

WISCONSIN DEPARTMENT OF NATURAL RESOURCES
LAKE MANAGEMENT PLANNING GRANT PROGRAM

Application Materials

*Big Arbor Vitae Lake
Beaver Dam Phosphorus Monitoring*

Prepared for

Big Arbor Vitae Lake Association

February 1, 2014

Onterra LLC
Lake Management Planning

INTRODUCTION

Big Arbor Vitae Lake, Vilas County, is a 1090-acre drainage lake with a maximum depth of 41 feet. It is located just northeast of the Town of Woodruff and is within the Wisconsin River drainage basin. There is one non-native plant found in Big Arbor Vitae Lake (curly-leaf pondweed, documented in 2008) in addition to several other AIS including banded mystery snail, Chinese mystery snail and rusty crayfish. Another non-native plant, Eurasian water milfoil, is located in several nearby lakes including Arrowhead Lake (1.5 miles away) and Minocqua Lake (2.7 miles away) as well as the Rainbow Flowage (6.2 miles away). Because of the occurrence of curly-leaf pondweed within Big Arbor Vitae Lake and the proximity to several lakes with Eurasian water milfoil, the Big Arbor Vitae Lake Association (BAVLA) contracted with Onterra, LLC to oversee a large-scale lake management planning project in 2011. The goal of this planning project was to collect baseline information about the BAVLA's treasured lake and develop a comprehensive strategy to manage and protect it.



Photo 1. Excessive growth of coontail and northern water milfoil in Big Arbor Vitae Lake. Photo taken during August 2012 survey.



Photo 2. Blue-green algae bloom on Big Arbor Vitae Lake. Photo taken during August 2012 survey.

In addition to concerns over the curly-leaf pondweed found in the lake, BAVLA members expressed during the planning project concern over what they believed to be nuisance levels of native aquatic plants occurring in the lake.

During an August 2012 visit to the lake, Onterra ecologists mapped the locations of “nuisance” levels of submergent aquatic plants on the lake. The word nuisance is somewhat subjective; conditions fitting this description were observed in some areas of the lake though, with the plants growing to the point in which they began canoping the surface water (Photo 1). Under these conditions, navigation would be impaired for riparian property owners accessing the lake.

Anecdotal accounts of worsening algae blooms were also discussed with Onterra ecologists during the project. Indeed, during the August 2012 nuisance plant survey, a very large algae bloom was observed on Big Arbor Vitae Lake as well (Photo 2). Onterra ecologists documented the bloom with photographs and sent them to WDNR staff, who confirmed the bloom as being

that of blue-green algae. Swimming restrictions were placed on the lake as a precautionary measure until the blooms had subsided.

During the Big Arbor Vitae Management Planning Project, the water quality of the lake and the condition of the lake's watershed were assessed. The watershed surrounding Big Arbor Vitae Lake was found to be largely in a natural condition, consisting of 63% forest and 19% wetland with very minimal portions of pasture/grass, row crops or rural residential land cover types. Further, the shoreland zone was determined to be nearly 70% natural or undeveloped, while some areas of high development (17%) were noted. An analysis of the water quality conditions in the lake determined that the surface water quality is fair most often, though higher periods do exist which spur algae blooms such as those seen in Photo 2. Modeling of the lake's water quality and watershed determined that an unaccounted source of phosphorus exists. This unaccounted for, or unknown, source is estimated to produce 55% of the lake's annual phosphorus load, or 1,091 lbs.

On September 19, 2012, a single sediment core was collected from the deep hole in Big Arbor Vitae Lake with a gravity corer by Tim Hoyman, Onterra and Paul Garrison, WDNR. Mr. Garrison analyzed the upper portion and lower portions for diatom assemblages. These are special algae types that are very representative of nutrient conditions within a lake. When examined in the upper layer, certain diatom types are known to represent current conditions. In the deeper layer of the sediment core, these diatoms represent conditions over 100 years earlier in the lake. A determination of nutrient concentrations can be derived from looking at what diatoms are present during those timeframes. In the case of the Big Arbor Vitae core sample, the differences in the diatom assemblages between the two layers indicate that historical phosphorus levels were significantly lower over 100 hundred years ago. This is important information because it confirms that the current high levels of phosphorus found in Big Arbor Vitae Lake are not natural and are likely the result of cumulating anthropogenic impacts. A core sample taken from Little Arbor Vitae Lake, downstream of Big Arbor Vitae Lake, produced similar results.

It is currently believed by Onterra ecologists that internal nutrient loading contributes a large portion of this unaccounted for phosphorus source. A potential second source includes the two tributary streams that enter Big Arbor Vitae Lake. Onterra staff visited the streams in fall 2012 to determine the feasibility of monitoring them for flow and nutrient content. The two streams are each impounded slightly by beaver dams; on the northwestern stream the dam is located upstream from the lake slightly while the northeastern stream's dam is located at the point in which the stream meets the lake.

Beaver dams have been shown to alter water quality within a stream in a number of ways. Some beaver dams will remove phosphorus from the water column before moving downstream while some beaver dams will cause the phosphorus levels in the water to increase. In essence, beaver ponds create a unique habitat that changes the biology, chemistry and physical components of what was previously a stream environment. Surface water flow patterns, water temperature and oxygen content, groundwater movement, macroinvertebrate and bacterial assemblages and a host of other ecological factors may change from the inclusion of a beaver dam. Fuller and Peckarsky (2011) demonstrated that beaver dam factors such as flow rate, pond size and dam height all play a factor into how nutrients react within a ponded dam. Klotz (1998) found that in five beaver ponds across New York State, the biochemical processes in three dams increase soluble reactive

phosphorus downstream during the summer and in one pond during the winter. The remaining two ponds were consistent in reducing soluble reactive phosphorus at all times of the year.

The BAVLA is naturally concerned with the algae blooms and elevated phosphorus levels in Big Arbor Vitae Lake. Studies aimed at quantifying and compartmentalizing the nutrient load to the lake have been discussed, however, the presence of the beaver dams present an interesting and logistical dilemma to managers aiming to monitor the streams and study Big Arbor Vitae Lake. The beaver dam on the northeast inlet makes it impossible to determine inlet flow because the dam defuses the incoming water to multiple locations as it seeps through it. Conversations between Onterra and State Forest officials confirmed they would allow the removal of the dam if it was demonstrated that the dam is harming the lake by increasing the amount of phosphorus that enters the lake. This proposed study is designed to help understand if the beaver dam is causing more phosphorus to enter the lake than normal. If it is determined that the beaver dam is removing phosphorus from the inlet waters before it enters the lake, then the best option for management would be to leave the beaver dam in place. The same condition exists for the dam located on the northwestern tributary. Should it be demonstrated that either of these dams are increasing phosphorus levels, actions to move forward with mitigation would be pursued.

Big Arbor Vitae Lake is within Township 40N, Range 7E, and area classified as being of Special Natural Resource Interest. This area contains numerous known occurrences of rare species that are threatened or of special concern, including Robbins' spikerush (*Eleocharis robbinsii*), American shore-grass (*Littorella Americana*) and northeastern bladderwort (*Utricularia resupinata*). A 2011 point-intercept survey found 33 species of aquatic plants within the lake, with an overall FQI value of 29.9; higher than the Northern Lakes and Forest Lakes' ecoregion median as well as the State of Wisconsin median value. Big Arbor Vitae Lake itself is classified by the WDNR as Class A2 Musky waters, meaning exceptional fishing opportunity for this species can be found here.

Big Arbor Vitae Lake supports three boat landings with a combined total of 65 car-trailer parking spaces. As defined by NR 1.91, the lake exceeds the minimum public boating access by having one or more access sites with a total of more than 29 car-trailer parking spaces. These boat landings are both paved and include boarding docks. In addition, a picnic area is available at the landing on the north side of the lake. Between these boat launches, the campground, and the seven resorts that are situated on Big Arbor Vitae Lake, there are many ways for the public to enjoy this natural resource.

PROJECT SCOPE

The scope of work described outlines a project and study design that will allow Onterra staff to properly assess the nutrient content of each tributary on numerous occasions during 2014. A general assessment of nutrient conditions will be conducted following, as described below.

Water quality conditions would be monitored within each Big Arbor Vitae Lake tributary in order to assess total phosphorus and soluble reactive phosphorus conditions. Each visit, three samples would be collected from each stream (Map 1). On the northwestern stream, a single sample would be collected downstream of the dam, while two samples would be taken upstream of the dam in various degrees (one further than the other). The northeastern tributary would be

sampled differently, as the beaver dam’s location (right along the shoreline of the lake) makes separating stream nutrient content from lake nutrient content difficult. All three samples would be collected upstream of the dam, with the first collected within the pooled dam, the last taken far upstream and the second taken in-between. This would allow for an analysis of how phosphorus concentrations are changing as they move downstream. All samples requiring laboratory analysis would be processed through the Wisconsin State Laboratory of Hygiene. During each sampling event surface temperature, pH and dissolved oxygen would be collected.

PROJECT DELIVERABLES

Comparative statistics would be used to draw conclusions on the impact of each beaver dam on the tributary phosphorus concentrations. The final product for this project would be a single report that would document the water quality observations and measurements obtained during the project study. Additionally, a narrative on recommended actions for the BAVLA to move further in studying Big Arbor Vitae Lake and its tributaries would be provided. An electronic copy of the report would be provided to the BAVLA and WDNR, with a paper copy made available upon request.

TENTATIVE PROJECT SCHEDULE

Table 1 provides an approximate timeline for completion of the tasks. The schedule needs to be flexible to accommodate for weather, scheduling conflicts, etc., but it provides a general indication of the dates for completing the proposed components.

Table 1. Approximate Project Schedule for 2014 – 2015.

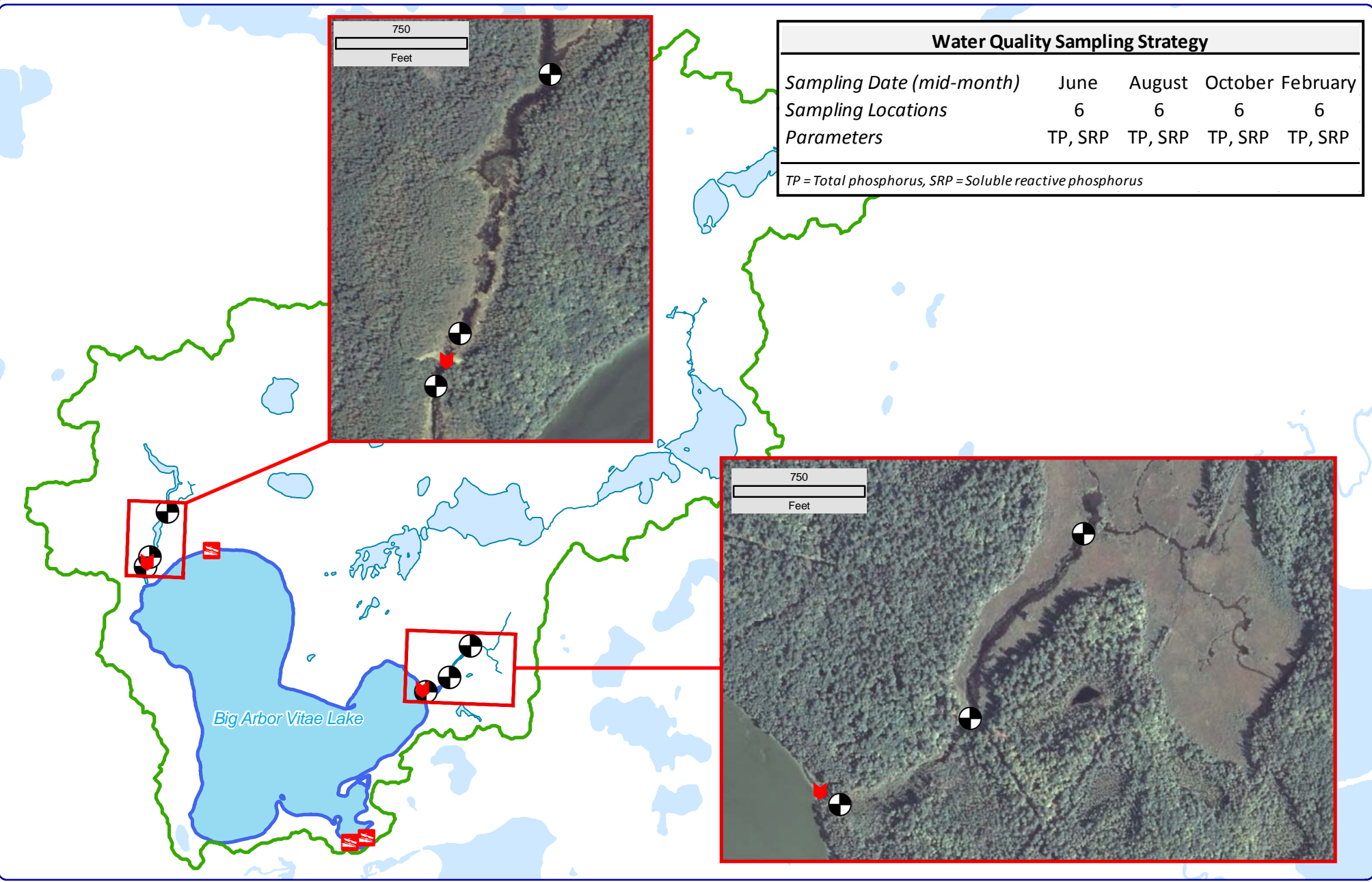
Task	2014												2015											
	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S				
Water Quality Sample																								
Data Analysis																								
Report Completion																								

LITERATURE CITED

- Fuller, M.R. and B.L. Peckarsky. 2011. Does the morphology of beaver ponds alter downstream ecosystems? *Hydrobiologia*. Vol. 668, pp 35-48.
- Klotz, R.L. 1998. Influence of beaver ponds on the phosphorus concentration of stream water. *Canadian Journal of Fisheries and Aquatic Sciences*. Vol. 55, pp. 1228-1235.

PROJECT COST BREAKDOWN

	Cash Cost	Donated Value
Onterra Fees		
Project Administration & Communications	\$190.00	
Phosphorus Sample Collections	\$2,930.00	
Data Analysis & Report Writing	\$285.00	
Travel Expenses	\$700.00	
Sample Shipping	\$50.00	
<i>Subtotal</i>	\$4,155.00	
Other Fees		
State Laboratory of Hygiene Fees	\$990.00	
Volunteer & In-kind Match Opportunities		
BAVLA Grant Project Administration		\$180.00
<i>Subtotal</i>	\$5,145.00	\$180.00
Project Total	\$5,325.00	
WDNR Portion (67% or \$3,000)	\$3,000.00	



Water Quality Sampling Strategy				
Sampling Date (mid-month)	June	August	October	February
Sampling Locations	6	6	6	6
Parameters	TP, SRP	TP, SRP	TP, SRP	TP, SRP
TP = Total phosphorus, SRP = Soluble reactive phosphorus				

Onterra LLC
 Lake Management Planning
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 De Pere, WI 54115
 920.338.8860
 www.onterra-eco.com

Sources:
 Hydro: WDNR
 Orthophotography: NAIP, 2010
 Watershed: WDNR & Onterra
 Beaver Dam Locations mapped by Onterra
 Map date: May 10, 2013
 Filename: BAV_BeaverDam_Monitoring.mxd

Project Location in Wisconsin

- Legend**
- Big Arbor Vitae Lake
 - WDNR Hydro Arc Shapefile
 - Watershed Boundary
 - Public Boat Landing
 - Water Quality Monitoring Point
 - Beaver Dam

Big Arbor Vitae Lake
 Vilas County, Wisconsin
**Beaver Dam Study
 Monitoring Locations**

Notice: Use of this form is required by the DNR for any application filed pursuant to ch. NR 190 or 191, Wis. Adm. Code. Personal information (PI data) collected on this form, including such data as your name, address, phone number, etc., will be used for management and enforcement of DNR programs, and is not intended to be used for any other purpose. Information will be made accessible to requesters under Wisconsin's Open Records laws (s. 19.32 – 19.39, Wis. Stats.) and requirements.

Section I: Application Type

<input checked="" type="checkbox"/> Lake Management Planning Grant <i>Check one:</i> <input type="checkbox"/> Large-scale planning grant <input checked="" type="checkbox"/> Small-scale planning grant <i>Check one:</i> <input type="checkbox"/> Self-help lake trend monitoring package <input type="checkbox"/> Lake education <input type="checkbox"/> Organizational development <input type="checkbox"/> Other study or assessment, or multiple-purpose project	<input type="checkbox"/> Lake Management Protection Grant <i>Check one:</i> <input type="checkbox"/> Wetland restoration <input type="checkbox"/> Ordinance development <input type="checkbox"/> Lake Improvement <input type="checkbox"/> Lake classification <input type="checkbox"/> Land or easement acquisition
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Legislative District Numbers		To determine your legislative district, go to http://165.189.139.210/WAML/ Type in complete address, next screen shows information
Senate	Assembly	
12	34	

Section II: Applicant Information

Applicant Big Arbor Vitae Lake Association			Type of Eligible Applicant		
Lake Name Big Arbor Vitae Lake		Size in Acres 1090	<input type="checkbox"/> County	<input type="checkbox"/> Tribe	<input type="checkbox"/> Other Governmental Unit
Project County/Township/Section/Range Vilas/T40N/R07E/S30			<input type="checkbox"/> City	<input type="checkbox"/> Sanitary District	<input type="checkbox"/> Non Profit Conservation Organization
Authorized Representative Named by Resolution Mary Lou Shepski			<input type="checkbox"/> Village	<input type="checkbox"/> Lake District	<input type="checkbox"/> School Districts (Planning)
Authorized Representative Title Secretary			<input type="checkbox"/> Town	<input checked="" type="checkbox"/> Lake Association	
Address 1874 Buckhorn Rd			Project Contact Name Tim Hoyman		
City Arbor Vitae			Project Contact Title Aquatic Ecologist, Onterra, LLC		
State WI			Address 815 Prosper Road		
ZIP Code 54568			City De Pere		State WI
Daytime Phone (area code) 715.356.6917			Evening Phone (area code)		ZIP Code 54115
E-mail Address marken711@frontier.com			Daytime Phone (area code) 920.338.8860		
			Evening Phone (area code) 920.362.5698 (Cell)		
E-mail Address marken711@frontier.com			E-mail Address thoyman@onterra-eco.com		

Mail Check to: (if different from applicant)

Name and Title		Address	
Organization		City	State
		ZIP Code	

For DNR Use Only			
Application Type	Date Received	Date Reviewed (LC)	Lake Coordinator Approval / Date
Waterbody ID#	Adequate Public Access <input type="checkbox"/> Yes <input type="checkbox"/> No		Environmental Grants Specialist Approval / Date
Eligible Project <input type="checkbox"/> Yes <input type="checkbox"/> No	Eligible Applicant <input type="checkbox"/> Yes <input type="checkbox"/> No		Project Priority Rank
Prior Grant Award(s) <input type="checkbox"/> Yes <input type="checkbox"/> No	Fiscal Year(s)	Amount Received To Date \$	Project Awarded <input type="checkbox"/> Yes <input type="checkbox"/> No

Lake Management Grant Application

Form 8700-283 (R 11/07)

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Section III: Project Information

Project Title Big Arbor Vitae Lake Beaver Dam Phosphorus Monitoring		Proposed Ending Date June 30, 2015	
Other Management Units Around Lake	Letter of Support	Other Management Units Around Lake	Letter of Support
1. Town of Arbor Vitae	<input checked="" type="checkbox"/>	4.	<input type="checkbox"/>
2. Vilas County Land and Water Cons. Dept.	<input checked="" type="checkbox"/>	5.	<input type="checkbox"/>
3.	<input type="checkbox"/>	6.	<input type="checkbox"/>

Section IV: Lake Access

Number of Public Vehicle Trailer Parking Spaces Available at Public Access Sites:	65
Number of Public Access Sites on Lake Including Boat Launches and Walk-ins:	3

Section V: Cost Estimate and Grant Request

Section V must be completed or application will be returned. Details in support of Section V are welcome.	Project Costs		
	Column 1 Cash Costs	Column 2 Donated Value	DNR Use Only
1. Salaries, wages and employee benefits			
2. Consulting services	\$4,155.00		
3. Purchased services			
4. Other purchased services (specify):			
5. Plant material			
6. Supplies (specify)			
7. Depreciation on equipment			
8. Hourly equipment use charges			
9. State Lab of Hygiene (SLOH) Costs	\$990.00		
10. Non-SLOH Lab Costs			
11. Land or easement acquisition value			
12. Associated acquisition costs			
13. Other (specify) Volunteer Efforts		\$180.00	
14. Subtotals (sum each column)	\$5,145.00	\$180.00	
15. Total Project Cost Estimate (sum of column 1 plus sum of column 2)	\$5,325.00		
16. State Share Requested (up to 75% of total costs may be requested)	\$3,000.00		

Up to 75% of total costs may be requested, subject to the following maximum grant amounts:

- Large-scale lake planning projects—up to \$10,000
- Small-scale lake planning projects—up to \$3,000
- Lake classification and regulation or ordinance development projects—up to \$50,000
- Lake protection projects (other than lake classification and regulation or ordinance development projects)—up to \$200,000

Section VI: Attachments (check all that are included)

A. For all applicants:

- 1. Authorizing resolution
- 2. Letters of support
- 3. Map of project location and boundaries
- 4. Itemized breakdown of expenses
- 5. For projects that entail sending samples to the State Laboratory of Hygiene (SLOH) only: a completed SLOH Projected Cost Form
- 6. Project scope/description:
 - a. Description of project area
 - b. Description of problem to be addressed by project
 - c. Discussion of project goals and objectives
 - d. Description of methods and activities
 - e. Description of project products or deliverables
 - f. Description of data to be collected, if applicable
 - g. Description of existing and proposed partnerships
 - h. Discussion of role of project in planning and/or management of lake
 - i. Timetable for implementation of key activities
 - j. Plan for sharing project results
 - k. Other information in support of project not described above

B. For applicants that are Lake Management Organizations (LMOs) or Non-profit Conservation Organizations (NCOs):

- 1. For first time applicant LMOs only: A completed Form 8700-226 (Lake Association Organizational Application)
- 2. For first time applicant NCOs only: Copy of IRS 501(c)(3) determination letter and copies of your Articles of Incorporation and Bylaws
- 3. List of national and/or statewide organizations with which you are affiliated
- 4. List of board members' names, including municipality and county of residence. Designate officers
- 5. Documentation of current financial status
- 6. For land or easement acquisition projects: Detailed description of your organization's land management experience
- 7. Brochures, newsletters, annual reports or other information about your organization

C. Wetland Restoration Projects:

- 1. Deed, easement, or land control agreement
- 2. Preliminary engineering plans
- 3. Water regulatory permits

D. Ordinance Development Projects:

- 1. Inventory of applicable existing ordinances
- 2. Description of resources each jurisdiction allocates to enforcement
- 3. Preliminary surveys

E. Lake Improvement Projects:

- 1. Engineering and design plans
- 2. Water regulatory permits
- 3. Map of project location and boundaries

Section VI: Attachments, continued

F. Land or easement acquisition projects:

- 1. DNR Form 1800-1 (Environmental Hazards Assessment Form)
- 2. Legal description of the property
- 3. Project location boundary map
- 4. Property or easement appraisal (if not previously submitted to the Department)
- 5. If escrow closing, the title insurance commitment
- 6. Evidence of compliance with Uniform Relocation Act requirements, if applicable
- 7. Agricultural Impact Statement, if applicable
- 8. Status of acquisition negotiations, including expected time frame for closing
- 9. A land management plan
 - a. Full description of property and conditions
 - b. Description of current and proposed uses of property and adjoining properties
 - c. Management requirements for property
 - d. If roads, piers or grading are proposed, a topographic survey with feature locations, and design cross sections

Section VII: Certification

I certify that information in this application and all its attachments are true and correct and in conformity with applicable Wis. Statutes.

Print/Type Name of Authorized Representative Mary Lou Shepski	Title of Authorized Representative Secretary
Signature of Authorized Representative	Date Signed

LAKE/RIVER PLANNING GRANTS PROJECTED LAB COSTS

First Year FY 2014

Lake Name: Big Arbor Vitae Lake
 Waterbody ID#: 1545600
 County: Vilas
 Applicant Name: Big Arbor Vitae Lake Association
 Will the Lab be doing filtration for dissolved parameters? (Y/N) Y
 Will field tests be recorded on the Lab Slip? N

Review Period:
 Application Period:

2013

2014

Test ID	Parameter	Samples/Month												Analyses/ Fiscal Year	Price/ Analysis	Annual Cost For Parameter	
		July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun				
NUTRIENTS																	
I530CLD	DISSOLVED REACTIVE P (ORTHO)													6	6	\$16.67	\$100.02
I520PLT	TOTAL PHOSPHORUS													6	6	\$23.60	\$141.60
I520PLD	TOTAL DISS PHOSPHORUS (AS P), (EPA 365.1)														0	\$23.60	\$0.00
I470DLT	TOTAL KJELDAHL NITROGEN														0	\$32.99	\$0.00
I460MLD	NITRATE+NITRITE (AS N), DISS (EPA 353.2)														0	\$27.00	\$0.00
I440NLD	AMMONIA-N, DISSOLVED														0	\$25.89	\$0.00
OTHER WET CHEMISTRY																	
I305ALT	AUTOMATED CONDUCTIVITY, PH & ALKALINITY														0	\$22.00	\$0.00
I120ALT	ALKALINITY, GRAN TECHNIQUE														0	\$54.00	\$0.00
I240FLT	CHLORIDE														0	\$20.00	\$0.00
I251UNF	CHLOROPHYLL A, FLUORESCENCE, FIELD FILTERED														0	\$23.28	\$0.00
I251UNL	CHLOROPHYLL A, FLUORESCENCE LAB FILTERED														0	\$24.52	\$0.00
I290ALT	COLOR, TRUE, PT-CO														0	\$25.00	\$0.00
I340IR1	HARDNESS, CALCULATION METHOD (When Metals Done)														0	\$5.37	\$0.00
	HARDNESS, CALCULATION METHOD (When Metals not Done)														0	\$52.82	\$0.00
I600ELT	SULFATE (EPA 375.2)														0	\$26.00	\$0.00
I650JLT	SUSPENDED SOLIDS														0	\$18.80	\$0.00
I640ILD	TOTAL DISSOLVED SOLIDS, 180 C														0	\$17.13	\$0.00
I650JLV	TOTAL VOLATILE SOLIDS														0	\$10.03	\$0.00
I660NLT	TURBIDITY														0	\$10.00	\$0.00
I720BLT	FIELD TESTS (For each labslip with Field Testing Recorded)														0	\$3.00	\$0.00
TOTAL METALS																	
I230IR1	CALCIUM, TOTAL RECOVERABLE, ICP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$13.00	\$0.00
I370IR1	IRON, TOTAL RECOVERABLE, ICP														0	\$13.00	\$0.00
I390IR1	MAGNESIUM, TOTAL RECOVERABLE, ICP														0	\$13.00	\$0.00
I400IR1	MANGANESE, TOTAL RECOVERABLE, ICP														0	\$13.00	\$0.00
I540IR1	POTASSIUM, TOTAL RECOVERABLE, ICP														0	\$13.00	\$0.00
I580IR1	SODIUM, TOTAL RECOVERABLE, ICP														0	\$13.00	\$0.00
I322IR1	DIGESTION, TOT. RECOV. LOW LEVEL, ICP + ICP SETUP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$21.45	\$0.00
WATER BACTI																	
B152ALT	E COLI ENZYMATIC SUBTRATE QUANTITRAY MPN														0	\$37.00	\$0.00
B200ALT	Fecal Coliform (MFFCC)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	\$37.00	\$0.00

Grand Total = \$241.62

Number of Inorganic Lab Slips (Machine Determined)
 Number of Bacti Lab Slips (Machine Determined)
 Number of Inorganic Lab Slips (from workplans)

0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	=Total Inorganic Lab Slips for Fiscal Year
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	=Total Bacti Lab Slips for Fiscal Year

LAKE/RIVER PLANNING GRANTS PROJECTED LAB COSTS

Second Year FY 2015

Lake Name: Big Arbor Vitae Lake
 Waterbody ID#: 1545600
 County: Vilas
 Applicant Name: Big Arbor Vitae Lake Association
 Will the Lab be doing filtration for dissolved parameters? (Y/N)
 Will field tests be recorded on the Lab Slip?

Review Period:
 Application Period:

N 2014
 N 2015

Parameter	Samples/Month												Analyses/ Fiscal Year	Price/ Analysis	Annual Cost For Parameter
	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun			
NUTRIENTS															
DISSOLVED REACTIVE P (ORTHO)		6		6				6					18	\$17.17	\$309.06
TOTAL PHOSPHORUS		6		6				6					18	\$24.31	\$437.54
TOTAL DISS PHOSPHORUS (AS P), (EPA 365.1)													0	\$24.31	\$0.00
TOTAL KJELDAHL NITROGEN													0	\$33.98	\$0.00
NITRATE+NITRITE (AS N), DISS (EPA 353.2)													0	\$27.81	\$0.00
AMMONIA-N, DISSOLVED													0	\$26.67	\$0.00
OTHER WET CHEMISTRY															
AUTOMATED CONDUCTIVITY, PH & ALKALINITY													0	\$22.66	\$0.00
ALKALINITY, GRAN TECHNIQUE													0	\$55.62	\$0.00
CHLORIDE													0	\$20.60	\$0.00
CHLOROPHYLL A, FLUORESCENCE, FIELD FILTERED													0	\$23.98	\$0.00
CHLOROPHYLL A, FLUORESCENCE LAB FILTERED													0	\$25.26	\$0.00
COLOR, TRUE, PT-CO													0	\$25.75	\$0.00
HARDNESS, CALCULATION METHOD (When Metals Done)													0	\$5.53	\$0.00
HARDNESS, CALCULATION METHOD (When Metals not Done)													0	\$54.40	\$0.00
SULFATE (EPA 375.2)													0	\$26.78	\$0.00
SUSPENDED SOLIDS													0	\$19.36	\$0.00
TOTAL DISSOLVED SOLIDS, 180 C													0	\$17.64	\$0.00
TOTAL VOLATILE SOLIDS													0	\$10.33	\$0.00
TURBIDITY													0	\$10.30	\$0.00
FIELD TESTS (For each labslip with Field Testing Recorded)													0	\$3.09	\$0.00
TOTAL METALS															
CALCIUM, TOTAL RECOVERABLE, ICP	0	0	0	0	0	0	0	0	0	0	0	0	0	\$13.39	\$0.00
IRON, TOTAL RECOVERABLE, ICP													0	\$13.39	\$0.00
MAGNESIUM, TOTAL RECOVERABLE, ICP													0	\$13.39	\$0.00
MANGANESE, TOTAL RECOVERABLE, ICP													0	\$13.39	\$0.00
POTASSIUM, TOTAL RECOVERABLE, ICP													0	\$13.39	\$0.00
SODIUM, TOTAL RECOVERABLE, ICP													0	\$13.39	\$0.00
DIGESTION, TOT. RECOV. LOW LEVEL, ICP + ICP SETUP	0	0	0	0	0	0	0	0	0	0	0	0	0	\$22.09	\$0.00
WATER BACTI															
E COLI ENZYMATIC SUBTRATE QUANTITRAY MPN													0	\$38.11	\$0.00
Fecal Coliform (MFFCC)	0	0	0	0	0	0	0	0	0	0	0	0	0	\$38.11	\$0.00
														Grand Total =	\$746.61

Number of Inorganic Lab Slips (Machine Determined) 0 6 0 6 0 0 0 6 0 0 0 0 18 =Total Inorganic Lab Slips for Fiscal Year
 Number of Bacti Lab Slips (Machine Determined) 0 0 0 0 0 0 0 0 0 0 0 0 0 =Total Bacti Lab Slips for Fiscal Year
 Number of Inorganic Lab Slips (from workplans)

LAKE/RIVER PLANNING GRANTS PROJECTED LAB COSTS

Grand Total

Lake Name: Big Arbor Vitae Lake
 Waterbody ID#: 1545600
 County: Vilas
 Applicant Name: Big Arbor Vitae Lake Association

Review Period:
 Application Period:

Parameter	Analyses For Grant	Grant Cost For Parameter
NUTRIENTS		
DISSOLVED REACTIVE P (ORTHO)	24	\$409.08
TOTAL PHOSPHORUS	24	\$579.14
TOTAL DISS PHOSPHORUS (AS P), (EPA 365.1)	0	\$0.00
TOTAL KJELDAHL NITROGEN	0	\$0.00
NITRATE+NITRITE (AS N), DISS (EPA 353.2)	0	\$0.00
AMMONIA-N, DISSOLVED	0	\$0.00
OTHER WET CHEMISTRY		
AUTOMATED CONDUCTIVITY, PH & ALKALINITY	0	\$0.00
ALKALINITY, GRAN TECHNIQUE	0	\$0.00
CHLORIDE	0	\$0.00
CHLOROPHYLL A, FLUORESCENCE, FIELD FILTERED	0	\$0.00
CHLOROPHYLL A, FLUORESCENCE LAB FILTERED	0	\$0.00
COLOR, TRUE, PT-CO	0	\$0.00
HARDNESS, CALCULATION METHOD (When Metals Done)	0	\$0.00
HARDNESS, CALCULATION METHOD (When Metals not Done)	0	\$0.00
SULFATE (EPA 375.2)	0	\$0.00
SUSPENDED SOLIDS	0	\$0.00
TOTAL DISSOLVED SOLIDS, 180 C	0	\$0.00
TOTAL VOLATILE SOLIDS	0	\$0.00
TURBIDITY	0	\$0.00
FIELD TESTS (For each lab slip with Field Testing Recorded)	0	\$0.00
TOTAL METALS		
CALCIUM, TOTAL RECOVERABLE, ICP	0	\$0.00
IRON, TOTAL RECOVERABLE, ICP	0	\$0.00
MAGNESIUM, TOTAL RECOVERABLE, ICP	0	\$0.00
MANGANESE, TOTAL RECOVERABLE, ICP	0	\$0.00
POTASSIUM, TOTAL RECOVERABLE, ICP	0	\$0.00
SODIUM, TOTAL RECOVERABLE, ICP	0	\$0.00
DIGESTION, TOT. RECOV. LOW LEVEL, ICP + ICP SETUP	0	\$0.00
WATER BACTI		
E COLI ENZYMATIC SUBTRATE QUANTITRAY MPN	0	\$0.00
Fecal Coliform (MFFCC)	0	\$0.00
Grand Total =		\$988.23

Lake Planning Grant Priorities Small-Scale Ranking Questions	Ranking Points	Big Arbor Vitae Lake	Notes
A. Monitoring Project. Projects that collect and report chemical, biological and physical data about lakes to monitor trends in lake ecosystem health or collect project specific information (check only one that applies):			
1) The lake is recommended for monitoring in a Department's approved plan and currently not being monitored (new project).	5 points	5	Further understanding of phosphorus inputs needed per management plan. Project would lead to this.
2) The lake is NOT recommended for monitoring in a Department-approved plan but recent local management need has been identified, e.g. planning or management actions are being initiated or conducted that will be supported by the data to be collected.	4 points	0	Got A1
3) The project will continue a monitoring effort on a lake that is recommended for monitoring in a Department-approved plan.	3 points	0	Got A1
4) The lake is NOT recommended for monitoring in a Department-approved plan AND no planning or management actions are conducted but no data is currently available for lake.	2 points	0	Got A1
5) The project will monitor a lake that is NOT recommended in a Department-approved Plan and is of limited utility.	1 point	0	Got A1
B. Lake Education Projects. Projects that will assist management units in collecting and disseminating existing information about lakes for the purpose of broadening the understanding of lake use, the lake community, lake ecosystem conditions and lake management techniques (check all that apply):			
1) Creates a partnership between a lake organization and youth organization and implements an Adopt-a-Lake, Project WET or similar activity.	1 point	0	
2) Seeks to inform the community about a specific lake management issue, management project or creates a lake history.	1 point	1	Report will detail the role of beaver dams in general as well as how they influence the water quality of Big Arbor Vitae Lake
3) Project results will be presented to a lake organization meeting and a local unit of government.	1 point	0	
4) Project results will be presented to a lake organization meeting a local unit of government AND the general public via community forums, lake fairs, press releases, newsletter articles or signage.	1 point	0	
5) Provides information on lake ecosystems that has regional or statewide significance or audience.	1 point	0	
C. Organizational development projects. Projects that will assist management units in the formation of goals and objectives for the management of a lake or lakes (check all that apply):			
1) The project will result in the formation of management goals and objectives or a strategy for the management of a lake or lakes.	2 points	2	Project results will determine future management of the tributaries leading to the lake & better understanding of phosphorus input to lake
2) The project will provide results that assist local decision-making affecting lake management on a specific topic or issue.	1 point	1	Project will shed light on impacts of beaver dams on stream and lake water quality and provide recommendation on moving forward.
3) Provides training for management unit representatives on a topic of relevance to unit's lake management activities.	1 point	0	
4) The project will enhance the capacity or effectiveness of a lake management unit.	1 point	1	Project will provide a direction for BAVLA to take on the management of tributaries & the beaver dam.

Lake Planning Grant Priorities Small-Scale Ranking Questions	Ranking Points	Big Arbor Vitae Lake	Notes
I. D. Studies, assessments and other activities. These projects will implement or augment management goals or management plan recommendations for a lake or lakes or result in obtaining information needed to develop or refine management goals and objectives (check all that apply):			
1) Project completes an element of a comprehensive lake management plan with recommendations for implementation i.e. aquatic plant management plan, tributary monitoring/assessment, shoreland restoration plan, etc.	2 points	2	Tributary assessment recommended within management plan.
2) The project is recommended or identified as a need in a local or department resource plan.	1 point	0	
3) The project help to resolve issues and inform decision-making within the lake management unit on a specific topic.	1 point	1	Project will provide a direction for BAVLA to take on the management of tributaries & the beaver dam.
4) The project implements or tests an innovative management technique with applicability to other lakes.	1 point	1	Other lakes with beaver dams or pooled tributaries could benefit from the methodology utilized and the knowledge obtained during this study.
II. D. When ranking projects the Department shall consider the degree of public access to the lake as determined as follows:			
Lake exceeds minimum boating access requirements or meets minimum boating access requirements and the lake has significant other non-boating public access opportunities such as swimming beaches, parklands or public piers.	1 point	1	Access exceeds minimum requirements with three paved boat landings/docks and many trailer parking spaces. Also has picnic area, campground and seven resorts.
III. D. When ranking projects the Department shall consider whether this is a first-time small-scale project for a lake.			
	1 point	1	First time small scale grant.

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	Overview	
	Category	Points
The degree to which the project contributes toward a holistic set of alternatives to assist local decision-making or contributes to the formation of a strategy to enhance or maintain the quality of a lake ecosystem.	A	5 / 5
The degree to which the planning project will enhance knowledge and understanding of a lake's fish, aquatic life and their habitats.	B	1 / 5
The degree to which the planning project will enhance knowledge and understanding of a lake's watershed conditions that affect or have potential to affect a lake's ecosystem.	C	4 / 5
The degree to which the proposed planning project enhances local understanding of the lake's water quality, potential uses and factors which affect a lake's water quality.	D	4 / 7

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