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Phase IIA Final Report

**Lake Volney Improvement Project**

A MPCA Clean Water Partnership Project

Project # 2902

March 19, 1998 – March 18, 2002

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## **Background:**

The Lake Volney Improvement Project is a watershed implementation project sponsored by Le Sueur County. Lake Volney is a eutrophic 277-acre lake with a small agricultural watershed (1906 acres), located near the interface of the North Central Hardwood Forests and Western Corn Belt Plains ecoregions. The landscape is rolling to steeply sloping with interspersed poorly drained swales and sloughs. Historically, the watershed was covered with hardwoods and, upon settlement, cleared for agricultural use. The water quality of this lake has been degraded by man's activities over a period of decades.

Beginning in the late 1980s, concerned citizens and state/local government began working to make improvements in lake water quality. A Lake Assessment Project conducted by the MPCA was the first concerted effort that took place in 1987. Watershed assessment and ISTS work began in the early 1990s. Le Sueur County conducted a comprehensive Phase I Diagnostic and Feasibility study of the lake and watershed in 1995. The project objectives were to fully understand the cause-effect relationship between land use and lake water quality by determining watershed nutrient mass loadings and the down stream lake response. That effort led to the development of an implementation plan identifying strategies to reduce nutrient loading, which developed into the Lake Volney Improvement Project.

This report covers the first four years of the implementation project (i.e. Phase IIA). Many people and organizations have participated in this project, including the watershed landowners, Le Sueur County, SWCD, NRCS, MDNR, Lake Volney Lake Association, MPCA, and BWSR.

## Primary Action Items and Program Elements Narrative

GOAL 1: Coordinate the Watershed Activities that will occur on Lake Volney

### **1. Create and maintain a Resource Committee.**

This purpose of this committee is to assist in implementing the project workplan, overview of watershed activities and help direct future implementation goals. Four meetings were held during the Phase IIA timeframe.

December 21, 1998 Resource Committee Meeting held to overview the Phase I results and sequence the major implementation activities during the project term. Members of the Lake Volney Lake Association described the current state of degraded water quality in Lake Volney. They recalled how they used to enjoy "crystal clear swimming." Dave Schuler overviewed the Phase I diagnostic study. He reported on the "classic redox situation" in both the wetland of subshed 3 and in the lake sediments of Lake Volney. Lake Volney has [TP] around 170 ug/l, and when modeled without the internal load the lake would be around 80 ug/l. Hugh Valiant characterized the current fish community in Lake Volney. While the lake should be a bass-panfish lake, it currently has a high black bullhead population. Rough fish immigration into Lake Volney via Dora and Gorman Lakes is an issue. Gene Krautkramer described the agricultural BMPs being pursued in the Volney watershed. A focus on external load reduction as primary objective #1 in the near term was discussed and agreed to by the resource committee.

February 23, 1999 Resource Committee meeting held in Le Center. Committee structure/purpose discussed, along with purpose of workplan. Priority Implementation actions were discussed. Points of interest:

- ~ Cluster septic system on Brockway Beach
- ~Low interest loan funds available
- ~Wetland surveys occurring
- ~Mach property stabilization likely
- ~ Jerry Scheffert terracing
- ~Dredging of lake outlet
- ~Improve fish barrier
- ~Offer manure/soil testing

~Demonstration sites

May 22, 2000 Resource Committee meeting held in Le Center. Discussed grant payout upon approval of project workplan. Points of interest:

- ~Aeration downstream from wetland as proposed by Bill Thompson/Steve Mc Comas
- ~Dollars available for Rock Inlets
- ~Dollars available for soil grid sampling
- ~Secchi disk readings
- ~Importance of meetings/attendance

September 19, 2001 Resource Committee meeting held in Le Center. Review and revision of the project workplan discussed. The main objective of this meeting was to discuss the issue of the wetland in subshed 3. Consulting engineer Dave Schuler was present to recommend a 100-year flood elevation planning criteria ("worst case") for this project. Obvious constraints to the project such as tile outlet elevations (on the east side of the wetland) will need to be considered. Dave described the main objective is to stabilize the water elevation in the wetland, and thereby reduce phosphorus export from the wetland to Lake Volney\*. A list of potential permits was discussed (county, WCA, COE). Gene Krautkremer will survey elevations on the tile outlets.

\*Technical Note: This 80-acre wetland is an impacted shallow cattail marsh, with 2 main inlets that have been modified by ditching activities in the past. A road divides the pool at the west end of the wetland. There is some erosion along the western and southern shores of the wetland. The wetland itself exported about 560 kg of phosphorus during the 1995 monitoring year (26" of rainfall during the season). About 40% of that exported phosphorus was of the soluble variety.

\*\*It was anticipated that this committee would meet quarterly to provide guidance and support of the implementation plan. However, Le Sueur County was plagued by a series of employee turnover, with three different staff members holding the position of Project Coordinator. This inconsistency resulted in a lack of coherence and overall project management, and is ultimately responsible for not meeting the goals of the implementation plan.

## **2. Planning and Zoning (P & Z) and the Soil and Water Conservation District (SWCD) will coordinate watershed activities.**

An annual contract was established with the Le Sueur County Soil and Water Conservation District for a Watershed Specialist. This individual was responsible for contacting landowners to promote conservation practices and the implementation of BMP's within the watershed. The first contract was for fiscal year 1999, and a new contract was signed for each consecutive year, through the end of the Phase IIA timeframe.

**3. Administration and follow-up of workplan projects will be done by P & Z. The SWCD will oversee operation and maintenance of BMP's.**

An intern was hired to update map themes within ArcView GIS for the CWP projects. Data analysis included the following:

- ~ Digitize all septic systems that utilized SRF funds
- ~ Digitize all know Imminent Health Threat ISTS with CWP Watersheds
- ~ Digitize an indicator point to represent CWP project sites
- ~ Create a layer of currently enrolled CRP acres in the CWP watersheds
- ~ Update the feedlot inventory

This program did ultimately occur. However, staff knowledge of the ArcView program was very poor, resulting in data sets that are not useable, or that were misplaced or not saved correctly.

**4. Planning and Zoning will administer the SRF loans.**

The First National Bank of Montgomery administered the SRF Loan Program for the Lake Volney CWP. The loan amount of \$539,553.00 was at 2% from state to county, and 5% from the bank to the private individual. During this Phase IIA timeframe, \$50,612.00 was disbursed in the following categories:

Tillage Equipment: \$42,612.00

Shoreline Stabilization: \$8,000.00

It was anticipated that a significant portion of the loan funds be used for the proposed cluster septic system. However, this system was never installed, therefore utilization of the loan fund was much lower than initially anticipated.

**GOAL 2: Reduce Nutrient Loading from the Watershed**

**1. Wetland Restoration in Subshed 3**

The work on the wetland in subshed 3 began immediately. In November of 1998, Gene Krautkremer, Watershed Specialist from the Le Sueur County SWCD, was contacted by Alvin Brockway, partial owner of the lower wetland that would benefit from an enhancement. His interest was in the RIM program, but ultimately his property was not eligible. The SWCD continued to work towards wetland improvements with Kate Leinen, Local Water Management Coordinator for Le Sueur County. They contacted several landowners in subshed 3 that would be impacted by the larger wetland restoration.

Investigations continued into the potential for a wetland restoration in January/February of 1999 as staff studied the phosphorous information gathered from the 1995 Diagnostic Study as related to the wetland system. The Watershed Specialist met with George and Blanche Picka in February to discuss the impacts to their property should the wetland restoration take place. At this time, the SWCD also

worked with Steve Pany, a member of the Lake Volney Improvement Association, on a grant request to the USFWS for a wetland restoration.

The SWCD and Zone 10 Engineers prepared for and implemented a survey of the large wetland in late February to obtain cross sections/topographic information of the wetland, as well as the elevations of tile outlets and culverts. In late March, the survey results were compiled and several follow up meetings held to consider the options for water storage within the wetland and the potential impacts of enhancement to the surrounding landowners.

Additional work on the restoration slowed in mid 1999 as other watershed projects were taking place. In May, it was proposed that a dike be placed on the Don Gibbs' property to hold water back onto the wetland area. In November, Jeff Hedke with the BWSR evaluated the survey work done on the large wetland to determine the feasibility of creating a pond just south of the wetland outlet on Don Gibbs' property. In late December, 1999, it was proposed that a buffer be installed adjacent to the wetland at the Picka property to protect the wetland and also their property if water levels were raised.

No additional work was performed until late June, 2000 when the SWCD and Zone 10 Engineers performed a topographical survey of the Brockway/Gibbs wetland system to assess it for enhancement. Throughout this time, staff continued to research past studies done on wetland enhancements/restorations in an effort to gain more information that would assist in their efforts to complete a wetland restoration in the Volney Watershed.

In January/February 2001, a significant amount of time was spent on the proposal of excavating several small ponds within the large wetland system as an enhancement opportunity instead of a full-scale restoration. The idea was to create water storage within several smaller ponds, instead of creating one large open water area, to reduce nutrient transport out of the wetland. A meeting was held with all involved landowners on January 10<sup>th</sup>, 2001 .

In April/May 2001, additional survey work was performed by the SWCD and Zone 10 on the Brockway/Gibbs wetland system, and follow-up meetings held with PCA, LS County and the Lake Volney Association. The NRCS became involved with the enhancement, and engineer Steve Becker worked closely with SWCD staff in May/June on the proposed excavation of the Brockway/Gibbs' wetland.

Early July presented an opportunity for training in "Wetlands for Water Quality." In late July, August and September, the SWCD and Zone 10 Engineers performed additional survey work on the large wetland, this time extending the survey to include the upstream tributaries to the wetland and other adjacent land. A significant amount of time was spent analyzing the data as it became obvious that the large wetland area was very flat, indicating that raising water levels would likely result in a significant impact to those landowners utilizing the ditch system for their drainage networks.

Dave Schuler of Schuler Engineering became involved again in September of 2001. He utilized all of the survey data to conduct a Site Analysis, Mapping and Model Set-up, Model Calibration, Control Structure Hydraulics and Hydrograph Development. This work was centered on the proposal of a structure on Don Gibbs' property to hold

water back in the large subshed 3 wetland. The goal of this project was to create a long-term ponding area to reduce the growth and dieback of the wetland vegetation as it occurs during the current fluctuating water levels, thereby decreasing the associated flush of phosphorous from the wetland system.

Meetings continued between county staff, landowners, Lake Association, SWCD, PCA, USFWS, DNR, and the CRWP. In March of 2002, additional planning meetings were held with PCA, Dave Schuler and the SWCD, resulting in additional survey work with Zone 10.

No wetland restorations were completed during this Phase IIA timeframe.

\*\*An extensive amount of time and effort went into the pursuit of this wetland restoration. While the restoration never occurred, valuable information was collected and documented. This implementation item will not be ignored. Data show that restoring this wetland system is vital to the full success of reducing nutrient inputs to Lake Volney. Future efforts will most certainly return to these past collaborations and they will no doubt become an asset in any restoration attempt.

**2. Promote Cluster Septic Systems and up-grade of individual systems.**

A cluster septic system was pursued on Brockway Beach, on the south side of Lake Volney, as an alternative to individual systems because of small lot sizes. Interest in this type of project began in 1995. A septic system questionnaire was sent to residents of the Brockway Beach area in 1999. Interest at that time was split, and ultimately the system was never installed.

Le Sueur County enforces MN Rules 7080, requiring ISTS compliance when a property is sold or when a property owner needs a building permit. Le Sueur County Environmental Services staff routinely approve ISTS designs and perform inspections on new systems for compliance with county and state rules. 11 systems were installed during the Phase IIA timeframe, with two other existing systems receiving Certificates of Compliance. There are 67 total residents within the Lake Volney watershed, of which 52 exist on lakeshore.

YEAR	LAKESHORE NEW/UPGRADE	WATERSHED NEW/UPGRADE	CERTIFICATE OF COMPLIANCE(EXISTING ISTS)
1998	0/2	0/0	0
1999	0/4	1/1	1
2000	0/2	0/0	1
2001	1/0	0/0	0
2002	0/0	0/0	0

**3. Provide Manure and Soil Testing, and Implement General Ag BMP's.**

A significant number of BMP's were installed or attempted within the Lake Volney Watershed.

**BMP's Installed**

- ~ Alfred Scheffert installed six sediment blocks to reduce sediment and nutrient transport in subshed 10. The design work was done by the Watershed Specialist from the LS County SWCD. The project was completed with funds from the Cannon River Watershed Partnership.
- ~ Tom Gregor installed a terrace/diversion through his yard to divert clean water around his feedlot to prevent feedlot runoff. His property is located in subshed 2. This project was completed in cooperation with the SWCD and the County Feedlot Officer.
- ~ The Dollars for Phosphorous program was heavily promoted throughout the duration of the Phase IIA timeframe. Only two landowners took advantage of the program: Tom Gregor and The Cooney Brothers. Incentives were given for Gregor to haul manure out of the watershed, and for Cooney's to install a terrace.
- ~ A buffer was installed on "Elwood Corner" in subshed 10 by Roger Goettl. The purpose of this buffer was to slow water and trap sediment from the rolling agricultural land in this subshed. The Watershed Specialist aided in the design and implementation of the buffer.
- ~ The Goettl Farm installed two terraces to slow runoff and sediment transport in subshed 4. The Watershed Specialist aided in the design and implementation of this project.
- ~ John Cooney installed a terrace on his property to slow runoff and sediment transport in subshed 2. The Watershed Specialist aided in the design and implementation of this project.
- ~ A drainage tile serving subsheds 9/10 broke near the lake on the Trenda property in May, 2000. The tile was also blocked with tree roots, forcing the tile water overland, causing a severe washout. Retka Tiling was hired and new tile was installed under the road, all the way to the lake. No changes were made to existing surface flows. The project was also done to aid the increased flow from the sediment blocks on Alfred Scheffert's property. The Watershed Specialist aided in the design and implementation of the tiling project.
- ~ Several shoreline sites were assessed for erosion issues. The Watershed Specialist and Local Water Management Coordinator visited with landowners to determine their need for riprap. Dee Soulek, located at 19029 400<sup>th</sup> Street (North shore of Lake Volney) obtained a DNR Waters permit to install rip rap more than 5' waterward of the OHWM. The Watershed Specialist aided in the design of this project and several others, along with follow-up for proper installation.
- ~ A grass waterway was created on the Alfred Scheffert property in subshed 10 just prior to the start up of Lake Volney's Phase II Implementation project. The waterway was completed in coordination with the SWCD and cost share funds, and while not a direct result of the CWP project, it was a significant project benefiting Lake Volney.

\*See Figure 1 for map of installed BMP's

### **BMP's Attempted but not Installed**

- ~ Cyril Miller expressed an interest in buffer installation on his property in subshed 10. NRCS approved that his land qualified for the CRP program, but Mr. Miller was

not agreeable to the terms, and the buffers were never installed. The Watershed Specialist spent a significant amount of time in trying to persuade Mr. Miller to enroll his land in the program.

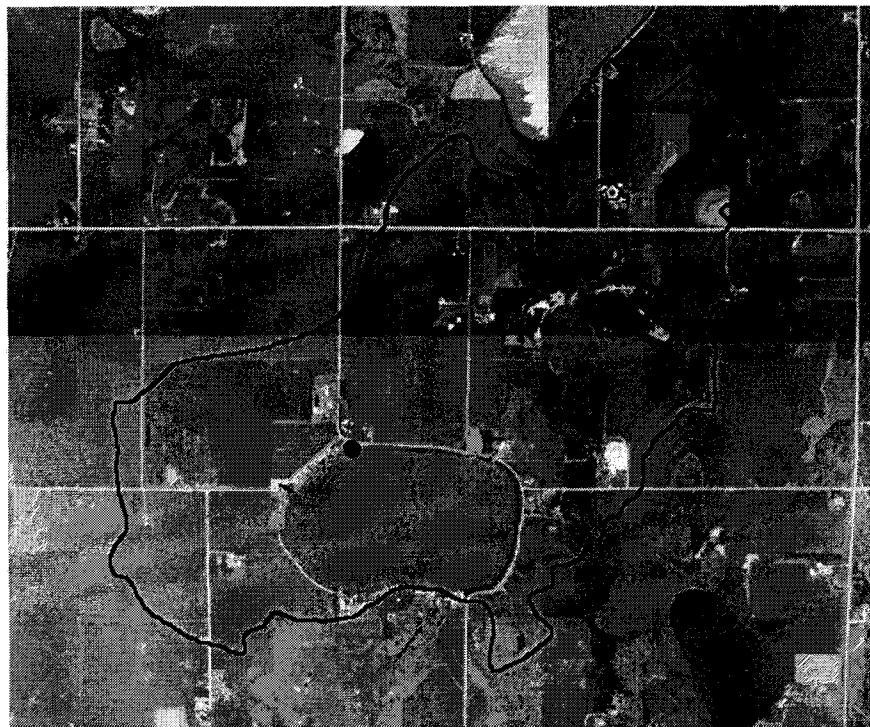
~ Rock tile inlets were heavily promoted throughout the Phase IIA timeframe. No landowners took advantage of this practice. The Cannon River Watershed Partnership made the funds available for this practice, so funds were limited and used up very quickly. Rock inlets work best on low ground in a basin. The Lake Volney Watershed is generally rolling to steeply sloping, with many terraces. These are not recommended for inlets on terraces or sediment blocks.

~ Grid sampling was heavily promoted throughout the Phase IIA timeframe. No landowners took advantage of this practice. Several of the producers already had this information from when they developed their manure management plans. There was also some fear of the information becoming public, as well as the fact that there are only a small number of producers within the watershed.

~ The Watershed Specialist worked significantly with Alfred Scheffert and Roger Goettl on options for improving the runoff and erosion issues between their agricultural properties, both located in subshed 10. A significant amount of survey work was performed across the existing grass waterway and up across the crop land to identify a location for storage or a sediment block with a tile. Neither property owner participated in a project of this kind utilizing CWP dollars.

~ Several attempts were made by the Watershed Specialist to enroll the Scheffert Farm in subshed 10 into the CRP program/Wetland Restoration/long-term easement. All attempts failed.

# Lake Volney Watershed - BMP's Installed 1998-2002



- ~ Don Gibbs contacted the Watershed Specialist to aid in the design and implementation of a yard diversion on his property in subshed 5 to divert runoff from the roofs of his feedlot buildings. This project never occurred.
- ~ The Watershed Specialist attempted to enroll Tom Gregor's property adjacent to the private ditch into CRP buffers in subshed 2. This project never occurred.
- ~ The Local Water Management Coordinator pursued the stabilization of shoreline sites using bioengineering practices. No landowners participated in this practice during the Phase IIA timeframe.

### **General BMP Promotion**

- ~ The Watershed Specialist drafted and sent numerous letters to landowners in the watershed outlining the various conservation programs available to them.
- ~ The Watershed Specialist and Local Water Management Coordinator worked with the local coops to promote the sale of phosphorous free fertilizer in area communities.

\*\*While several efforts were made to promote and install Best Management Practices in the watershed, acceptance and implementation of these practices was limited. Lack of guidance from a single Project Coordinator contributed to this scenario, as well as the fact that there are very few landowners in this watershed.

#### **4. Stabilization of Gully and eroding Banks – intermittent drainage channel (Subshed 7)**

This project occurred on the property owned by Harry Mach. This site was identified as having a severe erosion problem in the form of a large gully within a wooded ravine. An extensive amount of survey work was done by the NRCS and SWCD, as was the design for a grass waterway. Project implementation occurred during the fall of 1999. The area for the grass waterway was cleared/grubbed and graded to planned specifications. The waterway outlets to an existing pond through a rip rap outlet. A small sediment basin and terrace were constructed above the waterway, and tile intakes were added. All existing tile were hooked into the system for full treatment of runoff water in the sediment basin and ponds. The entire site was seeded and mulched. Barnett Brothers from Kilkenny, MN performed the work. In September of 2000, the pond was dredged to remove the silt/sediment that had been deposited.

### GOAL 3: Reduce Lake Sediment Nutrient Recycling

- 1. Plan to chemically treat Lake Volney in the near future if wetland restoration and watershed BMP implementation actions do not achieve adequate results.**

The major focus of the project has remained on watershed implementation. Planning did occur more fully in 2001 to address the inlake nutrient recycling that is occurring in Lake Volney. Recommendations from the Resource Committee led to the update of the project workplan to include an in-lake consultant. It was intended that this consultant would work within the project's existing structure to address internal nutrient loading and the biological interactions of the fish, algae and aquatic plant communities. It was planned to hire a qualified consultant in 2002, after the expiration of the Phase IIA timeframe.

Since the initial implementation plan was drafted in 1997, there has been some discussion related to the use of inlake chemical treatment or tributary inflow chemical treatment. Both of these actions are outlined in the project's comprehensive implementation plan.

The major focus of the Phase IIA workplan was "on the watershed." From our initial list of implementation actions, about 14 out of a total 24 deal with activities focused on the watershed. Although some of these have been started, none have been fully completed to date. The basic rationale is that we must focus first on watershed management, and implement common sense pollution reduction practices. Such practices can also improve the soil quality and help to develop a sustainable and functioning watershed. Without first adequately addressing watershed sources of nutrients, the usefulness of inlake actions will be decreased.

Prior to the drafting of the original workplan, a meeting was held on December 21, 1998 in Le Center to discuss these issues. It was determined that our initial implementation efforts should be focused on watershed sources of nutrients, especially those within subwatershed 3 and the large wetland. This was appropriate since the 1995 diagnostic study indicated that the majority of external loading was from subshed 3.

This approach did not mean that this project would not consider other water quality improvement alternatives in the future. It is known that there is significant internal recycling of phosphorus within the lake. This process has been accelerated from past watershed nutrient loading. An inlake treatment of sediment with a chemical compound such as alum

could reduce this recycling. The time frame for positive effects from such a treatment could be 10-15 years, but this depends on several factors. Some of these factors include external loading and internal biological processes. By reducing external loading, and attempting to increase the stability of the biotic communities in the lake, any inflake treatments will be enhanced.

The chemical treatment of tributary inflows was also suggested in the list of alternatives. The initial cost of this, at subwatershed 5, was estimated at about \$80,000. This alternative would also require extensive operation and maintenance costs on a yearly basis following initial construction. Although this option was not ruled out, it was less likely than a whole lake sediment treatment. The use of this approach in Minnesota has been very limited. Those systems that have been installed have been "off-line" treatment, that is, the chemical addition occurs in an area adjacent to the tributary, not directly in it. Waters are routed into the treatment area during higher flows, treated with an aluminum or iron compound to reduce phosphorus, and then routed back into the tributary channel. Such an approach would likely increase the cost of construction. Additional factors that are problematic for this approach include toxicity of the chemicals below the point of application, as well as the need to address all nutrient sources above the point of treatment before starting such a system.

Consequently, the appropriate sequencing of implementation activities for this watershed improvement project must occur. Our focus for this Phase IIA timeframe was to reduce nutrients from watershed sources first. In the future, we will strive to develop a deliberate and proactive implementation process, with adequate time allotted for communication.

## **2. Develop a Lake Management Plan**

A plan was not developed within the Phase IIA timeframe.

\*\*While this action was a part of the project workplan, it never gained the attention of a priority implementation item. Lack of consistency in staff commitment, because of employee turnover, was responsible for this item not being completed.

#### GOAL 4: Public Awareness of Water Quality Issues

**1. Planning and Zoning and Minnesota Extension Service will give an Ag BMP Demonstration.**

No demonstrations occurred within the Lake Volney Watershed within the Phase IIA timeframe. However, a demonstration of rock tile inlets vs. open inlets, and various tillage options was held in Lanesburgh township on Donald Eilers' farm, sponsored by the University of Minnesota.

**2. Planning and Zoning will conduct a presentation on septic systems for homeowners.**

Watershed residents were invited to a satellite conference presented by the University of MN Extension Service on Alternative Systems. No other presentations were conducted within the Phase IIA timeframe.

**3. Conduct Riparian BMP Fair.**

A fair was not held within the Phase IIA timeframe.

The above listed educational actions were never realized, again due to lack of staff consistency. Efforts such as these require extensive planning and coordination, both of

which were severely degraded when an existing staff member left and a new staff person was challenged with the task of taking over a project of which they were not familiar with. By the time this new staff member was able to make coordinated decisions, they abandoned their position with the County. It was this type of activity that consistently impeded the success of this project.

#### 4. Other Education

A presentation and discussion on aquatic plants was organized by the Local Water Management Coordinator. The meeting was held in Le Center on March 27, 2001, with a presentation by Dr. John Madsen from Minnesota State University, Mankato. This meeting was targeted to the Le Sueur County CWP projects, but was open to all interested citizens from the region. The title of the presentation was "Aquatic Plants: The Good, The Bad, The Exotic." Main topics for discussion included curlyleaf pondweed and eurasian watermilfoil. About 30 citizens attended the event.

A survey of Lake Volney landowners was conducted in 2001. Survey respondents ranked the following areas of concern: ISTS, water monitoring, tributary water quality, inlake water quality, farm BMP's, RIM/CREP, landscaping and aeration. Respondents ranked land set-aside programs and continued monitoring as being the most important. The data from the survey was used to revise the project workplan.

The Lake Volney Improvement Association held several meetings throughout the Phase IIA timeframe.

September 30, 1998 – LVIA meeting attended by county and MPCA staff. The current status of the Lake Volney Watershed Project was discussed, including a presentation of the draft Lake Volney work plan and sediment treatment potential. Fund raising options for the Lake Volney Association were also discussed.

October 21, 1998 – LVIA meeting attended by County staff. An overview of the Phase IIA project was given.

October 27, 1999 – County and MPCA staff attended the LVIA meeting to present information on project activities. Water sampling data collected from the 1999 season were presented.

July 10, 1999 – LVIA Annual Meeting. Attended by County and SWCD staff. An overview of the Phase IIA project was given, including staff involved, grant and loan awards, workplan implementation goals and primary action items, a review of past watershed efforts and expenditures and an outline of anticipated monitoring efforts for the 1999 season.

July 8, 2000 – LVIA Annual Meeting. Attended by County, MPCA and SWCD staff. Monitoring data from the 1999-2000 season was presented. Reference information was

provided regarding the Lake Volney watershed and lake statistics. Discussion centered on focusing on watershed projects to reduce the external load of phosphorous, including wetlands, farmlands and lakeshore areas. It was agreed that expensive in-lake treatment options should be addressed following the exhaustion of all watershed activities. Discussion of the sediment cores analyzed by Dr. Charles Umberhauer of St. Olaf resulted in a suggestion that he be invited to present his findings and learn how the information could benefit lake improvement efforts.

December 6, 2000 – LVIA meeting attended by County and MPCA staff to present information on project activities. The following items were discussed at the meeting: dredging of the Mach ponds; repair of tile blowout and a 0.5 acre buffer establishment at Elwood Corner; subshed 3 wetland; buffers on ditches and surface tile inlets; potential use of alum and aeration for inlake water quality changes; use of GIS for the project; aquatic plants in the lake and along shoreline.

April 4, 2001 – LVIA meeting attended by County and SWCD staff. Updates were provided on the progress of the sediment settling ponds for the wetland northeast of the lake and field grid sampling.

July 14, 2001 – LVIA Annual Meeting. Attended by County and SWCD staff. Discussion items included rough fish removal, fish barrier gate, shoreline/beach landscaping, aeration and alum treatment, aquatic plant management and promotion of ag BMP's.

**1. Continue lake and watershed monitoring program.**

**1998** – Sampling conducted by Schuler Engineering at watershed sites 1, 2, 3 and 5. Parameters included TP, TN, TSS, Total Nitrate, Soluble Phosphorous and Ammonia Nitrogen. These results were then compared to 1995 and 1997 findings. See Appendix A and B.

**1999** – In-lake and watershed grab samples collected by County and MPCA staff.

<u>Inflow Site 3</u>	<u>TP(mg P/L)</u>	<u>OP(mg P/L)</u>	<u>TSS(mg/L)</u>	<u>VSS(mg/L)</u>	<u>Turbidity</u>
27-April-99	0.150	0.08	4.60	3.40	ND
18-May-99	0.241	ND	36.0	4.00	11 NTU's

Inlake Site                      TP/Surface(mg/L)

TP/Deep(mg/L)

18-May-99	0.123	0.273
12-Aug-99	0.079	0.902

**2000** – Watershed grab samples collected by County staff.

<u>Inflow Site 3</u>	<u>TP(mg/L)</u>	<u>Solids/Mineral</u>	<u>(mg/L)</u>
<u>Solids/Organic(mg/L)</u>			
08-May-00	ND	23	9
11-May-00	0.607	38	8
19-May-00	0.269	56	8
02-June-00	0.363	75	11

Inflow Site 6

(Drainage Pump) TP(mg/L) Solids/Mineral (mg/L)

Solids/Organic(mg/L)

02-June-00	0.491	ND	ND
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**2001** – Watershed grab samples collected by county staff. No organized inflow sampling occurred due to erosion around the flume at inflow site 3. Efforts to organize the heavy equipment and materials needed to reinstall the flume were not successful.

Subshed 3

<u>Wetland Outlet</u>	<u>TP(mg/L)</u>	<u>OP(mg/L)</u>	<u>TSS(mg/L)</u>	<u>VSS(mg/L)</u>
30-Aug-01	1.37	0.211	470	160

<u>Inflow Site 5</u>	<u>TP(mg/L)</u>	<u>OP(mg/L)</u>	<u>TSS(mg/L)</u>	<u>VSS(mg/L)</u>
30-Aug-01	1.22	0.418	82	40

This monitoring showed a decline in suspended solids from up gradient to down gradient. However, total phosphorous remained the same, while ortho-phosphorous increased.

**2002** – No sampling occurred during the remainder of the Phase IIA timeframe.

**Parameter Key:**

TP: Total Phosphorous - Both particulate and soluble forms

OP: Ortho Phosphorous – Dissolved or soluble form

TSS: Total Suspended Solids – Both inorganic and organic material in suspension in the water column

VSS: Volatile Suspended Solids – The organic portion of TSS, which is of biological origin.

**2. Establish a citizen-based monitoring program**

1998 – Citizen lake volunteer: Gerald Bendzick – Secchi disk data from 17 occasions.

1999 – Citizen lake volunteer: Gerald Bendzick – Secchi disk data from 17 occasions.

2000 – Citizen lake volunteer: None

2001 – Citizen lake volunteer: David Flaherty – Secchi disk data from 17 occasions. These data show a significant decline in transparency from June to August.

2002 – Citizen lake volunteer: David Flaherty – Secchi disk data from 19 occasions.

\*See Appendix C

**Conclusion:**

\*\*Phase IIA of The Lake Volney Clean Water Partnership Project met with several obstacles in the form of employee turnover and a general lack of project guidance and coordination. For any project to be successful, it is critical that there be consistency in leadership and constant effort towards attaining the goals set forth.

However, this phase of implementation was not entirely a loss. Several BMP's were implemented, and a significant amount of information was gained through survey work, landowner communications and overall education of the citizens of this lake and its

watershed. Grant and loan dollars were utilized, all for the betterment of the water quality of Lake Volney. We may not have achieved all that was possible, but steps were made in the right direction. This is all we can ask for. Ultimately, the project was a success!

A **Thank You** goes out to all persons involved, including the landowners, local and state agency staff, for your tireless commitment and efforts towards improving this valuable water resource! It is each of you, in your own, way that has made this project possible!