Minnehaha Creek Watershed District *REQUEST FOR BOARD ACTION*

MEETING DATE: May 26, 2016

TITLE: **Authorization for funds to continue Lake Minnetonka Zebra Mussel Study**

RESOLUTION NUMBER: 16-049

PREPARED BY: Eric Fieldseth, AIS Program Manager

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REVIEWED BY: ☐Administrator ☐ Counsel ☒ Dept. Director (Name): Craig Dawson
☐ Board Committee ☐ Engineer ☒ Other: Kelly Dooley

BOARD ACTION:

☐ Advance to Board mtg. Consent Agenda.	☐ Advance to Board meeting for discussion prior to action.
☐ Refer to a future workshop (date):_____	☐ Refer to taskforce or committee (date):_____
☐ Return to staff for additional work.	☐ No further action requested.
☒ Other (specify): Recommend Approval	

PURPOSE or ACTION REQUESTED:
Authorization to enter into agreement with Blue Water Science to perform adult zebra mussel density estimates, and authorization to enter into agreements with three labs for different analysis of periphyton and bacteria samples in 15 bays of Lake Minnetonka. .

PROJECT/PROGRAM LOCATION:
Lake Minnetonka

PROJECT TIMELINE:
May – September 2016

PROJECT/PROGRAM COST:
Fund name and number: Research and Monitoring: AIS Program (5005)
Requested amount of funding: $30,000
Total Amount Budgeted: $30,000
Is a budget amendment requested? No
Is additional staff requested? No

Breakout of Requested Funds:
Adult Zebra Mussel Density Estimates: $18,400
Periphyton (Identification and Density): $7,200
Chlorophyll-*a* and Total Phosphorus Analysis of Periphyton Samples: $3,300
Heterotrophic Bacteria Sampling: $1,100

PAST BOARD ACTION:
March 22, 2012: Authorized release of funds to analyze phytoplankton and zooplankton community in the watershed district lakes for a cost not-to-exceed $11,000. Resolution Number 12-021.

March 22, 2012: Authorized release of funds to analyze 55 periphyton samples from Lake Minnetonka for a cost not-to-exceed $9,000. Resolution Number: 12-022.

March 28, 2013: Authorization to release funds to analyze 55 periphyton samples from Lake Minnetonka for a cost not-to-exceed $9,000. Resolution Number 13-030.

March 28, 2013: Authorization to release funds to analyze phytoplankton in Lake Minnetonka for a cost not-to-exceed $9,000. Resolution Number 13-031

March 27, 2014: Authorization to continue Lake Minnetonka Zebra Mussel Study in 2014. This included analysis of periphyton, phytoplankton, zooplankton and work with Blue Water Science on preparing data for publication for a total cost of not-to-exceed $25,750. Resolution Number 14-021.

May 12, 2016: Board recommended item to go to consent agenda for May 26, 2016 Board Meeting.

SUMMARY:

Zebra mussels were first found in Lake Minnetonka in 2010, and since 2011, the District has been monitoring the population and its effects on water quality within the lake. The water quality prior to zebra mussel infestation divided the water quality of the lake into three groups: Group 1 (optimal green algae levels), Group 2 (moderate green algae levels), and Group 3 (low green algae/high blue-green algae levels). Since infestation, water quality changes are evident, but it varies by group type, which dictates how rapidly zebra mussel populations increases throughout Lake Minnetonka.

In the more Eastern Bays of Lake Minnetonka, zebra mussels increased rapidly and there have been significant increases in water clarity and reductions in chlorophyll-a (which measures algae) and total phosphorus. These rapid changes can lead to changing primary production in the lake (which forms the base of the food chain) from more open water to more benthic (or bottom) environments. This has ramifications for light penetration in the lake, aquatic plant growth, macroinvertebrate production and fish distribution, and ultimately how organizations will manage Lake Minnetonka.

In 2016, Research and Monitoring staff recommend additional monitoring of adult zebra mussel density in Lake Minnetonka. Since 2011, the MCWD has been monitoring the zebra mussel population by the use of sampler plates in the lake. These sampler plates directly measure the annual zebra mussel population, what is born that year. By adding in estimates of adult densities, two outcomes will occur: (1) calculate the cumulative population and provide an actual biomass estimate of zebra mussels in the lake, (2) provide distribution of adult zebra mussels on submerged aquatic vegetation and by depth across the lake. If the adult zebra mussel densities collected in 2016 supports the sampler plate data we've been collecting, than adult densities would not need to be gathered again in the future.

In addition to the monitoring the adult zebra mussel densities, staff is recommending monitoring periphyton and bacteria communities in Lake Minnetonka. There are two outcomes with this data: (1) assess changes in the algae community in the lake, and (2) to determine if the phosphorus decline we are observing is actually just a redistribution of phosphorus in the lake to either benthic algae or into bacteria in the lake. The results of this data will have more implications in identifying ecological changes in the lake.

Recommended Contractors

BSA Environmental Services, Inc, a laboratory in Ohio, provides periphyton analyses services. They analyze the samples by identifying all the species of periphyton present as well as the quantity of each species. In 2016, staff would like to send BSA Environmental Services, Inc. 45 periphyton samples to analyze at a cost of $7,200.

Minnesota Valley Testing Laboratories, Inc, a laboratory in New Ulm, MN, provides bacteria testing. They analyze the samples for Heterotrophic bacteria by using a plate count method. In 2016, staff recommends sending Minnesota Valley Testing Laboratories 75 samples to analyze at a cost of $1,100.

RMB Environmental Laboratories, Inc, a laboratory in Detroit Lakes, MN provides lab analysis for water samples for the District. In 2016, staff recommends sending a total of 150 samples for chlorophyll-*a* and total phosphorus analysis of periphyton samples as part of this study, for a cost of not-to-exceed $3,300.

Blue Water Science is the District's partner on this research, and staff recommends contracting with them to perform the adult zebra mussel density surveys in 15 Bays for a total cost of $18,400.

RESOLUTION

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WHEREAS, Zebra mussels have been known to provide ecological effects such as increased clarity, increased aquatic vegetation, shift to more benthic algae blooms, changes in the food web and possible shifts in fish communities, but much of these changes are from research in the Great Lakes or observations elsewhere, and have not been well documented in inland lakes of MN;

WHEREAS, Lake Minnetonka provides a unique laboratory for this research with its varied water quality in different bays;

WHEREAS, 5 years after the infestation was discovered, the study has found water quality conditions will dictate how fast zebra mussel populations grow, and has documented water quality changes in the Eastern Bays of the lake;

WHEREAS, Continued data collection of the zebra mussel population and water quality data will lead to the ecological impact these changes are providing, and start leading towards long-term impacts in the lake from zebra mussels;

WHEREAS, The 2016 Budget and Work plan identifies $30,000 to continue the Lake Minnetonka Zebra Mussel Study

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers hereby authorizes the District Administrator to enter into agreement with BSA Environmental Services Inc. to analyze periphyton samples from Lake Minnetonka for a cost not-to-exceed $7,200.

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers hereby authorizes the District Administrator to enter into agreement with Minnesota Valley Testing Laboratories to analyze bacteria samples from Lake Minnetonka for a cost not-to-exceed $1,100.

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers hereby authorizes the District Administrator to enter into agreement with RMB Environmental Laboratories to analyze Chl-a and Total Phosphorus from periphyton samples for a cost not-to-exceed $3,300.

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers hereby authorizes the District Administrator to enter into agreement with Blue Water Science to perform adult zebra mussel density surveys in 15 bays for a cost not-to-exceed $18,400.

Resolution Number 16-049 was moved by Manager _____, seconded by Manager ____. Motion to adopt the resolution _ ayes, _ nays, _ abstentions. Date: May 26, 2016.

_____ Date:_____

Secretary