

## 8. Is it dangerous to add a chemical (alum) to the lake, and what will we see?

No, alum is not harmful unless ingested in very high doses. With the concentration of alum that will be present in the water, over 1.5 million gallons of water would have to be drunk in a day to be fatal. When alum is applied to the whole lake, it appears as a white milky substance for approximately 5-10 days. The alum then settles to the bottom of the lake, forming a thin, sticky layer which locks in the phosphorous and prevents it from being stirred up.

## 9. Will we lose power-boating and other uses (i.e. crew practice) on the lake?

No, the plan identifies that over 2/3 of the lake will still be open to power-boating. Even with the watercraft management alternative, the entire lake can have boating; there will simply be speed restrictions in the no-wake zone. Also, the final design of the shoreline features will ensure that the narrow areas of the lake do not become reduced in size and inhibit current uses of the lake.

## 10. Why was it necessary to implement watercraft management?

The amount of phosphorus in Carter Lake is incredibly high for a water body of this size and quality of the water is reflecting this. Carter Lake has experienced years and years of high-traffic power boating during the warm seasons. Unfortunately, the result of this activity is severe shoreline erosion and continuous stirring up of phosphorus. Placing minor restrictions on this activity is just one of the pieces needed to reduce the total phosphorus load. Additionally, it would increase the effectiveness of other alternatives, such as wetland enhancement, alum, and shoreline stabilization. Finally, restrictions can create areas of diverse habitat within the lake and provide safer zones for non-power boat users. The Council chose to implement this alternative because of the great benefits and improvements to water quality.



## 11. Where will the proposed 100 acres of no-wake zone be located and who will decide this?

The current plan does not include a recommendation for the location of the no-wake zone. Because of this the project sponsors (the City of Omaha and the City of Carter Lake) will likely determine the location. While the sponsors will make the decision, it will likely be done after discussions with interested members of the community, technical experts, and funding agencies.

## 12. What can I do on my property to help the Water Quality of Carter Lake?

In the future, there may be opportunities for homeowners to install rain gardens or other structures to control stormwater pollutants. Right now homeowners can help by reducing or even eliminating the use of phosphorus-based fertilizers, cleaning pet waste, avoid washing pollutants from driveways or lawns into the streets, and utilize "dry" clean-up techniques. Rain barrels are another alternative that a homeowner can use to reduce peaks in stormwater flows. The Information and Education (I&E) Committee are an excellent source of information on what you can do to help. Please visit the I&E station, or contact chairperson, Barb Hawkins, at Barbara.Hawkins@aquila.com.

## 13. What about the lake quantity? How can we be sure there is enough water in the lake?

Water quantity has been a long-term issue at Carter Lake. Water quantity and water quality are connected because total phosphorus, algae production, and water clarity can be influenced by low water conditions. In addition, the effectiveness of all the water quality alternatives was evaluated based on a full lake pool (elevation 969.8 to 970.8).

The Carter Lake Preservation Society is funding a test well on property near the Missouri River owned by the City of Omaha. If we find the quality and quantity of water we need near the Missouri River, the plan is to construct a new well and use some of the current piping infrastructure to bring water to the lake to help maintain it at full pool. This lake recharge project will be carried out in conjunction with the alternatives presented in the Carter Lake Watershed Plan.

For more information visit [www.carterlakepreservation.org](http://www.carterlakepreservation.org).

## I. Introduction

In 2006, the cities of Carter Lake, Iowa and Omaha, Nebraska, requested assistance from environmental agencies in addressing water quality problems at Carter Lake. At that time, a community based planning process was initiated. As part of the planning process, a voluntary council of interested citizens was formed under the name of Carter Lake Environmental Assessment and Rehabilitation (CLEAR) Council. The CLEAR Council, with assistance from numerous local and state agencies, developed a conceptual plan to address water quality concerns.



## II. Water Quality Concerns

Carter Lake is a highly productive lake that exhibits poor water clarity, high nutrient concentrations, frequent algae blooms, and periodically high bacteria. Additionally, polychlorinated biphenyls (PCBs) in fish tissue has lead to consumption advisory.

Blue green algae and their associated toxins are the primary cause for concern. Over 25 percent of the weekly samples collected from 2004 through 2007 had concentrations of toxins that exceeded beach-posting criteria. Given the nature of the problems at Carter Lake, corrective measures focused on the reduction of phosphorus, which is the driving force behind algae production. Most of the recommended corrective measures are also effective at treating other pollutants, such as bacteria.

## III. Carter Lake Vision

A visioning exercise was conducted at the second public meeting. Several vision statements developed by the public were combined to produce the following:

*"Carter Lake will be the crown jewel of the metropolitan area by being a stable, healthy ecosystem that provides for multi-use recreational activities and economic opportunities."*



## IV. Water Quality Goals

The planning process for Carter Lake was designed to result in a community-based management plan that will provide a framework for protecting water quality in Carter Lake. The qualitative goals generated by the stakeholders in the second public meeting became the foundation for quantitative water quality goals developed by the CLEAR and Technical Advisory councils. The goals pertain to protecting aquatic life and the public uses of the lake such as recreation, fish consumption, and aesthetics. In order to meet these goals, more detailed objectives for each were determined to set numerical standards.

**GOAL 1.** Achieve a "Full Support" Status for the Aquatic Life Use

**GOAL 2.** Reduce Contaminant Levels in Fish to "Safe" Levels

**GOAL 3.** Maintain a "Full Support" Status for the Recreation Use

**GOAL 4.** Maintain a "Full Support" Status for the Aesthetic Use

## V. Recommended Alternatives

The CLEAR Council, Technical Advisory Council, and Olsson Associates conducted a thorough evaluation of techniques that can be used to improve water quality at Carter Lake.



### Watershed Alternatives

- Bioretention, Bioswales/Filter Strips
- Vegetated Buffer Strips
- Wet Detention Pond
- Alum Injection Systems
- Septic Tank Inspection
- Water Quality Inlets

### In/Near-Lake Alternatives

- Wetland Enhancement/Creation
- Shoreline Stabilization
- Sediment Forebays
- Watercraft Management
- Fish Renovation
- Whole Lake Alum Treatment
- Targeted Dredging



# Frequently Asked Questions

## 1. What is the main problem with Carter Lake's water quality?

Carter Lake is considered impaired, which means the lake is not meeting the standards set by the State of Iowa and Nebraska. The main issues are the turbidity (lack of clarity) in the lake and the excessive phosphorus levels that lead to blue-green algae.

## 2. Why was the watershed management plan initiated and what would happen if we choose not to implement it?

If no action was taken, water quality in Carter Lake would continue to worsen. Nutrient concentrations naturally increase in lakes over time and these increases can be accelerated in urbanized watersheds due to runoff from rain events. As nutrients increase so does the frequency of algae blooms and the potential for more lake warnings being posted due to high concentrations of blue-green algae toxins.

In addition, the Cities of Omaha and Carter Lake have been issued permits by the States of Nebraska and Iowa, which require the entities to control the pollutants in stormwater run-off as a part of the Clean Water Act. At this time the requirements of the permits allow flexibility in meeting the limits. If the Council's proposed plan is not adopted and the condition of Carter Lake continues to deteriorate, the permits will become more prescriptive and ultimately force the improvements to be carried out. Consequently, the respective cities would need to set aside city funding to improve the condition of the lake.

## 3. Who is going to pay for all of these recommendations? Will my taxes go up?

One of the main purposes of developing this plan is to show funding agencies (i.e. EPA) that there is a desire for action to be taken on Carter Lake and provide an estimate of the associated costs. With this plan, grant money from the different funding agencies can be applied for at no expense to the community.

## 4. Who developed the plan?

After the goals and objectives were determined at the public meetings, a watershed council (CLEAR Council), comprising of members of the community and stakeholders, was formed. The CLEAR Council was educated by a team of local experts and consultants (Technical Advisory Team) on all the possible alternatives that can be implemented. The two councils worked together to formulate the most acceptable and effective plan for Carter Lake.

## 5. Will the lake be drained at any point during the implementation of the alternatives?

Because of groundwater connections, it is unlikely that the lake will ever be completely drained during this process. All proposed work will likely take advantage of periods of time when naturally low lake levels occur.

## 6. Will the lake be closed to the public at any point during the implementation of the alternatives?

Yes, there will be periods of time when the entire lake or areas of the lake will not be open to the public. Alternatives such as fish renovation, whole-lake alum application, and targeted dredging will require the lake to be closed. Furthermore, construction of the shoreline stabilization features and sediment forebays will create temporary restricted zones for the safety of the users.

## 7. With fish renovation, how long will it be before there will be fish in the lake to catch?

Shortly following the renovation, fingerlings and breeding adults will be stocked into the lake to establish the appropriate balanced fishery. By the end of the second summer following the renovation there will be plenty of 8-12" largemouth bass, 6-8" bluegill, and 12-14" channel catfish to entertain both kids and serious anglers.



## VI. Phosphorus Reductions

The total phosphorus load reduction needed to meet the goal of the Total Maximum Daily Load (TMDL) is 1,704 pounds or a 53.8% reduction from the calculated in-lake and watershed loads. If all the Watershed and In-lake Alternatives recommended were implemented, an estimated reduction of 2,155 pounds (69%) could be realized. While water quality experts were not able to quantify annual reductions for some of the alternatives, they could cumulatively account for the additional 6% reduction needed to meet the more aggressive reduction goal of 75% established by the CLEAR Council.

