Memo

CITY OF Ames
WATER & POLLUTION CONTROL

PKTS. 7/12/19

y Council

or John R. Dunn

Date: July 1, 2019

Subject: **Summary of Ada Hayden Water Quality Monitoring**

On May 9, 2017, the City Council awarded a two-year contract for water quality monitoring of the lakes at Ada Hayden Heritage Park to the State Hygienic Laboratory at the University of Iowa (SHL).

Monitoring of the lakes is included as a part of the Capital Improvements Plan for the Water and Pollution Control Department. The long-range budgeting for that Plan includes a round of monitoring of the lakes at Ada Hayden on five- to seven-year intervals. Each round of monitoring is planned to be conducted over two consecutive summers. The rationale behind this monitoring schedule was that the year-to-year fluctuations in the data can be too significant to be able to draw any long-term conclusions; there is too much "noise" in the data. By averaging the results from two consecutive years and then comparing the results every five to seven years, the year-to-year fluctuations can be dampened, allowing trends to be more easily discerned.

The study found that the overall water quality is as good as, or better than, statewide values published by the Iowa Department of Natural Resources. They also found no significant changes in water quality over the past 18 years.

Attached is a summary of the investigation and conclusions provided by SHL. The full text of the report, including data and trends, is available on the City's web site at this URL:

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https://www.cityofames.org/government/departments-divisions-i-z/water-pollution-control/ada-hayden-water-quality-monitoring

Water Quality Sampling at Ada Hayden Heritage Park
Summary of Results

Water quality monitoring was conducted at Ada Hayden Heritage Park during the spring, summer, and fall of 2017 and 2018 by the State Hygienic Laboratory at the University of Iowa. Samples were collected from the north and south cells of Ada Hayden Lake, the three wetlands that discharge to the lake, and the lake outlet. More than 300 samples were collected and analyzed for 27 different parameters during the two-year study period.

Average concentrations of ammonia-nitrogen, chlorophyll *a*, *E. coli*, total Kjeldahl nitrogen, orthophosphate, total suspended solids, total volatile suspended solids, and turbidity were generally less than or equal to the statewide median value reported by the Iowa Department of Natural Resources (IDNR) (https://programs.iowadnr.gov/aquia/Programs/Lakes). The average trophic state indices, an indicator of the level of nutrients and algal productivity, were also less than the statewide average reported by the IDNR.

Ada Hayden Lake was previously sampled by the Iowa State Limnology Laboratory from 2001 to 2006 and in 2009 and 2010. **A comparison of data collected by the State Hygienic Laboratory and the Iowa State University Limnology Laboratory showed that the concentrations of nutrients and solids have not changed significantly since 2001.** Although the results for some parameters appeared to trend up or down over time, none of the trends were statistically significant.

The three wetlands studied (see the map on the following page) intercept surface water and storm water runoff before they enter the lake. All three wetlands were found to reduce the amount of total nitrogen entering the lake. The north wetland complex was also found to reduce the amount of phosphorus, solids, and turbidity entering the lake. Adversely, water flowing from the middle and south wetlands increased the amount of total phosphorus, solids, and turbidity delivered to the lake. This increase in solids and turbidity may have been due to an increase in the amount of algae as water passed through the wetlands, as demonstrated by a corresponding increase in the chlorophyll *a* concentration.

Overall, we found that Ada Hayden Lake is a healthy lake that is similar to other Iowa lakes and that the overall water quality of the lake has changed little over time. For more information, please contact Dustin Albrecht (City of Ames Water & Pollution Control Department) at 515-239-5150 or Jim Luzier (State Hygienic Laboratory) at 515-725-1638.