MEMORANDUM
To: Board of Managers, LMRWMO
CC: Joe Barten, LMRWMO Administrator
From: Lindsey Albright, Dakota County SWCD Water Resource Specialist
Date: April 5, 2017
Subject: Lake Augusta - 2016 Citizen Assisted Monitoring Program (CAMP) Results

Background
Lake Augusta is a 46 acre lake located in the City of Mendota Heights. The lake has a median depth of 18 feet and a maximum depth of 33 feet. Land use within the watershed is primarily institutional (cemetery), commercial, and residential (low and high density). Lake Augusta was placed on Minnesota’s 303(d) List of Impaired Waters in 2010 for aquatic recreation due to excess nutrients. Historical monitoring of Lake Augusta was conducted by the Gun Club Watershed Management Organization from 2007 until 2009 (total phosphorus and chlorophyll-a). Secchi depth measurements began in 1998 and continued through 2009.

In 2012 and 2013, the Minnesota Pollution Control Agency (MPCA) led an intensive water monitoring effort (Watershed Restoration and Protection Strategy (WRAPS)) of Lake Augusta to gain a better understanding of water quality, sources of pollution, and the necessary pollution reductions to improve the water quality and meet State standards.

The WRAPS process identified that a 78% reduction of phosphorus in Lake Augusta from internal sources would be needed to restore the poor water quality in the lake. In order to reduce internal sources that significantly, an in-lake alum treatment of the lake sediments was recommended to the Lower Mississippi River Watershed Management Organization as a proper course of action.

2016 Water Quality Monitoring Activities
In the summer of 2016, monitoring for eutrophication parameters (chlorophyll-a, total phosphorus, and Secchi disk transparency) took place on a biweekly schedule starting in mid-June and continuing through early-September though the Citizen Assisted Monitoring Program (CAMP). This was done to gain supplemental data on the state of the waterbody prior to an alum treatment to be used for comparison with water quality post project. The historical monitoring location used by both the Gun Club Watershed Management Organization and the MPCA during the WRAPS project was used for monitoring in 2016.

Additional water quality parameters recorded: water color and odor; atmospheric conditions (wind, cloud cover, air temperature); water surface and lake level; aquatic plants; algae; and suitability for recreation.

2016 Monitoring Results
Water quality was monitored on Lake Augusta seven times between June and September. Water clarity was determined using a Secchi disc, while water samples were collected and subsequently analyzed for total phosphorus and chlorophyll-a (field filtered). In 2016, Lake Augusta did not meet any of the deep lake water quality criteria set forth by the MPCA.
The 2016 water monitoring results for Lake Augusta were evaluated against the deep lake criteria set for lakes in the North Central Hardwood Forest (NCHF) Ecoregion.

Upper limits of the threshold are indicated by the green dashed line:
- > 1.4 m Secchi depth
- < 40 µg/L TP
- < 14 µg/L Chl a

The purple diagonal column on the right side of each graph shows the summer average for each parameter.