Water Quality Assessment Plan For Pelican Lake

(18-03080)

January 28, 2005

Developed By:

PELICAN LAKES PROPERTY OWNERS ASSOCIATION (PLPOA)

A Citizen Volunteer Water Quality Monitoring Program
The Legislative Commission on Minnesota Resources (LCMR) recommended funding for this project from the Minnesota Environment and Natural Resources Trust Fund.

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Date Plan Completed:	1/28/2005
Organization Name:	Pelican Lakes Property Owners Association (PLPOA)
Name of Program:	Water Quality Assessment for Pelican Lake (18-0308)
Monitoring Plan Author(s):	Glen Gustafson, Joan Mondale, San Countryman, Ed Nordgaard, and Joe Hampl
Primary Contact:	Glen Gustafson
Address:	386 Ramsey Rd. Wayzata, MN 55391
Contact Phone:	(952) 476-7989
Contact email:	glengustafson@msn.com
Website (if any):	http://www.mnlakes.org/PLPOA/

The Legislative Commission on Minnesota Resources (LCMR) recommended funding for this project from the Minnesota Environment and Natural Resources Trust Fund.

The goal of this grant is to enhance and expand the ability of citizen volunteers to collect water quality data that will be useful for lake and stream assessments and management. Minnesota Lakes Association and Rivers Council of Minnesota, with assistance from River Network, will work collaboratively to provide training, technical support, education and communications for individuals and organizations statewide interested in citizen volunteer lake and stream monitoring.

Group Description

What is your group's mission?

Pelican Lakes Property Owner's Association (PLPOA) is dedicated to maintaining the environmental health of Pelican Lake and its watershed.

Geographical area covered:

Pelican Lake, Crow Wing County, Minnesota

Lake ID#: 18-0308

Upper Mississippi Basin

Pine River Watershed

Political Watershed: Thirty Lakes Watershed District (TLWD)

What type of organization are you? **Non-profit**

When was your organization founded/started? **1982**

# of members (if any): **205 paid members**

# of paid staff (if any): **None**

Introduction Narrative

This document contains a lake-monitoring plan for Pelican Lake in Crow Wing County, Minnesota. Members of the Pelican Lakes Property Owner's Association (PLPOA) developed this plan.

The purpose of the plan is to better understand the overall health of Pelican Lake and to investigate the perceived degradation of water quality. Environmental pressures on the Pelican Lake have never been more intense and it is critical to monitor the impact of the dramatic growth of the area. Does Pelican Lake meet our standards for a healthy lake?

Our process in accomplishing this objective is a structured monitoring plan. By using this plan, we hope to learn from its results what things we can all do to protect our lake and to prioritize our needs for additional monitoring of certain problem areas more often.

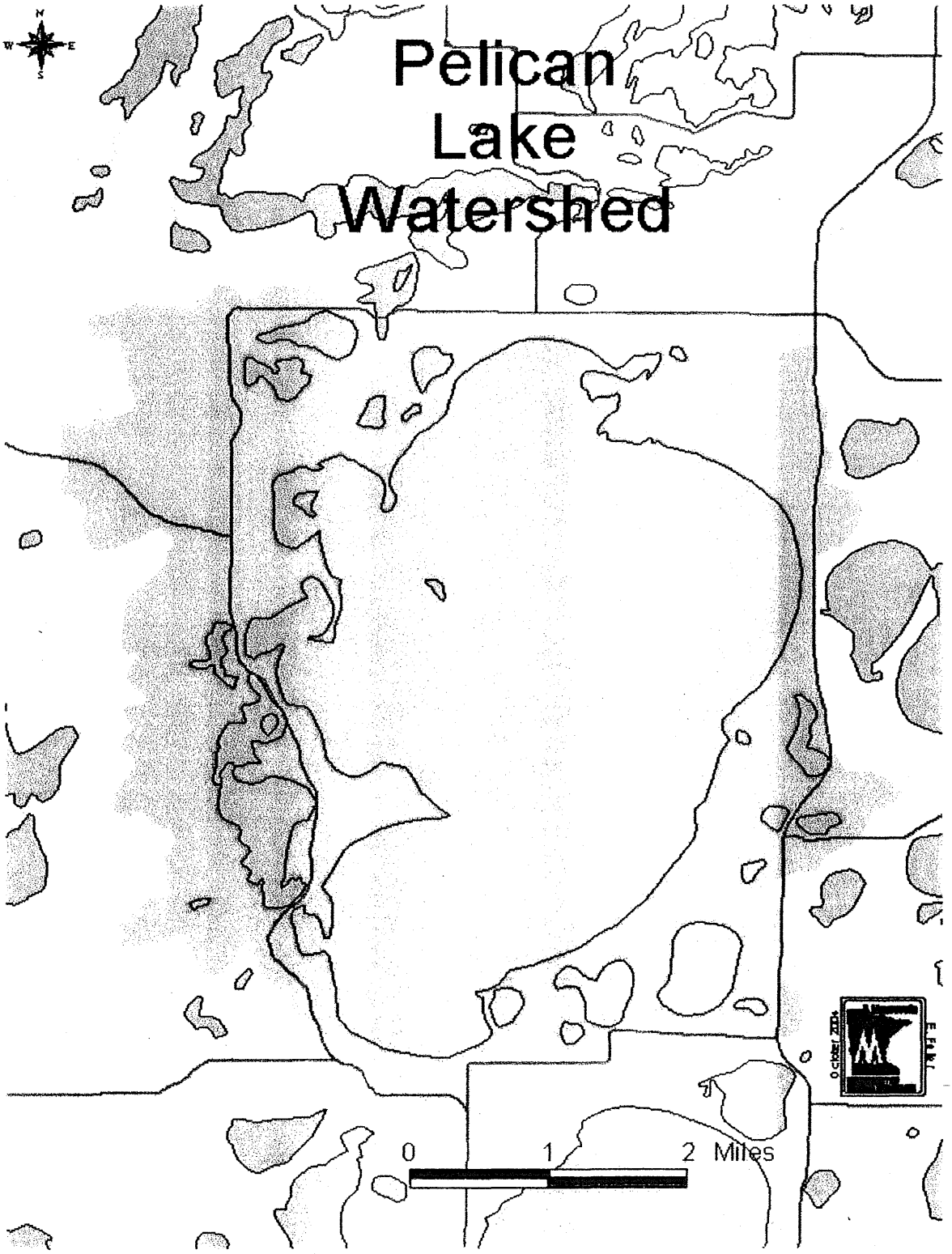
The Pay-Off for monitoring water quality on Pelican Lake will be the sharing of current information with lake property owners, other lake users, and our local watershed district.

The lake cannot defend itself in times of intense environmental pressures. The defense of the lake requires the grassroots effort of concerned and informed property owners and other lake users. Monitoring the lake is a great way for them to understand the pressures chipping away at lake water quality.

The ultimate goal of our plan is to preserve the quality of Pelican Lake for not only this generation, but for generations to come.

1.1 – Watershed Maps

Attached is a watershed map, supplied by the MN DNR with the waters of interest highlighted. **Watershed is marked in gray**.



1.2 - Watershed and Surface Water Information

Watershed / Water body of Interest:

INFORMATION ITEMS	ANSWER
Major Basin	Upper Mississippi
Watershed	Pine River
Eco Region	Northern Lakes and Forests
Water Location	Crow Wing County
HUC	7010105
Lake ID #	18-0308
Lake Surface Area	8253 Acres
Lake Maximum Depth	104 feet
Resorts	Breezy Point Resort (NW corner) Pelican Beach Resort (SW corner)
Outlets	Diversion Ditch to Lake Ossawinnamakee
Inlets	None

1.3 - Inventory of Watershed and Surface Water Uses

Watershed / Water body of Interest:

USES	ANSWER
Primary Water Uses	Recreational, Boating, Fishing, Swimming
Public Access/Locations	Boat Landing 1-Department of Natural Resources (DNR) 3-Crow Wing County 1-Private (Breezy Point Resort)
General Public Perceptions of Water	People find Pelican Lake very desirable for recreation and lakeshore ownership.
Data Collectors	Minnesota Pollution Control Agency (MPCA) Thirty Lakes Watershed District (TLWD) Pelican Lakes Property Owners Association (PLPOA) AW Research Labs (AWRL)

1.4 - Understanding State Standards that Define Your Water's Health

This worksheet uses information from: Chapter 7050 of the State Water Quality Standards, 305(b) Assessed Waters Report, and 303(d) Impaired Waters List to define the health of our water's health.

1) **Water body of Interest** (name, location, and/ or segment/ lake number)	2) **Use Classifications** WQS-7050	3) **Assessed?**	4) **Are there Uses that are Fully Supported?** 305(b) (List)	5) **Are there Uses that are NOT Fully Supported?** 305(b) (List)	6)**Impaired? If Impaired, what is the Affected Use?** 303(d)	7) **If Impaired, what is the Pollutant or Stressor?** 303(d)	8) **Streams: Does Ecoregion Data Indicate any Threats?** 305(b) (List)	9) **Lakes: What is the Carlson Trophic Status?** 305(b)	10) **Suspected Sources** 305(b) Your own experience
Pelican Lake 18-0308	2B, 3B, 4A, 4B, 5, 6 Warm Water Aquatic Life All Recreation	M	FS	No	Aquatic Consumption	Mercury Fish Consumption Advisory (FCA)	NA	**Total Phos 35 (Oligo)** **Secchi 39 Ft.(Oligo)**	Past or Present Waste Discharge

11) Values: Pelican Lake is a popular lake for boating, sailing, swimming, diving, fishing (winter and summer) and aesthetics. Pelican Beach and Breezy Point resorts line its shores. Many of its nearly 900 lake properties have been in continuous use for the past 50-75 years.

2. 1 - Issues, Efforts to Address Those Issues, Evaluation, & Outcomes

Issue, Monitoring Question or Hypothesis	Known Effort to Address the Issue	Evaluating Known Efforts	Identifying Niches for Citizen Monitoring	Desired Future Outcomes
What is the condition of our lake's water quality?	Our Association and TLWD is collecting data to evaluate.	Our task is to gather the available data, convert it to information, and disseminate that information to our public.	Continue to collect and evaluate data until we have enough information to identify the status of lake quality and trends.	Enough data will be collected to determine if our lake's water quality, is getting worse, getting better, or staying the same.
What is the source of recent elevated fecal coliform readings?	PLPOA has collected water samples. PLPOA and Thirty Lakes Watershed have conducted aerial assessments.	Known data is not sufficient to answer our question.	Continue to take water samples at known higher risk areas.	Bacteria sources are located and remediated.
Are there zebra mussels in Pelican Lake?	PLPOA put out tiles at designated areas around the lake. Presentation by DNR officials to property owners at recent annual meeting	No zebra mussels identified to date.	Property owners do visual inspections of docks, lifts and allow placement of tiles as required.	Prevention!

3.1 - Data Users and Data Uses

Question or Hypothesis	User/Decision Maker	Uses/Decisions	Potential Parameters
What is the condition of our lake's water quality?	PLPOA (Board and Membership) TLWD	If the lake is impaired or trends indicate that water quality is deteriorating, PLPOA will develop and implement a remediation plan that includes specific sources and develop strategies to restore lake quality in consultation with TLWD and DNR.	Secchi Disks Total phosphorus Chlorophyll A Aquatic Plant Mapping Periphyton Tiles Visual Assessment/Beach Walk (See note 1 Below)
What is the source of recent elevated fecal coliform readings?	PLPOA (Board and Membership) TLWD	If readings indicate elevated levels, we will use the data to pursue more investigation and remediate the problem in consultation with TLWD.	Fecal Coliform colonies Septic Surveys
Are there zebra mussels in Pelican Lake?	PLPOA (Board and Membership) DNR (PLPOA will receive report from DNR)	If found, communicate with DNR and notify the public.	Zebra Mussel Tiles

Note 1: Visual Observations of physical materials of concern found in water. Collected in sterile containers. Analysis dependant on nature of sample

4.1 - Monitoring Assessment

1. *Lake Condition and Trend Assessment at the Lake Scale*--
   We will be conducting a "direct data use" 305 (b) assessment, we are our own primary data user and our secondary data users are the Thirty Lakes Watershed District (TLWSD) and the Minnesota Pollution Control Agency (MPCA). We have very little data collected on our lake. We are collecting data primarily to assess its current condition for our own uses, but would like the MPCA to have it on record.
2. *Fecal Coliform Impact Assessment*--
   We will be using screening data use. We are our own primary data user. Our secondary data user is Thirty Lakes Watershed District.
3. *Potential Zebra Mussel Infestation Impact Screen*--
   We will be using visual observation of lifts, dock posts, other under water hard surfaces for the presence of zebra mussels. Tiles will also used to detect zebra mussels. Primary users will be PLPOA, TLWSD, and DNR

5.1 - Parameters

Parameters	Water Body Type
Fecal Coliform Bacteria	Lake
Secchi Disk	Lake
Total Phosphorus	Lake
Chlorophyll "A"	Lake
Zebra Mussels	Lake
Periphyton	Lake
Beachwalk (Visual Assessments)	Lake

5.2 - Sample Collection Methods and Sampling Quality Objectives

Parameter	Sampling Method & Source	Collection Equipment	Where in the Water Column?	Where Across the Transect?	Sample Storage Container & Preservation	Quantity of Sample Collected	Number of Samples Collected per Site
Fecal Coliform Bacteria	Standard Grab Sample	Sterile Sampling Bottles (200ml) provided by certified lab	12-18 inches below water surface	Epilimnion	Sterile Sampling Bottles (200ml) provided by certified lab stored at 4 degrees C	200 ml	1
Secchi Disk	Visual Observation CLMP+ manual	Secchi Disk	Epilimnion (Upper well mixed layer)	Maximum Lake Depth	NA	NA	Mean of two readings
Total Phosphorus	Integrated Depth Sample - CLMP+ Manual	Integrated Sampler	Epilimnion (Upper well mixed layer)	Maximum Lake Depth	1 Liter Acid-rinsed glass bottle, add H_2SO_4 to pH 2 at 4^0C	1 Liter	One
Chlorophyll "A"	Integrate Depth Sample - CLMP+ Manual	Integrated Sampler	Epilimnion (Upper well mixed layer)	Maximum Lake Depth	Kept in the dark at 4 degrees C	1 Liter	One
Zebra Mussels	Certified Lab (See Note 2 below)	Ceramic Tiles	6 inches below water surface	Within 200 feet of shoreline (5 foot contour)	Sterile containers provided by certified lab	Two tiles per site.	2
Periphyton	Tiles Certified Lab	Ceramic Tiles	6 inches below water surface	Within 200 feet of shoreline (5 foot contour)	Sterile containers provided by certified lab	Two tiles per site.	2
Beachwalk (Visual Assessments) (See Note 1)	Visual, property owner	Whirl Pack, Plastic bottle, (provided by certified lab), photos, other as appropriate	Variable	Variable	Whirl Pack, immediate transport to Lab within 6 hrs of collection.	Variable	1 per site

Representativeness: The columns of Sampling Methods, Collection Equipment, Where in the Water Column, and Where across the Transect describe the DQOs for each parameter, which in turn demonstrate how representative the samples are of the water body being monitored.

Comparability: To ensure comparability based on sampling, we will use standardized sampling procedures and documentation, provide volunteer training, and use only those trained volunteers.

Note 1: Visual Observations of physical materials of concern found in water. Collected in sterile containers. Analysis dependant on nature of sample

Note 2: Since we will put lab analysis out for quotes, we list only "Certified Lab" in the charts. We will know the specific lab name when the decision is made

5.3 - Analytical Methods

Parameter	Location of Sample Analysis	Maximum Holding Time	Analytical Method and Source	Reporting Units
Fecal Coliform Bacteria	Certified Lab*	6 Hrs.	Lab will analyze with their protocol.	Colonies per 100 ml.
Secchi Disk	Field	NA	NA	Feet
Total Phosphorus	Certified Lab*	28 days if preserved	Lab will analyze with their protocol.	Ug/L P
Chlorophyll "A"	Certified Lab*	Unfiltered 48 hrs /Filtered & Frozen 30 days	Lab will analyze with their protocol.	Ug/L
Zebra Mussels	DNR	6 Hrs.	Lab will analyze	Absent or Present
Periphyton	Certified Lab*	6 Hrs.	Lab will analyze with their methods	Grams
Beachwalk (Visual Assessments)	Physical samples will be taken to certified lab*, as appropriate	6 Hrs.	Visual Observations of physical materials of concern found in water. Collected in sterile containers. Analysis dependant on nature of sample. Lab will analyze with their methods See appendix A	As appropriate

* We will be asking for bids before choosing a certified laboratory.

5.4 - Data Quality Objectives for Own Analysis

Parameter	Description of Method	Accuracy	Precision	Detection Limit/ Measurement Range
Secchi Disk	In field analysis, visual observation	NA	+/- 0.2 m for duplicate readings by the same monitor as well as different monitors	DL=0.2m Range=0.2-10.0m

6.1 - Sampling Site List

Site #	Brief Description of Location (Code for Segment, if any)	Type of Site	Parameters
54	Breezy Point Bay	Impact	Fecal Coliform
501, 505	Mid Lake Sites	Condition and Trend	Secchi, TP, Chlorophyll 'a'
510	Gooseberry Island	Impact	Fecal Coliform
7,29,37,51,54, 70, 74,81,103,111 ,127,141,	Sites as marked (See Site Map attached)	Condition and Trend	Fecal Coliform
7,29,37,51,54, 70, 74,81,103,111 ,127,141, 510	Sites as marked (See Site Map attached)	Condition and Trend	Zebra Mussels
7,29,37,51,54, 70, 74,81,103,111 ,127,141, 510	Sites as marked (See Site Map attached)	Condition and Trend	Periphyton
As Found by Property Owners	Variable	Impact	Visual Observations of physical materials of concern found in water. Collected in sterile containers. Analysis dependant on nature of sample

Note: Specific GPS locations of sites will be recorded during first monitoring cycle in 2005.

Note: See Site Map Below.

6.2:

Site Map

Note Little Pelican Lake sites are not included in this plan. A separate plan will be developed in conjunction with the residents on Little Pelican Lake.

6.3 - Sampling Schedule

Parameter(s)	Frequency	Completeness	Time of Day	Time of Year	# of Years	Special Weather Conditions
Fecal Coliform Bacteria	2 impact sites monthly Other sites-1 sample during July	50% of samples	Daylight hours	July, August	On-going	Warm. After rain event as necessary
Secchi Disk	Monthly	Minimum needed (100% of the following) 1 sample/month/site 5 months (May-Sept)	10am-2pm	Growing season (May to Sept)	On-going	Bright, calm days
Total Phosphorus	Monthly	Minimum needed (100% of the following) -1 sample/month/site -5 months (May-Sept)	10am-2pm	Growing season (May to Sept)	On-going	Bright, calm days
Chlorophyll "a"	Monthly	Minimum needed (100% of the following) -1 sample/month/site -5 months (May-Sept)	10am-2pm	Growing season (May to Sept)	On-going	Bright, calm days
Zebra Mussels	Annually	80% of sites	N/A	July-August	On-going	N/A
Periphyton	Annually	80% of sites	N/A	July-August	On-going	N/A
Beachwalk (Visual Assessments)	All Year	N/A	N/A	On-going	On-going	N/A

7.1 - Quality Control Measures

Parameters	% Quality Control Samples							Evaluation
	Field Blanks	Field Dups.						
Fecal Coliform Bacteria	NA	As determined by certified lab						Performed by trained volunteers in the field. Analysis performed by certified lab using QC measures
Secchi Disk	NA	Each sample						Performed by trained volunteers in the field.
Total Phosphorus		As indicated by analytical lab						Sample analyzed by Certified Lab using QC measures
Chlorophyll "A"		As indicated by analytical lab						Sample analyzed by Certified Lab using QC measures
Zebra Mussels		100% of Sites						Performed by trained volunteers in the field. Analysis performed by certified lab using QC measures
Periphyton		100% of Sites						Performed by trained volunteers in the field. . Analysis performed by certified lab using QC measures
Beachwalk (Visual Assessments)		TBD						Performed by trained volunteers in the field. . Analysis performed by certified lab using QC measures

Response Action: If a response action is needed, we will define the problem and troubleshooting to determine the problem source. Once identified the problem will be resolved according to established guidelines.

7.2 - Instrument and Equipment Requirements

1) Equipment Type: Secchi Disk
2) Documentation: Instruction Manual
3) Inspection, Calibration, and Maintenance: Calibrate Secchi rope at the beginning of each season with tape measure to insure markings on rope are accurate. If not, replace and calibrate the new rope.

1) Equipment Type: Ceramic Tiles
2) Documentation: From Certified Lab
3) Inspection, Calibration, and Maintenance: Done by Certified Lab

1) Equipment Type: Sterile 200ml Bottles for Fecal Coliform sampling
2) Documentation: From Certified Lab
3) Inspection, Calibration, and Maintenance: Done by Certified Lab

1) Equipment Type: Integrated Sampler
2) Documentation: Manufactures Instructions. Vender to be determined
3) Calibration: None Required
4) Inspection: Check to make sure sampler is stored and cleaned as directed below:
Maintenance:

A. **Clean at the beginning of each sampling session. Dissolve 1/2 box of baking soda in a clean container with one gallon of water. Plug one end and fill 1/2 way with cleaning solution. Plug other end and rotate and tilt sampler to clean all surfaces, making sure not to touch internal surfaces of the sampler. Discard cleaning solution and repeat until all the cleaning solution is used. Rinse thoroughly 3 times with tap water.**
B. **Store dry when not in use with both ends covered with plug or clean plastic baggy and tape.**

Data Storage and Management

8.1 - Field and Laboratory Sheets

--Type of Sheet: **Field Data Sheet (Beachwalk/Visual Assessments)**

Copies Attached, See Appendix A

--Type of Sheet: **Field Data Sheet (Fecal Coliform, Phosphorus, Chlorophyll "a")**

Copies Attached, See Appendix A

--Type of Sheet: **Field Data Sheet (Secchi Disk)**

Copies Attached, See Appendix B

--Type of Sheet: **Field Data Sheet (Ceramic Tiles)**

Copies Attached, See Appendix C

Step 8.2 - Data Transfer, Entry, and Validation

This is the pathway each field and laboratory sheet follows from beginning, through data entry and validation to its final resting place and who has responsibility for each step.

Name of Sheet Or Database	Data Transfer	Data Entry	Validation	Final Resting Place
Secchi Disk Field Data Sheet	Field Sheets returned to Joe Hampl	Joe will enter field data into Excel spreadsheet	Joe will take laptop with Excel spreadsheet and Field Data Sheets to Joan's office for validation. Joe will make necessary corrections.	Hardcopies of field data and lab sheets are stored at Joan's house in a file box. Spreadsheet data is stored in organizations laptop, maintained by Joe.
Field Data Sheet (Fecal Coliform)	Field sheets accompany samples to lab where they are checked in and verified	Copies of lab results are mailed to Joe who will enter data into Excel spreadsheet.	Joe will take laptop with Excel spreadsheet and Field Data Sheets to Joan's office for validation. Joe will make necessary corrections.	Hardcopies of field data and lab sheets are stored at Joan's house in a file box. Spreadsheet data is stored in organizations laptop, maintained by Joe.
Field Data Sheet (Ceramic Tiles)	Field sheets accompany samples to lab where they are checked in and verified	Copies of lab results are mailed to Joe who will enter data into Excel spreadsheet.	Joe will take laptop with Excel spreadsheet and Field Data Sheets to Joan's office for validation. Joe will make necessary corrections.	Hardcopies of field data and lab sheets are stored at Joan's house in a file box. Spreadsheet data is stored in organizations laptop, maintained by Joe.
Field Data Sheet (Beachwalk-Visual Assessments)	Impacted Homeowner collects sample and completes data sheet, which is then delivered to certified lab.	Copies of lab results and Field Data Sheets are mailed to Joe who will enter data into Excel spreadsheet.	Joe will take laptop with Excel spreadsheet and Field Data Sheets to Joan's office for validation. Joe will make necessary corrections.	Hardcopies of field data and lab sheets are stored at Joan's house in a file box. Spreadsheet data is stored in organizations laptop, maintained by Joe.

8.3 - Miscellaneous and Problem Data

Explains how problem data, such as missing values, detection limit, nonsensical data, ranges, narrative, etc., will be handled (e.g. not entered, special characters, etc.).

Parameter	*Data Entry Protocol for "Problem" Data

***We will continue to fill in this worksheet as problem data occur.**

8.4 - Meta-data

(Modified from MPCA Volunteer Surface Water Monitoring Guide Appendix F) Checks in the columns indicate where the meta-data can be found. Blank rows indicate that meta-data element is not used.

Note: This information will be completed as we become more familiar with where the individual Meta Data elements are found.

PROJECT INFORMATION

Meta-data element	In the Monitoring Plan	On Field or Lab Sheet	In Data Entry Program	Other:
Project ID				
Project name	X	X	X	
Project purpose	X			
Start date	X	X		
Planned duration	X	X		
Lead organization name	X	X		
Project manager (with contact Info	X			
Other Contact (like MPCA rep, SWCD rep)	X	X		
Sampling personnel	X	X	X	
Sample medium	X	X		
Sample collection methods	X	X		
Equipment Used	X	X		
Field measurement methods	X	X		
Comments about data transfer, Submission	X	X		
Project Study Area	X	X		
Design & sampling frequency	X	X		
Programs associated	X	X		
Cooperating Org.	X			
QA plan summary/reference	X	X		

LABORATORY

Meta-data element	In the Monitoring Plan	On Field or Lab Sheet	In Data Entry Program	Other:
Lab ID				
Laboratory name (w/ address and contact info				
Citation for lab (Manual or Handbook).				
Parameter				
Sample fraction				
Reporting units				
Comparable standard method				
Field preservation method				
Detection limit				
Lab certified for parameter?				
Length of Analysis				
Temperature basis				

STATION INFORMATION

Meta-data element	In the Monitoring Plan	On Field or Lab Sheet	In Data Entry Program	Other:
Project station ID				
Related station				
Station name				
Station type				
Water body type (stream, lake, wetland)				
Station description				
Site ID				
Ecoregion name				
Travel directions				
Station latitude-longitude or UTM				
Geo-positioning method				
Datum				
Map scale				
Site lat-long				
State/county				
HUC code				
DNR Lake ID				
Habitat Type				

MONITORING RESULTS

Meta-data element	In the Monitoring Plan	On Field or Lab Sheet	In Data Entry Program	Other:
Station and site ID	X	X		
Date	X	X		
Time	X	X		
Station ID	X	X		
Site ID	X	X		
Activity ID, type and category	X	X		
Medium	X	X		
Sample depth	X	X		
Sampling personnel	X	X		
Activity comments	X	X		
Sample collection method and equipment	X	X		
Sample preservation				
Lab ID		X		
Lab sample ID				
Lab certified?				
Results		X		
Field/lab ID				
Lab Sample Temperature		X		
Remark codes				

OTHER

Meta-data element	In the Monitoring Plan	On Field or Lab Sheet	In Data Entry Program	Other:

9.1 Compare Your Data with Benchmarks

1) Parameter	2) Analytical Benchmark and Methodology You Will Use	3) Who Will Analyze the Data?	4) Do the Data Users Require this Protocol?
Fecal Coliform Bacteria	**Benchmarks:** Water Quality Standards (WQS) ≤200 Organisms/100ml **Methodology:** WQS Step 1: % exceedence of 200 orgs/100ml. If ≥10% exceed, then move to next step. Step 2: # of months w/geo mean >200 orgs/100ml OR % exceedence of 200 orgs/100 ml	Certified Lab	Yes
Clarity (Secchi Disk)	**Benchmarks:** NLF Reference Lakes: 8-15 ft **Methodology:** Calculate the summer mean and compare with the %iles of the reference lakes in our ecoregion.	PLPOA	No
Total Phosphorus	**Benchmarks:** NLF Reference Lakes: 0.014-0.027 mg/L **Methodology:** Calculate the summer mean and compare with the %iles of the reference lakes in our ecoregion.	Certified Lab	No
Chlorophyll "A"	**Benchmarks:** NLF Reference Lakes: 4-10 ug/l **Methodology:** Calculate the summer mean and compare with the %iles of the reference lakes in our ecoregion.	Certified Lab	No
Zebra Mussels	**Benchmarks:** Present or Absent **Methodology:** Ceramic Tiles, Visual Observations from Public	Samples will be taken to DNR for identification and confirmation	Yes
Periphyton	**Benchmarks:** To be created as database is collected, none available at this time. **Methodology:** To be determined at a latter date by analytical lab.	Certified Lab	Yes
Beachwalk (Visual Assessments)	**Benchmarks:** None (varies according to analysis of sample) **Methodology:** Once sample is analyzed, we will attempt to place it in one of the other listed parameters. Other parameters may need to be identified, i.e. Oil Contamination.	Certified Lab as appropriate	Yes

9.2 Data Interpretation and Assessment

Decide how you will develop findings and conclusions

1) Questions Used to Develop Findings and Conclusions	2) Potential Statistical Summaries	3) Potential Data Displays
Single Parameters		
How do the results of each parameter's mean compare to ecoregion guidelines?	Calculate seasonal means for all parameters and see where they fall in the ranges for our ecoregion.	Column graph for each site including ecoregion guidelines for visual comparison.
Are Zebra Mussels present or not?	Summary of sites that are either Positive or Negative.	Table with results from each site.
Did the Secchi disk data analyzed exceed the maximum or minimum levels in the water quality criteria? If so, when, where, and how often.	Calculate maximum for parameters that are "not to exceed" and minimum for parameters that are "not less than".	Column graph for each parameter.
What is the change in Periphyton biomass per site?	Calculate the difference in Periphyton biomass at each site from year to year. Looking for significant changes in future.	Chart showing the change in weight at each site from year to year.
Did property owners make use of Beachwalk program?	Track number of samples obtained and analysis results	Chart showing numbers of samples and analysis

4) Describe how you will develop conclusions.

We will develop our conclusions by comparing our findings over both time (each site over time) and space (various sites to each other). We expect to do this on an annual basis and will include our conclusions in the technical report. However, we see a circumstance where conclusions might not be annual:

1. If there is a reason to draw attention to preliminary findings in the middle of a monitoring season (results of observations by property owners).

As appropriate, we want to share information as outlined in worksheet 10.1, reporting, presenting, and planning for change.

5) List Quality Control Questions you will ask about your data to determine if it can support your findings and conclusions.

1. How many samples were taken at each site? Did they meet the quality requirements we set?
2. Were samples collected at the right time of day? Were samples collected within the time period specified by the lab? Were samples collected through the whole sampling season?
3. Were the data checked against the field notes?
4. Did the data checker find any transcription errors?

10.1 - Reporting, Presenting, and Planning for change

1) Who will be responsible for preparing the reports and presentations?

Pelican Lakes Property Owners Association (PLPOA) - Water Quality Committee.

2) – 4):

2) What formats will be used to tell your story?	3) Target Audiences	4)	Raw data	summarized data		Interpreted data	photos	maps	illustrations	stories	Other:
				tables	graphs						
Technical Report	PLPOA Board, TLWSD		X	X	X	X	X	X	X	X	X Recommendations
Newsletter/Brochure/Website	PLPOA Membership				X	X	X	X	X	X	X Recommendations
Power Point Presentation	PLPOA Board, Membership, TLWSD				X	X	X	X	X	X	X Recommendations

DNR will be providing us a report on zebra mussel results.

5) Where/When will message be delivered?

Water Quality Chair will present results as part of the Annual Meeting agenda, including power point presentation. Information will also be shared in Newsletters and Website.

6) What would you expect to happen as a result of your report or presentation?

Lakeshore owners will take appropriate action to apply findings to their property and lifestyle. Report will also generate renewed interest in environmental issues effecting Pelican Lake and its watershed.

11.1 - Task Identification and Timeline

Monitoring Goal or Assessment (optional): *Water Quality Assessment for Pelican Lake* Dates Covered by Timeline: ***Jan 2005-Dec 2006***

Target Start Date	**Target End Date**	**Main Category** (Planning, Training Monitoring, etc.)	**Task / Activity Description**	**Person(s) Responsible to Organize/ Evaluate**	**Notes of Resources Needed to Carry-Out Task**	**Fill in Date** When done
1/10/05	3/1/05	Planning	Get quotes for lab services from area certified labs	Joan Mondale	Check for volume discounts Talk to Lab clients	
1/10/05	1/15/05	Planning	Order 2 Secchi Disks with Instructions	Ed Nordgaard		
2/10/05	4/10/05	Planning	Prepare Field Notes for collecting Secchi Disk data	Ed Nordgaard	See notes from distributor, workshop	
1/10/05	2/10/05	Planning	Prepare Field Notes for property owners on process for collecting and transporting spot samples (Whirl-Pacs)	Joe Hampl	Print 1000 copies	
2/10/05	3/1/05	Planning	Get "Whirl-Pacs" from lab	Joe Hampl	1000 units	
2/1/05	2/28/05	Planning	Prepare site maps for fecal Coliform/TSI sampling	Glen Gustafson	See 2004 notes, GPS coordinates, location descriptions	
2/1/05	2/28/05	Planning	Prepare monitoring schedule for TSI, Surface Sampling, and Tile placement	Glen Gustafson		
2/1/05	2/28/05	Planning	Prepare Field Data Sheets for collecting surface samples (Fecal Coliform)	Joe Hampl	Check w/Certified Lab	
4/1/05	4/15/05	Planning	Arrange with lab to place and collect Tile (ZM, Periphyton)	Joan Mondale	See notes from 2004	
4/1/05	4/15/05	Training	Train volunteers in use of GPS to mark and locate sampling locations	Joe Hampl		

Target Start Date	Target End Date	Main Category (Planning, Training Monitoring, etc.)	Task / Activity Description	Person(s) Responsible to Organize/ Evaluate	Notes of Resources Needed to Carry-Out Task	Fill in Date When done
3/1/-5	3/31/05	Planning	Arrange for GPS units for use by each sample collection team	Joe Hampl	Borrow units from Joan, Mark, Joe, & ? (one GPS per sampling team)	
3/1/05	3/31/05	Information to Action	Prepare article for Spring 2005 newsletter to update progress of monitoring effort	Jim Strampe	Prior to sample collection	
9/15/05	9/30/05	Information to Action	Prepare article for Fall 2005 newsletter	Jim Strampe	End of monitoring cycle report	
4/1/05 & 10/1/05	4/15/05 & 10/15/05	Information to Action	Prepare dedicated newsletters for mailing: --Print and collate --Print labels --Apply labels, postage, mail	Jim Strampe Joe Hampl Jim Strampe	500 copies	
6/15/05	6/31/05	Information to Action	Prepare After Action Report presentation for annual meeting 2006	Ed Nordgaard Joan Mondale Mark Henderson	Power Point presentation, handouts	
1/10/05	1/31/05	Data to Information	Arrange for MS Office Suite 2003 software for Board, Committee use to communicate from various locations during monitoring cycle	Mark Henderson San Countryman	$500 Includes Word, Power Point, Excel, Access	
5/10/05	5/20/05	Data to Information	Prepare presentation for full PLPOA Board Spring 2005	Ed Nordgaard Joan Mondale Mark Henderson	Prior to sharing w/membership	
10/1/05	10/15/05	Data to Information	Prepare presentation to Thirty Lakes Watershed District Fall 2005	Ed Nordgaard Joan Mondale Mark Henderson	End of Cycle report	
2/1/05	12/31/05	Data to Information	Prepare informational articles for PLPOA website- What can property owners do to improve water quality	Ed Nordgaard Joan Mondale Mark Henderson Kelly Anderson	Ongoing, beginning in Spring 2005 Include Beach Cpts.	
4/1/05	5/10/05	Communication & Management of Volunteers	Identify and train volunteers on surface sampling techniques and use of Field Data Sheets prior to sample collection (Winter, Spring 2005)	Ed Nordgaard Joan Mondale Joe Hampl Glen Gustafson		

Target Start Date	Target End Date	Main Category (Planning, Training Monitoring, etc.)	Task / Activity Description	Person(s) Responsible to Organize/ Evaluate	Notes of Resources Needed to Carry-Out Task	Fill in Date When done
4/15/05	10/1/05	Monitoring	Collect surface samples as per schedule	Ed Nordgaard Joan Mondale Mark Henderson Joe Hampl		
4/15/05	10/1/05	Monitoring	Take Secchi readings as per schedule and site plan	Ed Nordgaard Joe Hampl		
4/15/05	10/1/05	Monitoring	Collect TSI samples as per schedule and site plan	Joan Mondale		
7/1/05	8/31/05	Monitoring	Place/Retrieve Tiles as per schedule, site plan	Glen Gustafson		
3/1/05	4/15/05	Data to Information	Develop plan for gathering data obtained from lab, field notes, and sampling and assembling into database (Access or Excel)	Mark Henderson Joan Mondale Ed Nordgaard		
6/1/05	10/15/05	Data to Information	Perform Data Validation, Analysis and Interpretation	Ed Nordgaard Joan Mondale Mark Henderson		
10/1/05	11/1/05	Evaluation	Evaluate monitoring plan at end of cycle (Oct 2005)	Water Quality Committee, PLPOA Board		
1/10/05	12/31/05	Evaluation Planning	Prepare file of "Lessons Learned" for preparation of next monitoring cycle (2006).	Water Quality Committee, PLPOA Board	Use feedback from Data Users Ongoing process of note taking	
7/1/05	7/31/05	Monitoring Training	Distribute Whirl-Pacs and Field Data Sheets to membership at Annual Meeting July 2005 (Consider earlier meeting on Memorial Day weekend to extend monitoring season)	Joe Hampl	Use Beach Cpts. to help get packets to additional property owners	

11.2 - Volunteer Monitors Contact Information

Name	Address	Phone	Email	Sites Monitored/ Other Notes
Glen Gustafson	386 Ramsey Rd. Wayzata, MN 55391	(952) 476-7989	glengustafson@msn.com	
Joan Mondale	27646 County Rd. 4 Pequot Lakes, MN 56472	(218) 562-5371	Mondale@tds.net	
San Countryman	3725 Lenox Street Milwaukee, WI 53207	(414) 481-2075	Countrymanks2@aol.com	
Ed Nordgaard	12 Silvermine Woods Wilton, CT 06897	(203) 762-2972	ednordgaard@cs.com	
Joe Hampl	27117 Pelican Lake Rd. Merrifield, MN 56465	(218) 963-3982	jhampl@uslink.net	
Mark Henderson	2229 Ponderosa Dr. SW Rochester, MN 55902	(507) 280-6538	mhenderson@chartermi.net	
Dr. Gerald Smieja	9039 Breezy Point Dr. Breezy Point, MN 56472	(218) 5624123	TBD	Secchi Monitoring at site 205
Judy Mellinger	695 16th St. SW Rochester, MN 55902	(507) 282-7159	jnmellinger@charter.net	

11.3 - Committees and Data Users Contact Information

Committee: PLPOA Water Quality Committee:

Name/ Organization	Address	Phone	Email	Area of Expertise for committee
Judy Mellinger	695 16th St. SW Rochester, MN 55902	(507) 282-7159	jnmellinger@charter.net	Sample collection, contact with labs, coordination of volunteers
Ed Nordgaard	12 Silvermine Woods Wilton, CT 06897	(203) 762-2972	ednordgaard@cs.com	Experience working with governmental agencies
Joan Mondale	27646 County Rd. 4 Pequot Lakes, MN 56472	(218) 562-5371	Mondale@tds.net	Organizational Skills

Committee: PLPOA Communications Committee:

Name/ Organization	Address	Phone	Email	Area of Expertise for committee
Mark Henderson	2229 Ponderosa Dr. SW Rochester, MN 55902	(507) 280-6538	mhenderson@chartermi.net	Web Site, Brochures
Dr. James Strampe	4656 Ellerdale Rd. Minnetonka, MN 55345	(952) 936-0167	strampe@mn.rr.com	Newsletter
Joan Mondale	27646 County Rd. 4 Pequot Lakes, MN 56472	(218) 562-5371	Mondale@tds.net	Media

Data Users:

Name/Organization	Title, if applicable	Address	Phone	Email
Dick Beeson Thirty Lakes Watershed District	Chairman, Board of Managers	P.O. Box 376 Brainerd, MN 56401	(218) 828-0243	http://www.lakeswsd@brainerd.net/
Glen Gustafson PLPOA	President	P.O. Box 823 Nisswa, MN 56468	(218) 963-3982	http://www.mnlakes.org/PLPOA/
Tim Brastrup MN DNR	Area Fisheries Manager	1601 Minnesota Drive Brainerd, MN 56401	(218) 828-2552	Tim.Bastrup@dnr.state.mn.us

11.4 Over-all Budget

1) Revenues:

Item	*Description*	*Budget*
MLA/RCM Monitoring Plan	Grant (One time only)	$3000.00
PLPOA	Annual Donation	$500.00
Membership Donations	Individual Contributions for Monitoring	$500.00
	TOTAL REVENUE	**$4000.00**

2) Expenses:

Type of Expense	*(unit price)*	*(number of units)*	*Total Budget*
Certified Lab Analysis Costs			
--TSI	$270.00	2 Sites	***$540.00**
--Fecal Coliform (Certified Lab)	$30.00	19 samples	***$570.00**
--Tile Study (ZM & Periphyton)	$75.00	13 Sites	***$975.00**
--Visual Observation Samples	$500.00	TBD	***$500.00**
Printing Monitoring Plan	$15.00	15 Copies	***$225.00**
Postage	$3.00	11 reports	**$33.00**
Equipment Costs (Secchi Disks)	$20.00	3	***$60.00**
Software (MS Office 2003 site license)	$1500.00	1 Site License	**$1500.00**
Monitoring Program Letter of Introduction (Printing/Postage)	$0.51	450	***$229.50**
Water Quality Report Mailing/Printing	$0.79	450	***$355.50**
Conference Calls	$60.00	TBD	**$60.00**
Training, Water Monitoring Workshops	$200.00	TBD	***$200.00**
Brochures, Lake Stewardship	$1.50	1000	**$1500.00**
Integrated Lake Sampler	$30.00	1	***$30.00**
TOTAL EXPENSES 2005			**$6778.00**

3) Balance: *---(expected revenue minus expected expense)* **-$2778.00**

* Represent our priority items. We will seek sponsors or additional donations to supplement the budget.

4) In-Kind Contributions:

Item	*Description*	*Value*
Volunteer Hours	5 Persons X 80 Hrs X $17.25/Hr. 9 Persons X 40 Hrs X $17.25/Hr.	$13,110.00
Donated Supplies	Boat Gas for collecting samples	$50.00
Mileage	Seminars, trips to lab, meetings	$400.00
	TOTAL IN-KIND VALUE	**$13560.00**

12.1 - Follow-up

Group/Audience	*How Follow-up will happen:*	*Schedule*
PLPOA Board	Send monitoring plan and report	Ongoing during cycle
PLPOA Membership	Newsletters (2) Formal presentation at Annual Meeting Reports published on PLPOA Website	Spring, Fall July On Going
TLWD	Formal presentation Copy of final report	Fall 2005 Fall 2005
DNR	If reports indicate problems, ask advice on what to do If reports indicate problems, ask for evaluation of program and need to continue	Each year after we receive their report on zebra mussels

12.2 - Evaluation

Annual Evaluation Components	*Questions to Ask:*	*Tools used for evaluation*
Data Use	Did the data collected and reported answer our questions as to what is the health of our lake?	Conversations with data users Results of water analysis
Monitoring Plan	Re-evaluate monitoring plan at end of 2005 sampling season.	Read through plan to determine areas needing revision, clarification (Lessons Learned)
Volunteer Management	Were volunteers comfortable with the training and feedback process. Are we satisfied with their participation?	Conversations with volunteers. Follow up phone call in February 2006.
QA/QC	Is the quality of our monitoring data still meeting our data user's needs?	Conversation with our data user's

3 to 5 Year Evaluation Components	*Questions to Ask:*	*Tools used for evaluation*
Monitoring Plan	What parts worked? What Parts need updating? What changes are necessary?	PLPOA Board to review plan.

Where will the results of the evaluation be stored/accessed?

The Water Quality committee chair will store both the digital and hard copies of the evaluations. Additional copies will be stored with the PLPOA secretary.

Appendix A: Field Data Sheet for Fecal Coliform, Phosphorus, Chlorophyll "a"& Beachwalk Assessment Samples.

Select One:
Fecal Coliform _____
Visual Observation _____
Phosphorus _____
Chlorphyll "a" _____

PLPOA
Field Data Sheet

Date: _____
Name: _____
Phone: _____

Site #	Sample #	Time of Day	Way Point	GPS #	Conditions	Notes

12/22/2004

Page 1

Appendix B: Field Data Sheet for Secchi Disk Readings.

PLPOA
Field Data Sheet
Secchi

Name:	
Lake Name: Pelican	
Date:	
Time:	
Depth (feet)	**Temperature C**
1-10	
10-12	
12-14	
16-18	
18-20	
20-22	
22-24	
24-26	
26-28	
28-30	
30-32	
32-34	
34-36	
Lake Bottom Depth (ft):	

Lake ID#:
Site#:

Secchi Disk (ft):

Physical Condition:
1. Crystal Clear
2. Some Algae Present
3. Definite Algae Green
4. High Algal Color
5. Severe Bloom (Sums,Odor)

Recreational Suitability:
1. Beautiful
2. Minor Aesthetic Problems
3. Swimming...Slightly Impaired
4. No Swim....Boat OK
5. No Swim and No Boat

Field Observation Notes:

Appendix C: Field Data Sheet for Tiles.

PLPOA
Tile Field Data Sheet

Date:_____
Name:_____
Phone:_____

Date Placed	Date Removed	Tile - Tin #	Location #	GPS#	Location Description	Notes

Budget Request Form

A. Group Name: **Pelican Lakes Property Owners Association (PLPOA)**

B. Fiscal Agent: (Name/Address/Phone of
Person responsible to receive/handle funds:
San Countryman
Treasurer
Pelican Lakes Property Owners Assoc.
P.O.Box 823
Nisswa, MN 56468
Winter phone: 414 – 481-2075
June – August: 218-963-4490

C. Name that should appear on the check
Pelican Lakes Property Owners Association

D. Amount requested $3000

E. Budget from Step 11:

- Please copy your budget from worksheet 11.4 and paste into this form. Attach worksheet 11.5, if used. Then, finish filling out the columns to the right and email back to RCM/MLA as your budget request.
- The expense table below also asks you to identify those items of the budget that will be paid for with these funds (which part of your plan will be implemented) and specific estimates of what specific items will cost.
- The expense table also asks the time frame that funds will be used in – which will determine when you will receive them. We will distribute funds up to three times different times, depending on when you expect to spend them. Before we can distribute additional funds, we must receive all receipts back from the current spending period. For large expenses such as lab fees or equipment purchases, we need invoices before we can distribute the funds. This is because RCM/MLA are not reimbursed until we have all receipts. (All funds must be used by December 1, 2005.)

Revenues:

Item	*Description*	*Budget*
MLA/RCM Monitoring Plan	Grant (One time only)	$3000.00
PLPOA	Annual Donation	$500.00
Membership Donations	Individual Contributions for Monitoring	$500.00
	TOTAL REVENUE	**$4000.00**

2) Expenses:

Type of Expense	*(unit price)*	*(number of units)*	*Total Budget*
Certified Lab Analysis Costs			
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TOTAL EXPENSES 2005			**$6778.00**

3) Balance: *---(expected revenue minus expected expense)* **-$2778.00**

* Represent our priority items. We will seek sponsors or additional donations to supplement the budget.

4) In-Kind Contributions:

Item	*Description*	*Value*
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Donated Supplies	Boat Gas for collecting samples	$50.00
Mileage	Seminars, trips to lab, meetings	$400.00
	TOTAL IN-KIND VALUE	**$13560.00**

Expenses:

Type of Expense	*(Unit price)*	*(Number of units)*	*Total Budget*	*Budget for LCMR Funds Only Through RCM/MLA*	*Receive Money for these items:* ***April 1, '05.*** *Turn in all these receipts:* ***June 30, '05***	*Receive Money for these items* ***July 1, '05.*** *Turn in all these receipts* ***Sept 30, '05***	*Receive Money for these items* ***Oct 1, '05.*** *Turn in all these receipts* ***Dec 1, '05***
15 printed copies of this plan. Copies of the 2004 water testing results/analyis for 1/15/05 PLPOA Board meeting. 3 Tyvek report covers ($7.49) for water monitoring plan (for submission to MLA)		15 copies of water monitoring plan. 9 copies of other water testing reports	$225				**262.50 ck#439**
Water Quality Report in newsletter form to public		Water quality report printed, mailed in June 2005	$355.50				**458.26 ck#448**
Lab fees for analysis costs Fees for reporting		Chlor a, phosphorus, fecal , periphyton/ mussels	$2585				**$3264** **Ck#470 $120** **Ck#472 $120** **Ck#473 $384** **Ck#468 $150** **Ck#479 $450** **Ck#478 $120** **CK#481 $120** **Ck#483 $250** **Ck#482 $600** **Ck#484 $950**

Training, workshops		2: Drowning in lakeshore development 1: Data Assessment 1: Shallow Lakes	$200				**$ 115 ck#475 $30 ck#474 $30 ck# 469$10 ck# 465 $45**
Water Testing expenses		Pd. for boat gas					**$71.67 ck#460**
Education materials		DNR brochures-distributed in mailing and at launches					**$12.00 ck#463**
TOTAL EXPENSES 2005			**$ 361.25**	**$**		**$**	**$4183.43**

November 11, 2005

Ms. Sandy Holm
Minnesota Lakes Association
17021 Commercial Park Dr. Ste.4
Brainerd, MN 56401

RE: Pelican Lakes Property Owners Association (PLPOA) Final Report

Dear Sandy,

On behalf of the PLPOA Board of Directors, we want to thank MLA, RCM, RN and the LCMR for the opportunity to participate in the Citizen Volunteer Water Quality Monitoring Program. We appreciate your help and guidance over the last year. Please find below our final summary report with the results of the 2005 summer water- testing program.

Approximately 75% of the funds were spent on costs directly related to water testing, lab analysis and reports. The remaining balance was used for training seminars, educational materials and communications (newsletter) to community members and lake residents. The additional expenditures not covered by the $3000 grant will be handled by PLPOA, financial contributions of members of our association as well as in-kind donations.

The results received to date indicate that the TSI readings are fairly consistent when compared to previous years. We did extend the testing season this year to include both May and September; those months were not previously recorded. In addition, we expanded our testing area from 1 to 3 sites. Our plan initially called for two but we added the third location as Pelican's size and shape supported the need for a third site. This is the first time that the northern part of the lake has been tested for TSI and only the second year for the midsection. As for the fecal samples, majority of results came in lower than the set threshold, which is great news as we have found higher concentrations in the previous two years. The biomass /zebra mussel tiles were placed and removed as planned but the results are still being evaluated by the lab. There were no particular areas of concern that warranted more explicit exploration; therefore, we did not use any of the budgets for our Lake Watch/Beach Walk program. Overall, we have not noted major changes in the composition of the water but again, much of the lake was tested for the first time so we must continue our efforts to make a true determination of the health of the lake.

Joan Mondale 27646 County Rd 4 Pequot Lakes, MN 56472

As noted above, we are comparing this year's results to previous years to look for trends or changes. Since most of the testing was not conducted previously, we are capturing the data and creating a database to allow us to define benchmarks for future comparisons.

In summary, we are pleased with our efforts of the last few months. Once we are in receipt of all of the data, our Water Quality Committee will meet to evaluate the results and to conduct a "cost-benefit" analysis. The intent is to learn from our successes and failures and modify the plan as needed. The 2006 monitoring plan will then be finalized and presented to the PLPOA Board for final approval.

It is the intent of our association to continue with the water quality monitoring plan. Our members and the community understand and appreciate the value of such endeavors and fully support the program.

If you have any questions on our efforts or this report, please contact Joan Mondale at 218-562-5371 or mondale@tds.net.

Sincerely,

Joan Mondale
PLPOA

Pelican Lakes Property Owners Association

Summer Newsletter 2005

Water Quality Edition

Annual Meeting Set – *We hope to see you all at the Annual PLPOA Meeting, scheduled for* ***Saturday, July 9th*** *at the Breezy Point City Hall. The meeting will be from* ***9:00am – 11:00am*** *and will consist of a short business meeting followed by informative speakers addressing such interesting topics as water quality in Pelican Lakes ,commercial development on Pelican Lakes, and the new sanitary district. Coffee and breakfast rolls will be provided.*

Well Water Testing Available – Individual testing will be available again this year and kits will be obtainable at the annual meeting. It is easy and inexpensive (last year $20) and we will be providing drop off sites for your samples. You will receive informative reports by mail. Judy Mellinger is coordinating the testing.

Board Meeting (June 4, 2005) Notes – 1. The Lands End Pelican Lakes logo shirts will be available to order at the Annual Meeting. 2. Also at the meeting we will be voting on the By Laws Revisions recently mailed to all of you. 3. The newsletter mailing list is now up to 440 individual households plus about 60 various agencies and businesses. 4. We now have 226 actual paid members and about 140 of them include email addresses. 5. We have increased membership from 173 to 226 this year. 6. Now you can check the mailing label of your newsletter to see your membership status and most recent renewal date.

Lake Ossie, Zebra Mussel, Boat Inspection Update – As you are probably aware, extremely invasive zebra mussels have been found in Lake Ossawinnamakee (see previous newsletters). It is imperative that we do everything possible to prevent the spread and one of the most important actions we can take is inspections of boats as the enter and leave the lake. The DNR is expending significant efforts to help neighboring lake associations with regard to teaching people to perform these inspections and to teaching boaters to inspect their own boats. The following is a story from the Brainerd Dispatch (6/1/05) about the first inspection training meeting. Of the 40 plus people trained were about a dozen PLPOA board members and members at large. We will be working at the Ossie Public Landing on August 6th doing inspections and teaching. Another training meeting is planned for Thursday, June 30th, 5-6pm at Breezy Point City Hall for those interested in attending.

Reprinted from the Outdoors Editor, Brainerd Dispatch

BREEZY POINT -- As invasive species spread to more Minnesota waters, boaters are asked to take a proactive approach to keep the lakes clean.

Forty-two people, including representatives from seven area lake associations, gathered May 21 at Breezy Point City Hall to learn how to inspect boats for invasive species. The goal is to prevent what happened on Lake Ossawinnamakee two years ago -- infestation by zebra mussels -- from happening again.

The snail-like critters are Public Enemy No. 1 these days, but the list of invasive species found in Minnesota waters also includes Eurasian watermilfoil, round goby, ruffe, spiny wateflea, white perch, purple loosestrife and curly leaf pondweed.

"It's fine to hand out brochures and post signs at boat ramps, but it's better to have people talk to boaters when they come off the lake," said Molly Zins, communications coordinator for the Minnesota Lakes Association.

Members of three of the lake associations represented at the meeting have volunteered to inspect watercraft this summer at the Ossawinnamakee ramp. Others will patrol ramps on their own lakes.

Proper protocol for inspecting boats includes a friendly approach.

"Don't assume anybody's guilty," said Heidi Wolf, DNR watercraft inspection coordinator. "That puts them on the defensive right away. And don't touch their boat or crawl underneath it."

Wolf recommended that two inspectors work together at each site. "Not only are two sets of eyes better than one," she said, "but you'll have somebody to talk to while you're standing around."

More training sessions might be scheduled in the near future, Zins said, and boaters who use Ossawinnamakee are encouraged to wash their boats after leaving the lake.

"We were pleased with the turnout," Zins said of the first meeting. "We heard from our contacts that a lot of folks aren't up (to their cabins) yet. So we're shooting for another meeting some time in June or July."

Check your boat

All boaters should do the following when they come off the water:

-Check boat and trailer for weeds and remove them.

-Drain water from livewells, baitwells, transom and bilge area.

-Dispose of unused bait on shore.

-Wash the boat before taking it to another lake.

-If boaters performed these tasks every time they came off a lake the spread of invasive species would lessen, said Heidi Wolf, DNR watercraft inspection coordinator.

VINCE MEYER can be reached at vince.meyer@brainerddispatch.com or 855-5862.

PLPOA Water Quality Report – The following report has been prepared for this newsletter by Board members Ed Nordgaard and Joan Mondale who along with Board Member Joe Hample have worked countless hours in workshops learning to prepare and institute the recommendations of such a report. We all owe them our thanks.

PELICAN LAKE PROPERTY OWNERS ASSOCIATION

May 27, 2005

PLPOA WATER QUALITY PROGRAM

The Pelican Lakes enjoy the reputation of being among the cleanest lakes in Minnesota. Water pollution and non-native invasive species have been discovered in many other area lakes. Key components to keeping our lakes healthy include prevention, early detection and immediate intervention to address problems. Your lake association is committed to implementing and managing a lake monitoring plan to accomplish just that. And thanks to your support and involvement we will be successful in our efforts!

As reported in our 2004 Winter Newsletter, fecal coliform was discovered at the southwestern shoreline in Pelican Lake in 2003. This discovery triggered water sampling and infrared aerial photos to determine the extent and locations of this pollution. While nature (flocks of large birds) can cause fecal coliform, the number and location of the findings indicated the possibility of some faulty septic systems. This discovery prompted your Association (PLPOA) to initiate an extensive water sampling program in 2004. The purpose was to determine the current water quality status of Big and Little Pelican. It will take several years to get a good indication of the overall status, so this will be a long-term project. Experts have advised that it will take generations and considerable dollars to reverse the pollution in some of the lakes in Minnesota, including some in Crow Wing County. Therefore, PLPOA will be proactive in monitoring the water quality in the Pelican Lakes.

Our objective is to complete the current assessment of the water quality and take immediate corrective action when needed. Then PLPOA will continually monitor the lakes on an annual basis and implement special studies as needed. While there is a cost to monitoring the status and taking corrective action, we trust property owners agree this plan is essential to maintain the beauty, desirability and value of our Lakes.

2005 Water Quality Program -

This spring, we obtained and compared competitive bids for testing and analysis from several full service, certified laboratories. A.W. Research Laboratories was chosen based on price and services offered.

A brief overview of the projects included in the 2005 Program approved by your Board is:

PROJECT	PURPOSE	ACTION				WHO PAYS
		WHEN	WHERE	WHAT	BY WHOM	
1. Shoreline Testing	Fecal Coli, etc.	July (+ Adhoc)	Our 2 Lakes	30 Samples	PLPOA	PLPOA
2. TSI Reading	Water Quality	Summer	Big Pelican-3spots Little Pelican-1 spot	Sample,Analyze & Compare	PLPOA	PLPOA
3. Zebra Mussels	Identify if in Pelicans	Summer	A # of Docks On our Lakes	Attach Board to Docks	PLPOA	PLPOA
4. Well Water (Voluntary)	Potable Water Quality	July	Individual Homes	Test drinking water	Property Owners	Property Owners
5. Beach Walk	ID possible problems	As often as necessary	Shoreline or in lake	Abnormal conditions	Property Owners	Test/Analyze PLPOA

The 2005 program was designed to comply with Water Quality Monitoring Guidelines sponsored by the Minnesota Lakes Association (MLA) and the Rivers Council of Minnesota (RCofM). PLPOA participated in this program and was awarded a grant, as described in the Winter Newsletter. To view the plan in it's entirety, log on to our website, www.mnlakes.org/PLPOA. In an effort to comply with the requirements of the grant, (and to reduce costs) the majority of the sampling will be conducted the PLPOA Water Quality Committee (WQC).

Comments concerning these 2005 Water Quality Projects are:

1. Shoreline Testing –

a. In July 2005, water samples to measure fecal coliform and suspect plant samples will be taken at about 30 locations on both Big and Little Pelican. This continues our annual sampling program to identify any "hot spots", record current readings and track year- to-year short and long- term trends.

b. This process will be started on the front end of the ideal testing time to allow time in the event additional testing/observations are required at certain locations. The goal is to have necessary on-shore verifying and correction process completed before the end of this summer.

c. If problems are detected, the appropriate agency will be contacted for assistance. (Thirty Lakes Watershed District (TLWSD), DNR, MCPA, etc.).

d. The normal reading for our lakes is 4 or less with a reactionary point of 20. Any scores of 20+ will trigger additional investigation in that particular location of the lake.

e. Causes of slightly elevated scores may be seagulls, geese, or runoff, etc. Scores registering 200+ MUST be tested again immediately following the initial sampling. Continued high readings have to be reported to TLWSD and the MCPA immediately.

2. TSI Readings – 5 times a Summer at 4 Locations –

a. TSI is an important indicator of water conditions and these readings are used by a number of agencies including the MCPA, TLWSD, etc.

b. TLWSD has established acceptable or "normal" levels of TSI for each lake in our watershed. Samples taken from the lakes are compared to these figures to determine whether or not they fall within the acceptable range. The TSI goal for Pelican is 40.5. The TSI goal for Little Pelican is 41.3.

c. One time each month May through September, PLPOA will sample 3 sites on Big Pelican and 1 on Little Pelican. Comparisons will be made to previous year's results and shared with the appropriate agencies.

d. Big Pelican – In previous years, sampling was done at only 1 site at the south end with a second site added mid-lake in 2004. In view of its size and varying conditions around the lake, it was recommended we add a third site to evaluate the water in the northern portion.

3. Zebra Mussel & Biomass (Periphyton)Testing –

a. The discovery of Zebra Mussels in Lake Ossawinnamakee has heightened our concern. As a result, we initiated sampling for these Mussels in 2004. Ceramic tiles will once again be placed strategically around the lakes on volunteer's docks in late June and will be removed for analysis late August.

b. The required action to prevent Zebra Mussels from entering our Lakes would be to inspect all watercraft entering our public landings, which is virtually impossible. But we need to effectively communicate to homeowners the need to properly inspect their boats anytime they trailer boats from another lake to Big Pelican or Little Pelican.

c. Once identified, appropriate action can possibly contain but not eliminate them, unless the entire lake is purged of all living creatures, including fish!

d. While the tiles are in place, it is natural for them to collect nutrients/periphyton. So we will once again have the periphyton analyzed upon removal to measure the nutrient flow in the area. After we have collected three years of periphyton data, we will have a statistically credible baseline for future comparisons. If there is a significant increase in weight, it will signify the need for further exploration.

4. Well Water Testing –

a. As a service to Lakeshore owners, we are again sponsoring a voluntary well water sampling at discounted costs. Keep your family healthy by having your drinking water regularly checked for bacteria and nitrates. Pick up your sampling kits at the Annual Meeting the morning of the July 9th at the Breezy Point Community Center for only $20. Samples are to be returned that day to several locations (to be announced) around the lakes by 4:30pm, or you may return it directly to the lab yourself.

5. Beach Walk / Lake Watch –

a. No one knows our lakes better than those of us that live and recreate on them! Therefore, PLPOA is asking for your participation in our new Beach Walk – Lake Watch program.

b. All you need to do is keep your eyes open for abnormal water conditions or unusual plant life either in the lake or along the shoreline. If you discover something questionable, fill out the Beach Walk form (to be distributed later), take a picture of the questionable area, then contact a PLPOA board member to assist you in obtaining a sample for analysis.

2005 COSTS –

a. In 2004, our Water Quality expenses were close to $6,000. Our 2005 Program will not be any less. If pollution is discovered as it was in 2003 on the SW shore, considerably more expense could be incurred. Prompt action is necessary to contain any pollution and keep the costs down.

b. As announced in the Winter Newsletter, PLPOA was awarded the Grant of up to $3,000, administered by MLA and RCofM. PLPOA members must do the sampling for each of our projects to be eligible for reimbursement.

c. Unfortunately, the grant will not cover the total expenses and annual dues will not make up the difference. Please consider contributing to the PLPOA Water Quality Fund so we

can continue to do what we can to maintain our two Lakes. Donations are now tax deductible, with all checks made out to PLPOA. We appreciate your continued generosity in supporting our efforts!

2004 Water Quality Program Results –

There were a complex set of environmental measurements generated during the summer of 2004 using a set limit parameter (fecal coliform) and a relatively new qualitative measurement (biomass tile study). In addition, PLPOA authorized a TSI, winter sampling, and a well water study. Detailed results and copies of reports for all of these tests are located on our website at www.mnlakes.org/PLPOA.

2004 Weather Conditions were Unusual-
Conditions in 2004 were unusual with low air and water temperatures. There was little rain and therefore little runoff to further contaminate the lake water.

The 2004 Results are as follows:

Shoreline Testing - This study was done in late July. The water samples were collected at 27 locations on Pelican Lake and 12 locations on Little Pelican and were evaluated for fecal coliform.

a. Most samples were within the acceptable range. Many were extremely low (less than 4), we had a few in the 20s and we had one 40 and one 50.
b. It has been suggested that a common factor in an elevated bacterial count in a specific location may be the seagull population in that area. We are considering a seagull watch to determine whether this is a correlation.
c. You may remember in our testing 1 1/2 years ago some areas of the lake had very high bacterial levels, some of which we did trace to problems with leaking septic systems. Homeowners were very prompt in repairing the systems.

TSI –

a. TSI data came from two sources in 2004. TLWSD conducted testing at one location in Pelican and one in Little Pelican. Both of which were completed without any cost to PLPOA. PLPOA hired U of M Extension Corps to test a second location north and east of Lincoln Point in Pelican.
b. Results for Pelican fell within acceptable levels as determined by TLWSD. Clarity levels were much higher than normal with the July level reading of 26 feet!
c. Results for Little Pelican also fell within acceptable levels as determined by TLWSD. Clarity was also normal.

Zebra Mussel & Biomass (Periphyton) Tile Study –
This study is a new technique used to qualitatively identify the areas of the lake generating more nutrients that grow more periphyton than other areas of the lake. Small tiles were placed on docks and buoys in generally the same areas as the Shoreline (Fecal) Study.

a. No zebra mussels were found, and the periphyton buildup was reported to appear to be within normal levels. But 3 years of data is required before we can confidently identify what is "normal".
b. However, the laboratory conclusions included the comment that there "should be a level of concern with any amount of buildup".
c. Please refer to zebra mussel article elsewhere in this newsletter, and in previous newsletters.

Winter Water Testing -

a. In March 2004, water samples were taken every 20 feet at the deepest spot in Pelican, which is about 100 feet.
b. After reviewing and graphing previous data the total phosphorus appears to be within the ranges previously observed. The chloride concentration was also similar to that observed in 1992.
c. However, the nitrates tripled to quadrupled in magnitude from their previous concentrations observed in 1984, 1989 and 1992.
d. The other anions analyzed bromide, fluoride, nitrite, ortho phosphate and sulfate serve not only as a measured parameter but as a base line measurement for future comparisons.
e. Alan Cibuzar, President of AWRL, made a full presentation of this final report at the PLPOA Meeting May 29th, 2004. The report is available for review on our website.

Well Water Study - 35 residences were sampled around the lake.

a. 27 samples were absent for Coliform Bacteria and contained less than 1.0 mg/L for Nitrate Nitrogen.
b. Four samples were absent for Coliform Bacteria and had Nitrates ranging from 1.17 to 5.42, all of which were below the Public Health Service Limit of 10 mg IL.
c. Four samples had Coliform Bacteria present and were unfit for human consumption. The laboratory recommended that those four water supply systems should be disinfected and retested.
d. Should a system contain both bacteria and high nitrates (we had none) the septic system should be inspected.

Zebra Mussels in the Great Lakes – (The full article is available on our website.)
Led by zebra mussels, a host of invasive species is wreaking ecological havoc in Lake Michigan according to a December 18, 2004 article in the Milwaukee Journal Sentinel. The ecological cost might prove incalculable. Invasive mussels are now being linked to everything, including a collapse of the bottom of the Great lakes food chain to the noxious weedy sludge along Wisconsin's Lake Michigan shoreline to an explosion in toxic algae blooms across the region. Zebra Mussels were discovered in 1988 in the Great Lakes. Most of the public welcomed the subsequent increase in water clarity attributed to the mussel, mistakenly believing that clearer means cleaner. Ironically, the clearer water allowed a new crop of sunlight dependent plants to grow on vast expanses of the lake bottom. One such algae, called cladophora, eventually die and wash ashore and decompose in a stew that stinks like sewage.

Prefix Clean Wash System – Rob Birkeland, of the Larson Birkeland Team of Shores and More Real Estate reports that a local group has been organized to market and place in use a system for washing boats as they enter or exit our local lakes in an effort to control the spread of aquatic nuisance plant or animal life. The system is being marketed in several states. As has been reported previously in our PLPOA newsletters, the only truly effective method of controlling such problems would have to include high pressure, hot water washes and that is what the Prefix Clean Wash System does.

It is a self-contained transportable system that will be placed and set up at a water access site. The system includes a wash platform with an incorporated water collecting basin design. There are side fold out clean water tanks that are plumbed to two outboard spray towers and to the platform spray nozzles.

It is a drive through system that captures the water used and its contaminants, that are cleaned off the watercraft hull and trailer. With the use of an issued swipe card an electronic network authorizes the wash cycle. Cards can be issued by the resort owners, or regulatory agencies.

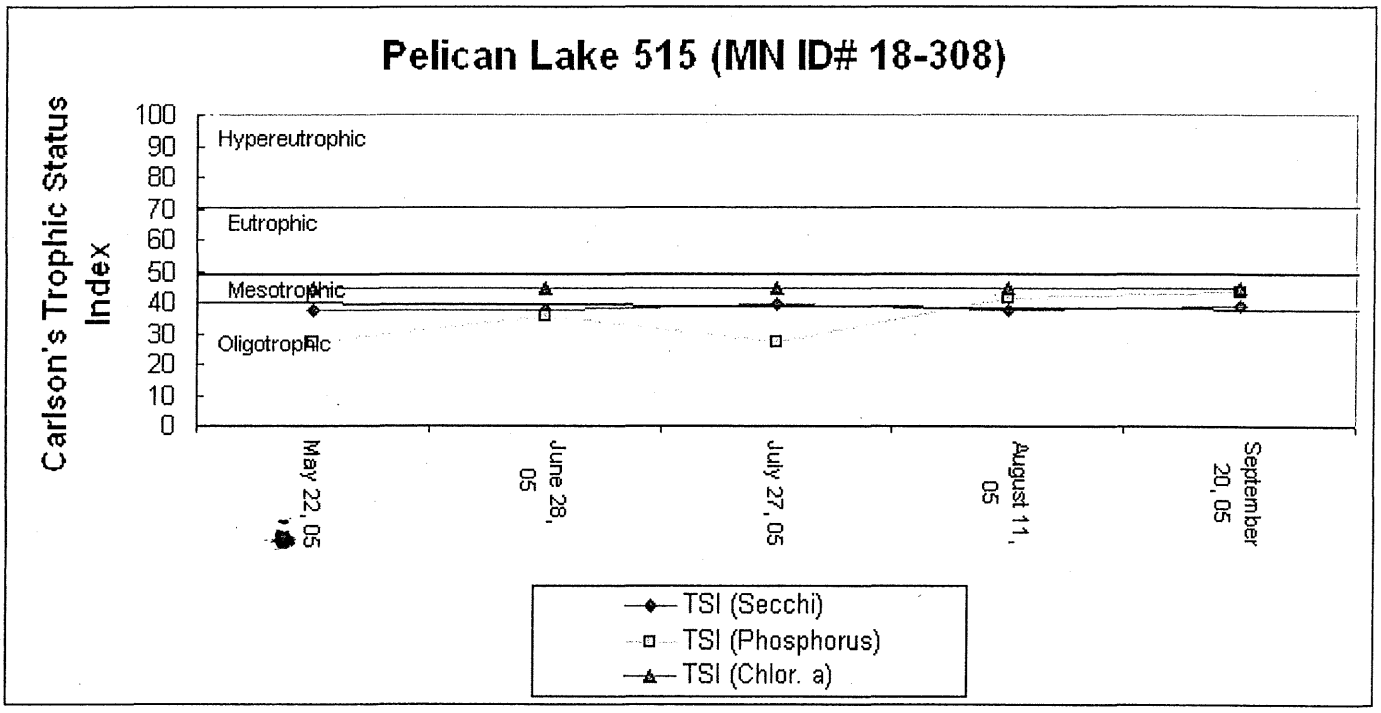
Optionally, boat owners can get out of their vehicle, inspect the boat, outdrive and trailer, then power wash particular areas, flush the outdrive, and wash live wells with an adjusted pressure spray.

Need to Contact Us?

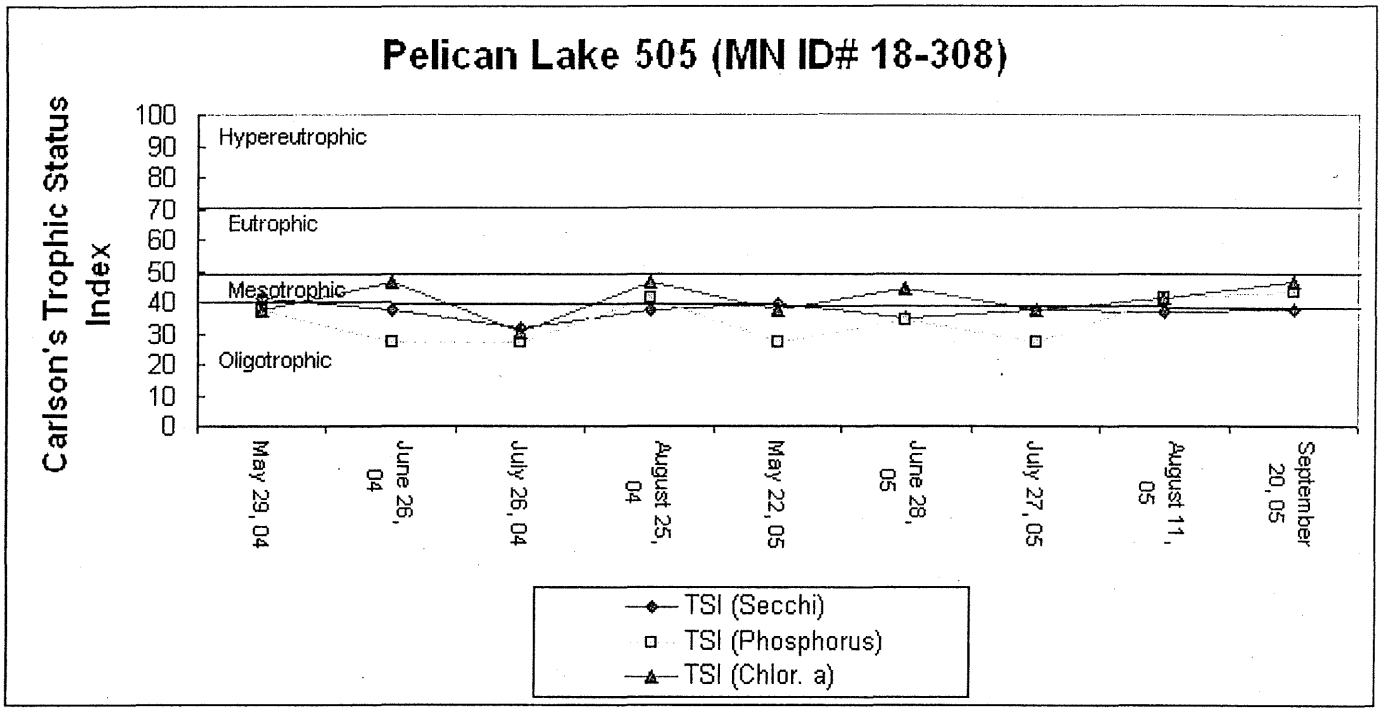
Glen Gustafson, President, glengustafson@msn.com
Joan Mondale, Communications, mondale@tds.net
Jim Strampe, Newsletter Ed., jstrampe@mn.rr.com

PLPOA
Box 823
Nisswa, MN 56468

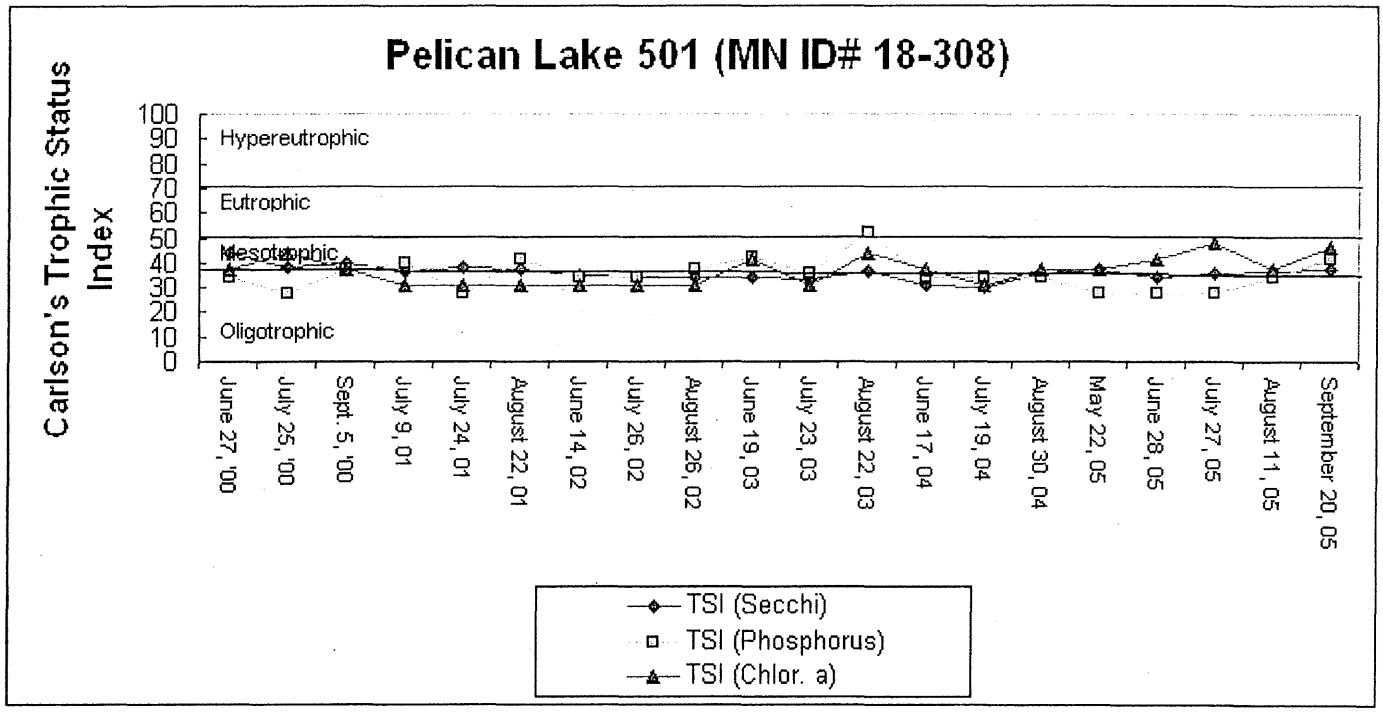
Curtis Mondale (7/31/05)
27646 County Rd 4
Pequot Lakes MN 56472



Date	Secchi (feet)	Total Phosphorus (ug/L)	Chlorophyll a (ug/L)	TSI (Secchi)	TSI (Phosphorus)	TSI (Chlor. a)	Avg. TSI
May 22, 05	15.6	5	4	37.5	27.4	44.2	36.4
June 28, 05	16	9	4	37.2	35.8	44.2	39.1
July 27, 05	14	<5	4	39.1	27.4	44.2	36.9
August 11, 05	16	13	4	37.2	41.1	44.2	40.8
September 20, 05	14.5	15	4	38.6	43.2	44.2	42



Date	Secchi (feet)	Total Phosphorus (ug/L)	Chlorophyll a (ug/L)	TSI (Secchi)	TSI (Phosphorus)	TSI (Chlor. a)	Avg. TSI
May 29, 04	12	10	2	41.3	37.4	37.4	38.7
June 26, 04	16	<5	5	37.2	27.4	46.4	37
July 26, 04	23.5	<5	1	31.6	27.4	30.6	29.9
August 25, 04	16	13	5	37.2	41.1	46.4	41.6
May 22, 05	14	5	2	39.1	27.4	37.4	34.6
June 28, 05	18.5	8	4	35.1	34.1	44.2	37.8
July 27, 05	15.6	<5	2	37.5	27.4	37.4	34.1
August 11, 05	16.5	13	3	36.7	41.1	41.4	39.7
September 20, 05	15.5	15	5	37.6	43.2	46.4	42.4



Date	Secchi (feet)	Total Phosphorus (ug/L)	Chlorophyll a (ug/L)	TSI (Secchi)	TSI (Phosphorus)	TSI (Chlor. a)	Avg. TSI
June 27, '00	10	8	2	43.9	34.1	37.4	38.5
July 25, '00	14.5	<5	4	38.6	27.4	44.2	36.7
Sept. 5, '00	13	10	2	40.2	37.4	37.4	38.3
July 9, 01	17	12	1	36.3	40	30.6	35.6
July 24, 01	15	5	1	38.1	27.4	30.6	32
August 22, 01	16	13	1	37.2	41.1	30.6	36.3
June 14, 02	19	8	1	34.7	34.1	30.6	33.1
July 26, 02	20	8	1	34	34.1	30.6	32.9
August 26, 02	20	10	1	34	37.4	30.6	34
June 19, 03	20	14	3	34	42.2	41.4	39.2
July 23, 03	21	9	1	33.2	35.8	30.6	33.2
August 22, 03	17	27	4	36.3	51.7	44.2	44.1
June 17, 04	24	8	2	31.3	34.1	37.4	34.3
July 19, 04	26	8	<1	30.2	34.1	30.6	31.6
August 30, 04	18	8	2	35.5	34.1	37.4	35.7
May 22, 05	16	<5	2	37.2	27.4	37.4	34
June 28, 05	20	11	3	34	27.4	41.4	34.3
July 27, 05	17.6	<5	6	35.8	27.4	48.2	37.1
August 11, 05	17	8	2	36.3	34.1	37.4	35.9
September 20, 05	15.5	13	5	37.6	41.1	46.4	41.7