

# LAKE REMEDIATION STRATEGY

## Cleaning up Lake Mitchell ...Nature's Way!

### PROPOSAL:

to

**City Council of Mitchell SD**

from

**SARC Technologies Group**

**P.O Box 517; 612 Indiana Ave.**

**Platte SD 57369**

**Tel: (605) 337-9610**

**WATER**

“...the future's most important  
resource!”

# Lake Mitchell is a tremendous resource to the area...

- Recreation & Relaxation
- Back-up Water Supply
- Enhanced Community Appeal
- Increased Property Values
- Added Tax Base

...without lake remediation,  
significant property value  
will be lost!

# Similar Lakes have been cleaned up...naturally!

## Lake Platte SD, 150 acres

**A small effort produces a big result.** Lake Platte was built in the 1930's to a depth of 16 feet. The average depth TODAY is less than 4' deep.

The sportsman's club borrowed three circulation units from City Works. They hoped to keep the ice open in winter to prevent fish kill.

Sportsmen secretly wondered if they might avoid dredging?

After putting three units on the lake for 8 months, fishermen were surprised to find the entire lake had deepened by about ½ inch per month.

Area fishermen have high hopes that Sunday outings and family fishing can return to Lake Platte. By way of contrast, when nearby Lake Henry received bids of \$1 million dollars for proposed sediment removal

...Costly Dredging was no longer in the plans for Lake Platte.

# Similar Lakes have been cleaned up...naturally!

## **LAKE PAPINEAU PQ, 750 acres**

### Units in the right place do more than expected.

Three basins form Lake Papineau with shallow areas between each basin. Water flows from one basin to another. A dam and spillway across the final basin holds back water in the lake. The first basin is about 45' at its deepest point. This basin lies immediately below what was a fish farm.

Run off has always entered directly into this basin.

Three circulator units were placed near the inlet of the first basin. Incoming nutrients were circulated through the toroidal vortex created by these units.

Within six months oxygen profiles improved, transparency increased, aquatic life and fish populations rebounded.

After two years, improvement in the upper basin appears to be having beneficial effects on the other two basins further down stream. Aeration and circulation reduced the nutrient impact on the rest of the lake.

# **POINTE CALUMET LAKE PQ, 65 acres**

## **Recreation Returns to Pointe Calumet.**

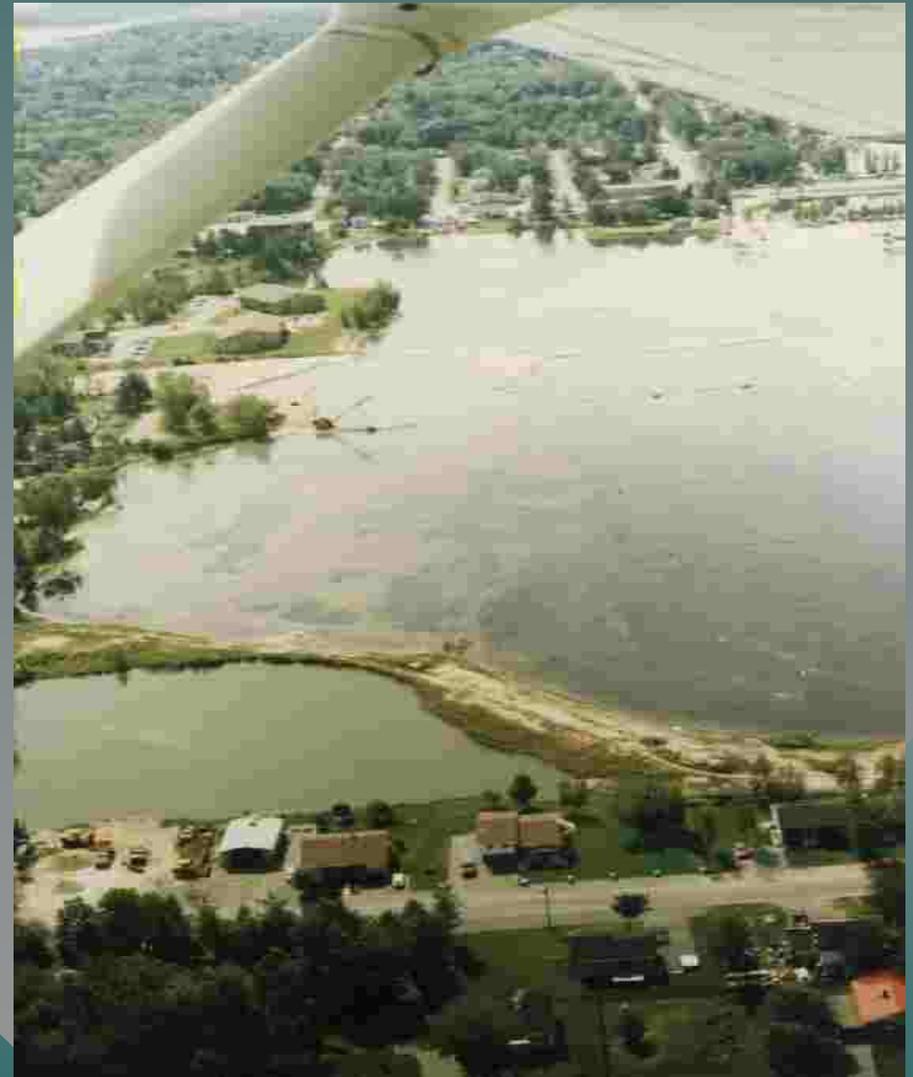
**This lake has a popular recreational waterslide.  
It is also heavily used for skiing and swimming.  
The lake became overloaded with nutrients.  
The water was brackish, slimy and smelled bad.  
Transparency was down to less than 1 meter.**

**Algae and Milfoil were widespread.  
High e-coli counts closed the beach!**

**Six circulators were installed along the edge of  
Milfoil beds encroaching on the shore.  
UV radiation from sunlight quickly reduced e-coli  
counts from 300 to 2 CFU-100ml.**

**Within a month the beach re-opened!  
Algae was gone.**

**The lake has full transparency, down 11 feet to sand.  
Swimming is a joy.  
Algae, Milfoil and brackish, slimy water are gone.  
E-coli counts remain near zero.**





*AFTER >>*  
**POINTE CALUMET**  
*<< BEFORE*



**Similar Lakes have been  
cleaned up...naturally!**

## **LAKE OUELETTE PQ, 120 acres**

**This was one of the worst lakes ever seen!**

**Lake Ouelette suffered a hog manure spill that inundated the lake. In addition the lake continued to receive run-off. Also, when it rained, ash washed into the lake from a burning sawdust pile. Four wind and three solar circulators were put on the lake.**

**In one year the lake returned to complete transparency and oxygen levels were back to normal.**

**Summer of 2005 in this region was the hottest on recorded. Many area lakes considered non-polluted became green with algae. However, water transparency in Lake Ouellette continued improving even through the hot summer conditions of 2005.**

**Lake Ouelette is dramatic proof of remediation  
accomplished in one year by oxygen and circulation alone!**

# Lake Mitchell can be cleaned up ...without chemical risk!

**Other lakes have returned to health.**

Chemical remedies are expensive & don't work well!

Even with some success, new problems often develop later.

Here is why:

- Nutrient laden sediments are not eliminated
- Years of settled nutrients remain on the bottom
- Algae, weeds flourish and add nutrients to the lake
- Ecoli and other health pathogens are not reduced
- Alum can be a risk to human health & harm fish

**Natural remedies are safe and cost much less**

*"Oxygen and Total Lake Circulation<sup>tm</sup>!"*

Nature works well...to accomplish desired goals quickly!

# Action!

## SARC RECOMMENDS

to

## Mitchell City Council:

- Start - funding a *natural remediation* program
  - Begin with a pilot project to prove results: Kippes Bay
  - Based on outcomes, draw up plans for the entire lake
- Stop - putting alum in Lake Mitchell
  - Alum has not proven visibly effective against algae
  - Amounts now suggested exceed reasonable cost
  - Risk of aluminum contamination in lake or downstream

**Natural strategies have proven effective in other lakes.**

# Benefits

**Achieve desired benefits using low cost, proven natural methods!**

- #1: Stop Algae Bloom** - Circulation quickly stops Algae
- #2: Kill Disease** - UV (sunlight) kills infectious Pathogens
- #3: Remove Nutrients** - Reverse years of sediment muck
- #4: Reduce Odor** - Oxygen prevents odor production
- #5: Avoid Rebound** - Keep aquatic plants/weeds in check
- #6: Improve Water Quality** - No added contaminants
- #7: Get Results Quickly** - See outcomes the first year
- #8: Low Cost Effort** - Systems work year after year
- #9: Nothing Visible** - Equipment is underwater
- #10 Safe Systems** - No accessible moving parts

# Pilot Project

## Submersible Circulation Equipment @ Kippes Bay

### Requirements:

10 units

(See map next)

220v hook-ups

4 visits to site

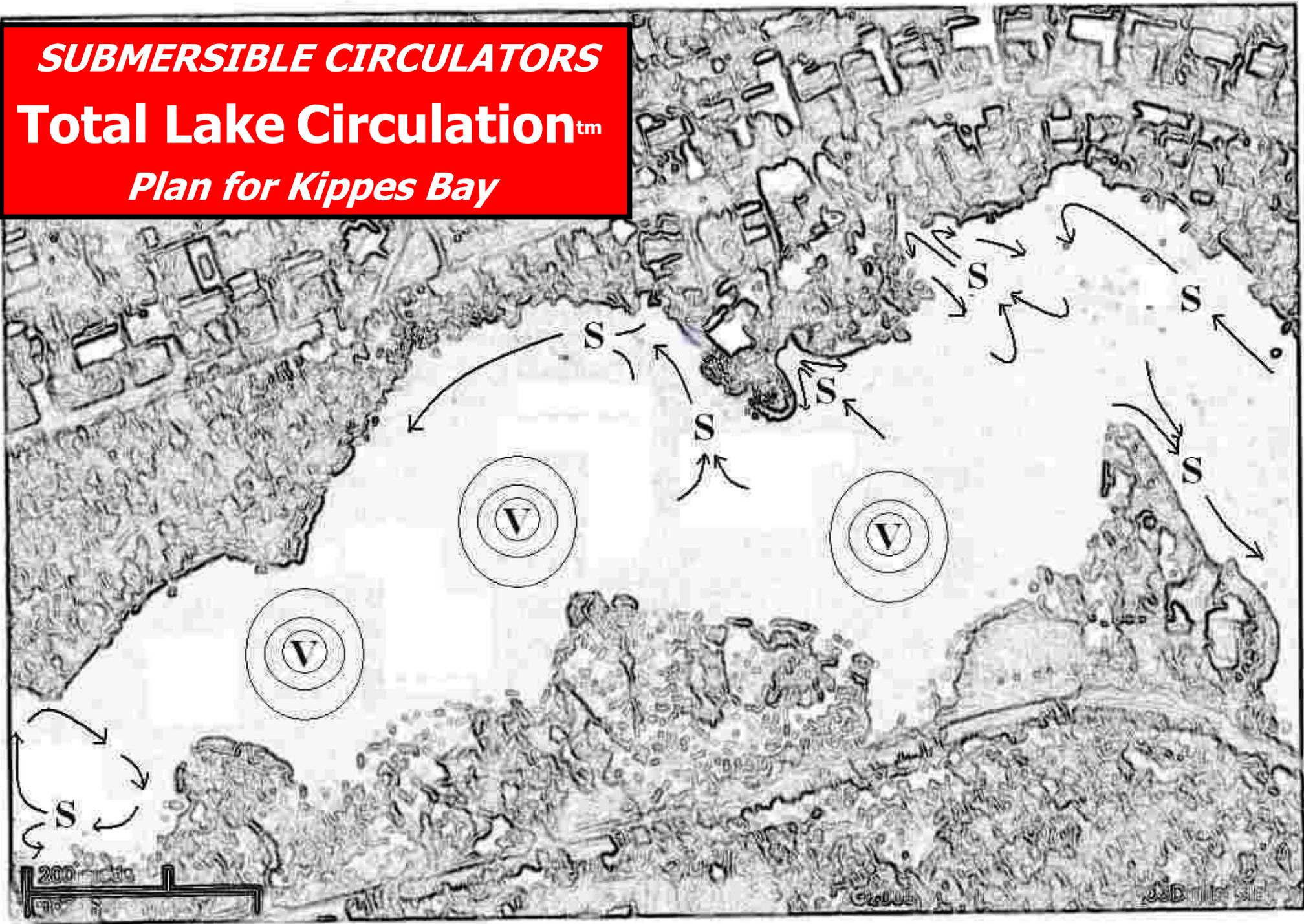
Test Water Quality

Report Monthly

6 Months to Complete

- Low, one time cost
- Easily installed & maintained
- Move as conditions change
- Low power consumption
- Units work year after year
- No noise, nothing visible
- Completely safe

***SUBMERSIBLE CIRCULATORS***  
**Total Lake Circulation™**  
*Plan for Kippes Bay*



***SUBMERSIBLE CIRCULATORS***  
**Total Lake Circulation™**  
*At Work - 18' Deep*



# SUMMARY

**Begin a *natural remediation* program.**

**Start pilot project @ Kippes Bay.**

**Based on results, prepare plans for the whole lake.**

**Timeframe:**

**Pilot: 6 months**

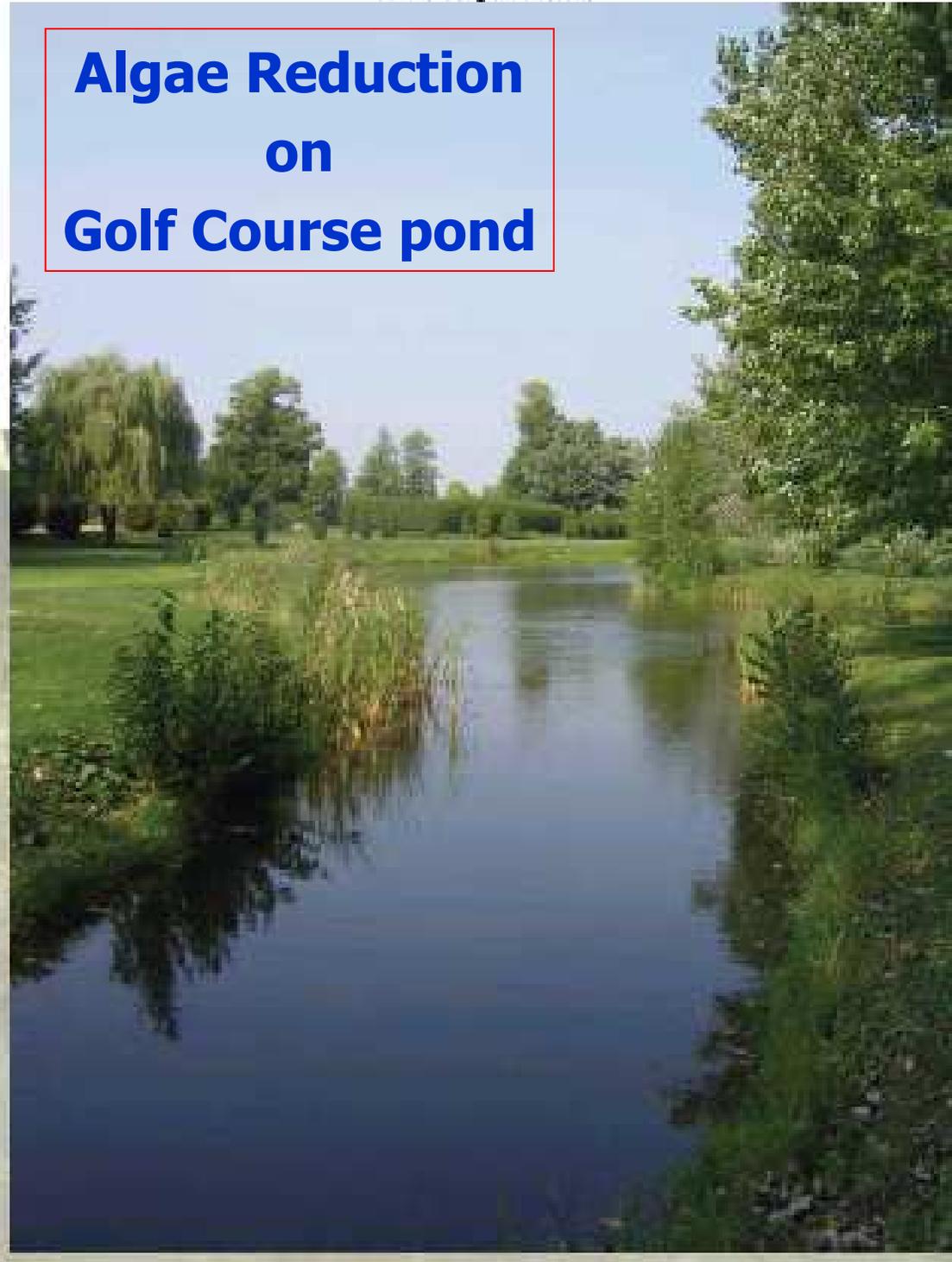
**Whole Lake: 1-2 years**

Before



20 day after

**Algae Reduction  
on  
Golf Course pond**





*AFTER >>>*  
**POINTE CALUMET**  
*<<< BEFORE*

