assist the local GIS department with GIS layer preparation. SWCD may export information to the GIS Department for printing on their plotter.

The SWCD Staff will keep the TMDL Project progress up-to-date on the SWCD and County websites.

Schedule

Year	2008	2009

Task	Quarter	1Q	2Q	3Q	4Q	1Q	2Q
Administration							
General project management, phone calls, etc.		[----------					-]
Annual and semi-annual reports to MPCA				x		x	x
Monitoring							
Sampling			[---------				]
Data Entry into STORET			[---------				]
Public Relations							
Meetings		x	x	x	x	x	x
Newsletters						x	

Summary: This Priority Concerns Scoping Document is an overview of priorities identified through the Water Planning efforts. Additional important issues will be addressed in the remaining portions of Aitkin County's 4th Generation Water plan.