EPA 303d Impaired Waters list for; phosphorus, nitrogen, algae, toxic algae, chlorophyll, PCBs, pH, ammonia, and low dissolved oxygen.
High concentrations of toxins released by blue green algae resulted in beach postings for 18 weeks through the 2004-06 recreation season. In 2007, there were beach postings for 6 weeks through the recreation season.
THE LAKE IS SICK

Diagnosis: Runoff pollution from homes, yards, businesses, streets, sidewalks, parking lots and driveways is making Carter Lake sick.

Remedy: Develop a watershed management plan to prevent runoff pollution and improve the water quality in Carter Lake.

Prescription: Watershed residents, business owners, lake users, interested citizens are invited to attend Community Based Watershed Management Planning Public Meetings to develop a Carter Lake Watershed Management Plan:

Thursday, October 5, 2006  7 p.m. – 9 p.m.
Tuesday, October 24, 2006  7 p.m. – 9 p.m.

Carter Lake Elementary School
1105 Redick Blvd, Carter Lake

Doors open at 6 p.m. ; Meeting starts at 7 p.m.

Sponsored by City of Carter Lake and City of Omaha
Cooperating Agencies: Iowa Natural Resources Conservation Service, Iowa Dept. of Natural Resources, Papio-Missouri River Natural Resources District, West Pottawattamie County Iowa Extension, University of Nebraska–Lincoln Extension in Douglas/Sarpy Counties, Nebraska Dept. of Environmental Quality, Nebraska Game and Parks Commission, Nebraska Dept. of Natural Resources, MAPA, West Pottawattamie County Soil and Water Conservation District, Omaha Public Works Dept., Omaha Parks, Recreation and Public Property Dept., and Carter Lake Preservation Society.
Community Based Watershed Planning (CBP)

is a voluntary, locally led planning process that involves social, economic, and environmental concerns over a defined geographic area (such as a watershed).
CBP

- Forms partnerships between stakeholder groups and technical resource specialists.
- Minimizes conflict!
- Emphasizes desired future conditions.
- Improves natural resource Management.
The desired outcome is a **Comprehensive Watershed Management Plan** that is **Fully Implemented**.
**Key Components**

1. A Common Vision of Desired Conditions
2. Identification and Prioritization of Concerns
3. Development and Implementation of Appropriate Steps to Adequately Address Concerns
3 KEY BENEFITS:

• Community and stakeholders are much more informed about what is happening!

• Stakeholders are actively involved in the decisions made and implementation of the plan will happen at a much higher rate!

• Projects completed are more successful!
A Community-Based Water Quality Management Plan for Carter Lake Watershed

**Project Sponsors:**
City of Carter Lake, Iowa  
City of Omaha Parks, Recreation & Public Property

**Technical Advisory Team:**
City of Carter Lake, Iowa  
City of Omaha Parks, Recreation & Public Property Department  
Nebraska Department of Natural Resources  
University of Nebraska-Lincoln Extension in Douglas/Sarpy Counties  
Iowa State University in West Pottawattamie County  
Iowa Department of Natural Resources  
USDA Natural Resources Conservation Service  
Nebraska Department of Environmental Quality  
Carter Lake Preservation Society  
Nebraska Game and Parks Commission  
West Pottawattamie County Soil & Water Conservation District  
Metropolitan Area Planning Agency  
Iowa Division of Soil Conservation  
Papio-Missouri River Natural Resources District  
City of Omaha Public Works Department

**CLEAR Water Council:**
Peter Parkert  Doug Wallingford  Julie McKillip  Pam Christiansen  
Pam Parkert  Stephanie Kelley  Merl Harder  Mike Dailey  
Les Lundberg  Bill Van Trump  Doug Dodson  Bob Hegwood  
Steve Wilbur  Hani Haider  Wayne Houston

**Project Consultant:**
Olsson Associates  
Tetra Tech
“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.”
Goals

1. Achieve a “full support” status for the aquatic life uses
2. Reduce Contamination levels in fish to “safe levels”
3. Achieve and maintain a “full support” status for the recreation use (to achieve this goal, several growing season nutrient concentration and water quality parameters reductions were set, which included a more aggressive phosphorus concentration reduction to 75 mg/L than the goal set in the TMDL of 96 mg/L)
4. Maintain a “full support” status for the aesthetic use
CARTER LAKE
Water Quality Management Plan

BRIDGING BOUNDARIES TO PROTECT THE FUTURE OF CARTER LAKE

West Pottawattamie Soil and Water Conservation District

NEBRASKA GAME AND PARKS COMMISSION
UNIVERSITY OF NEBRASKA LINCOLN EXTENSION
PAPIO-MISSOURI RIVER NATURAL RESOURCES DISTRICT
Nebraska DEQ
United States Environmental Protection Agency
City of Omaha, Nebraska Natural Waterways Commission
Carter Lake Preservation Society
Carter Lake Water Council
Carter Lake Environmental Assessment & Rehabilitation
OLSSON ASSOCIATES
DNR
MAPA
A Council of Governments
Please attend a Public Meeting to learn about and comment on the proposed Water Quality Management Plan. Learn about the plan to HEAL THE LAKE!

March 11, 2008
7:00 p.m. – 8:30 p.m.
Shoreline Golf Course Clubhouse
210 East Locust Street in Carter Lake, Iowa

Doors open at 6:30 p.m. Meeting will begin at 7 p.m.
Implementation Funding

- Iowa DNR Lake Restoration Program
- Iowa DNR Watershed Improvement section 319
- Iowa DNR Fisheries Bureau
- Iowa Dept. of Ag & Land Stewardship
- Nebraska Game & Parks Commission
- Nebraska Aquatic Habitat Fund
- Nebraska Dept. of Environmental Quality section 319
- Nebraska Environmental Trust
- Cities of Carter Lake and Omaha

- ~ $6.0 million
Water Quality Improvement Plan

- Wet Detention Basins and Secondary Forebay Treatment
- Vegetated Buffer
- Shoreline Stabilization
- Whole Lake Alum (x2) Fish Renovation
- Wetland Creation
- Watershed Stewardship Items: lawn care, rain gardens/barrels, pet waste, pervious surfaces, stormwater inlet stenciling & veg. management
- Golf Course Swale Improvements
- Targeted Dredging
- 100 acre No-Wake Zone

Legend:
- Existing Storm Sewer
- Proposed Storm Sewer
- Wetland
- Open/Deep Water
- Vegetated Buffer
- Biowale
- No Wake Zone
- Buoys
- Dredge Locations
- Rock Structures
- Geotube Structures
- Rock/Geotube Combination
Targeted dredging (88k cu yrd)

Shoreline armoring

Wetland enhancement

Other BMPs
Before renovation
After renovation
Reduce growing season in-lake total phosphorus from 153 ug/l to 75 ug/l.
Decrease growing season median chlorophyll a concentrations from 59 μg/L to 21 μg/L.
Microcystin (blue-green algae) Toxin Levels in Carter Lake

The graph shows the Microcystin toxin levels in Carter Lake from 2004 to 2012. The levels are measured in parts per billion (ppb). The green line represents the beach posting criterion of 20 ppb. The graph is divided into two sections: Pre-Implementation and Post-Implementation. The post-implementation period shows a significant reduction in toxin levels, indicated by the red circle.
Increase growing season median water clarity from 16 inches to 54 inches to meet the Iowa Lake Restoration Program Goal but not to fall below 30 inches to meet the TMDL Goal.
Clear water grows rooted aquatic plants!
All in all a very successful project

Community Based Planning played a vital role!