BLUE WATER SCIENCE

550 South Snelling Avenue, St. Paul, MN 55116 651.690.9602

May 18, 2004

To: Steve Smithson, Van Vliet Lake
From: Blue Water Science

Re: **VAN VLIET LAKE MANAGEMENT PLAN**

Dear Mr. Steve Smithson,

This letter represents a contract for work on the Van Vliet Lake Management Report. The project period is through June 30, 2005, however, the plan can be finished before that date if possible.

The tasks of the project, costs, and payment schedule are outlined in Attachment A.

Total consulting costs for this project are $9,750.

AGREEMENT FOR SERVICES

Accepted to perform tasks associated with the Van Vliet Lake Management Plan as outlined in this Letter and in Attachment A by:

Signature _____
Name _____
Title _____
Date _____

Thank you for this opportunity. Please contact me any time for any questions.
A signed and returned copy of this letter is my authorization to proceed.

Cordially,
Blue Water Science

Steven R. McComas
President

Attachment A

Van Vliet Lake Work Plan - 2004

Roles and Responsibilities:

Tasks	Responsible Parties
Task 1 - Prepare a water quality management plan. Including characterizing current lake water quality conditions;	Van Vliet Lake Association (VVLA) - sample lake water quality, install lake level gage, and check county septic system records.
Watershed analysis and calculations of water and phosphorus budgets;	Blue Water Science (BWS)
Conduct a shoreland survey;	BWS and volunteer VVLA - conduct a shoreland inventory, pictures to be taken in June.
Conduct a wildlife inventory;	VVLA
Conduct a lake history overview.	VVLA
Task 2. Develop an aquatic plant surveys and response goal. Including conducting a macrophyte survey; study the potential for growth of dangerous exotic species and the potential response; and address problems of lake property owners denied immediate access to the lake by heavy aquatic growth.	BWS - check for curlyleaf in June, full survey in July and August. VVLA assist with plant survey. (collect sediment samples in July or August)
Task 3. Prepare fish management goals. Including review WDNR fisheries data and discuss impacts of tournament fisheries.	BWS
Task 4. Develop and conduct an information and education program.	BWS and VVLA

Blue Water Science Lake Visits:

April 26:kick off meeting, curlyleaf check, and water quality check
June 4-5: shoreland inventory, possible conductivity survey, install staff gage
July: start official plant survey, check beaver dams
August 6: finish plant survey, collect sediment samples

Timeline:

Tasks	April	May	June	July	August	Sept	Oct 04-June 05
1. Monitoring watershed stream quality.							
2. Conduct a shoreland survey.							
3. Website Development.							
4. Characterize current lake water quality conditions.							
5. Conduct a macrophyte program.							
6. Watershed analysis and calculation of pollutant budgets.							
7. Preparation of a comprehensive management plan for Van Vliet Lake.							
8. Produce an information and education program—incl. survey re-run							

9. Lake history.							

Details of Methods and Activities:

1. Prepare a Water Quality Management Plan.

Characterize current lake water quality conditions: A self-help water quality monitoring program is already in place for Van Vliet Lake. The lake is sampled in May, June, July, August, and September. Secchi disc transparencies are taken as well as samples for TP and Chlorophyll a analyses. The objective is to monitor and characterize water quality conditions over time to see if the lake water quality is getting better or worse and how Van Vliet measures up against regional and relevant lakes. The purpose is to determine how the water quality may be changing over time and to develop water quality goals objectives, and action plans in a living document.

The consultant (Steve McComas) will be on-site in June, July, and August and will work with the Lake Association volunteers to conduct additional lake sampling. We will collect water samples and scan them for dominant algal species.

***Watershed Analysis and Calculation of Water and Phosphorus Budgets*:** We will delineate watershed and sub-watershed boundaries and use land use maps and the results of the lake sampling program to calculate nutrient inputs to the lakes. Land use data for forests, wetlands, and residential areas will be determined and phosphorus loading estimates will be made. WILMS will be the lake model. We will run the LEAP model as soon as we delineate the watershed. Nutrient input data will be included in the plan to be compared with water budget data to determine if a lake phosphorus model can be developed. This will tell us if the lake is within ecoregion values. Appropriate goals will be developed to prepare simulation lake models to determine what nutrient reductions would be needed to meet ecoregion values if the lake is not within ecoregion values.

Goals and objectives will be developed, in consultation with the DNR, to address these and similar concerns.

Conduct a shoreland survey: The shoreland area of a lake is a critical factor in the maintenance of good water quality, support of fish and the aquatic environment, and contributes to the aesthetics of a northwoods lake. We will inventory the entire shoreline condition of Van Vliet Lake using photography and observations from the lake looking to shore. Inventory results will serve as a reference point for future comparisons as well as a way to identify natural areas. Evaluation of buffer strips will be conducted and corrective actions will be used to develop goals and objectives and recommendations in the Lake Plan. This inventory will be correlated with the data from the County/Township data.

Conduct a Wildlife Inventory: Lake Association volunteers will make wildlife observations over one calendar year: April 2004-April 2005. Mammals, reptiles, amphibians, and bird sightings will be recorded. A species list will be produced at the end of the year. The data will be reviewed and a determination made if such a survey and the resulting information would be valuable as an ongoing goal and activity in the Lake Plan. These wildlife inventory data will be observational and will be taken by lake resident volunteers.

***Conduct a Lake History Overview*:** A review of observations of past conditions in the Van Vliet Lake area will also be conducted by Lake Association volunteers. Pertinent results will be considered and utilized for the development of the Lake Management Plan, if appropriate.

A Lake History Overview will be begun documenting the geology and land use that have affected the lake, natural phenomena, economic influences, notable historical figures and more. Such information will be included in the Lake Management Plan for measurement of changes over time.

2. Develop an Aquatic Plant Survey and Response Goal.

Conduct a macrophyte survey: An aquatic plant survey will be conducted to examine the type of plants and coverage of plants found in Van Vliet Lake using Wisconsin DNR guidelines (Lowrance X-16 sonar tracings, and a minimum of 25 transects). Two sets of voucher specimens will be produced. Results from this survey will allow a calculation of percent of lake surface coverage, maximum depth colonized, and species distribution. A preliminary map of aquatic plant beds will be prepared. We will compare the findings with the limited surveys conducted in 1998 and 2003 and utilize the results in development of appropriate survey and response goals for the plan.

Study the Potential for Growth of Dangerous Exotic Species and the Potential Response: Knowing the potential for nuisance growth of exotic plants will help produce a contingency plan for the future. Curlyleaf pondweed and EWM is found in the county. If exotics appear in Van Vliet Lake, what will these exotic plants do? Knowing this will help establish a level of effort needed to manage an exotic plant invasion. Examples are:

1. Eurasian watermilfoil: are there areas in the lake that may support nuisance growth of the exotic plant, Eurasian watermilfoil

2. Curlyleaf pondweed: are the sediment conditions suitable to support nuisance growth of the exotic plant, curlyleaf pondweed.

Two Association members have completed Milfoil Masters Training. So there are current lake residents on the lookout for exotics. Training of other lake residents may be of value in continuing surveillance of the invasion of exotics in the lake. An important question to address is what will happen if exotics get into Van Vliet?

Other regional and relevant lake plans and projects will be reviewed to learn what preventative measures and security can be implemented for the DNR Public boat landing to guard against the introduction of exotics.

Address Problems of Lake Property Owners Denied Immediate Access to the Lake by Heavy Aquatic Growths: We know that there is a perception of excessive aquatic plants in some portions of the lake which make it unpleasant for some of the users in those areas. However, without an integrated look at the lake, we can't say what, how, and when, if anything, should be done. An aquatic plant management goal(s) could suggest if targeted removal should be done and when monitoring is the best solution.

Following the Aquatic Plant Surveys and mapping, owners will be advised of alternatives available based on guidance of DNR, educational and determination of effectiveness. These

would include raking, education, or other techniques suggested by DNR and permitted where required.

Appropriate short and long term goals and objectives will be developed for the Lake Plan based on the surveys and results obtained.

3. Prepare Fish Management Goals

Review WDNR fisheries data and discuss impacts of tournament fishing: We will review WDNR fish survey data, stocking data and interview WDNR-Fishery professionals on the status of the fish community in Van Vliet Lake. We will incorporate the effects of fishing techniques and size and quota regulations, aquatic plants and water quality in goals related to long-term, sustainable fish populations. We will work with the WDNR to formulate fish management goals.

4. Develop and conduct an information and education program:

An important component of this plan is to develop an information and education program. We feel this is critical for long-term protection of Van Vliet Lake.

A lake and watershed newsletter summarizing problems, planning efforts and progress, and project findings will be prepared. The newsletter will contain lake and watershed information and project results and projects, and will complement the existing newsletter programs by providing additional educational materials to share with lake residents and other interested parties.

With this Wisconsin Lake Management Grant Program we should be able to characterize the lake and watershed and involve and inform the lake residents on how their lake works and how to protect and improve it.

A VVLA website will be developed to facilitate communication, enhance education and information exchange regarding the VVLA efforts and progress. The Consultant will provide value added guidance from experience with other client associations.

Budget for Blue Water Science

Consulting services: $9,750

Payment Schedule: 1/3 or $3,300 at initiation of program; 1/3 or $3,300 at the mid-point (December) and the final 1/3 or $3,400 after acceptance of the final report.