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Lab Report No. 22836

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Project Description: Pond Samples, NW Corner, West Central; Samples dated 8/15/23
Special Analysis (2)

Test Description:

The Monitoring Analysis is an abridged series of chemical and biological tests used to identify common fouling issues within potable well systems. The tests include a limited number of chemical parameters such as pH, total dissolved solids/conductivity, and the oxidation reduction potential (ORP). The sample is also evaluated for the presence of chlorine, iron, and manganese. Biological testing is performed in an effort to quantify the total bacterial population, assess anaerobic conditions, and identify the presence of iron related bacteria or sulfate reducing organisms.

Testing Procedures:

All laboratory testing procedures are performed according to the guidelines set forth in *Standard Methods for the Examination of Water and Wastewater* as established by the American Public Health Association (APHA), American Water Works Association (AWWA), and Water Environment Federation (WEF). Corrosion analyses are performed in accordance with the guidelines as set forth by the National Association of Corrosion Engineers (NACE). In general, these methods are approved by both the Environmental Protection Agency (EPA) and AWWA for the reporting of water and/or wastewater data.

Sample collection and shipment is the responsibility of the customer, performed according to protocol and procedures defined by the laboratory in advance of the sampling event with regards to the specific project and nature of the problem.

Disclaimer:

The data and interpretations presented are based on an evaluation of the samples and submitted data. Conclusions reached in this report are based upon the data available at the time of submittal and the accuracy of the report depends upon the validity of information submitted. Any recommendations presented are based on laboratory and field evaluations of similar fouling occurrences within potable water systems. Further investigative efforts, such as efficiency testing, site inspection, video survey, or other evaluation methods may offer additional insight into the system's condition and the degree of fouling present.

Discussion:

In general, as a summary, the results do not present in areas of immediate concern that would limit the recreational use of the pond. The results are very typical for a surface water body, in Kansas, during the summer months.

In evaluating the test results, there are some issues that should be addressed moving forward. The two areas of concern include the presence of cyanobacteria and the elevated pH. The heat of August has likely caused additional concentrating of these conditions, further aggravated by the reduced amount of rainfall occurring. Increased in-flow from the fall rains should see a reduction in pH. In controlling cyanobacteria and algal blooms, combining chemical treatment with physical treatment, while reducing the nutrient influence, is advised. With the onset of fall, some of the identified biological components can still bloom while others will begin to go dormant. Proactive treatment is advised to reduce the viability and limit onset next year.

Physically, siphoning off any bloom or other means of capturing and removing accumulations will help any treatment chemicals and reduce the natural reoccurrence that can happen. Care, to include gloves and a face mask, is advised when handling these materials.

Chemically, there are a variety of compounds that can be used to treat ponds to target algae and cyanobacteria blooms. Common products include copper sulfate and hydrogen peroxide. Treatment is not difficult, but direct application of these compounds can be harmful to aquatic life if over used or applied incorrectly. Several highly rated commercial products such as Airmax Algae Defense, Crystal Plex, or Cutrine-Plus Algaecide, are designed for ease of application with limited side-effects. For health and safety, these products should be applied with the applicator wearing safety glasses, gloves, and a face mask. Following application of any treatment product, allow 24-hours before resuming normal use of the pond.

Reviewing the use of fertilizer and other lawn chemicals in the areas that impact runoff or otherwise influence the pond is advised. This does not mean that these substances need to be banned, just applied correctly and in a controlled manner.

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If we can assist further, please contact our office.

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