

**ANALYSIS OF**

**LONG LAKE, SANBORN COUNTY**

**SOUTH DAKOTA**

**JANUARY 2009**

**South Dakota**  
**Department of Environment and Natural Resources**  
**Division of Environmental Services**  
**Pierre, South Dakota**

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## **Executive Summary**

Name/Location of Waterbody: Long Lake, Sanborn County.

Boundary of Waterbody: Long Lake is located in Sections 2, 11, & 12, Township 106 North, Range 62 West, Sanborn County, South Dakota.

Recommendation: It is recommended that Long Lake be removed from Administrative Rules of South Dakota (ARSD) Chapter 74:51:02:58, Sanborn County, uses of certain lakes. The (6) Warmwater marginal fish life propagation waters, (7) Immersion recreation waters, and (8) Limited contact recreation waters beneficial use designations are not appropriate due to fundamental physical conditions. Long Lake does not maintain sufficient water to support a fishery or recreation designation and functions more like a wetland than a lake.

The (9) Fish and wildlife propagation, recreation, and stock watering waters, beneficial use designation continues to be appropriate for Long Lake and will be maintained.

## **Introduction**

On a triennial basis, the South Dakota Department of Environment and Natural Resources (DENR) conducts a review of surface water quality standards and waterbody beneficial uses as required by the Clean Water Act.

## **Site Description**

Near Woonsocket, Sanborn County, several ditches have historically been excavated in order to provide adequate drainage to the relatively flat landscape. County Ditches #8 & #21 provide drainage to the south and east of Woonsocket. These ditches converge and flow into Long Lake. Another excavated drainage ditch, County Ditch #14, provides an outlet from Long Lake and flows approximately seven miles to the James River.

## **Results/Discussion**

In 1990, DENR personnel sent a survey to GF&P regional fisheries managers and conservation officers requesting information on uses of area lakes to determine if the lake should be classified with greater beneficial uses. Attachment 6 is a copy of the completed survey for Long Lake. DENR personnel used the information in the survey and made the decision in 1992 to add fishery and recreation beneficial uses to Long Lake.

In preparation for the 2008 triennial review and discussions with GF&P, DENR has determined that Long Lake was added to ARSD Chapter 74:51:02:58 in error. The results of the survey do not conform to DENR guidelines to assign fishery or immersion recreation beneficial uses or to GF&P guidelines to manage a waterbody as a fishery. The survey indicates that the primary use of Long Lake is waterfowl hunting, not fishing or swimming. When Long Lake holds water, the average depth is noted as approximately three feet. Three feet is not an adequate depth to

maintain a fishery in a lake and does not provide refuge against summer heat or winter ice. The survey also indicates that the Long Lake routinely goes dry, and that fish are only present during high water times. There are no swimming beaches, and the lake is only accessible to the public along 400<sup>th</sup> Avenue. The abundance of aquatic macrophytes along the shoreline and throughout the lake does not provide a hospitable environment for immersion recreation activities. It appears that Long Lake currently functions more as a wetland or low-lying depression, than a functional lake environment.

South Dakota Department of Game, Fish, & Parks (GF&P) manages Long Lake as a Game Production Area. A Game Production Area is state land that is managed by GF&P for the production and maintenance of all wildlife species. According to GF&P land managers, the lake is choked with cattails and routinely goes dry (Todd St. Sauver, SD GF&P, personal communication). There is not an adequate quantity or depth of water to sustain a fishery or to justify the expenditures of stocking and managing Long Lake as fishery. GF&P does not manage Long Lake as a fishery for these reasons.

DENR personnel visited Long Lake on April 24 & 25, 2007, (during the spring rain season) to collect water quality samples, field measurements, and fish. Site #1 on the northwest edge of Long Lake was sampled and photographed; Sites #2 & #3 were only photographed. Water quality samples and field measurements at Site #1 indicate water meets water quality criteria for the current beneficial uses; however, the water is high in phosphorus. High amounts of phosphorus may lead to algae blooms and resulting fish kills.

DENR personnel set a fyke net overnight at Site #1. There were no fish collected in the net and no fish of any type were observed in the water. DENR personnel visited with the landowner at Site #1. The landowner stated that her son had caught bullheads years ago when the lake level was high and conditions were much different than today, but that in some years, the wetland dries up completely, and her husband has swathed the reeds for hay. Attachment 1 is a site map of Long Lake. Attachments 2 and 3 are photographs of Long Lake at Site #1 on 233<sup>rd</sup> Street. Attachment 4 is a photograph at Site #2 on 234<sup>th</sup> Street, and Attachment 5 is a photograph of Site #3 on 400<sup>th</sup> Avenue. Attachments 7 and 8 are surface water quality and field measurement results. DENR notes that these observations were made during the spring rain season, and predicts that this represents some of the best conditions expected at Long Lake.

## **Conclusion**

Long Lake was a meandered lake in Sanborn County that was added to ARSD Chapter 74:51:02:58 in 1992. Long Lake has been highly impacted by the county drainage ditches, which prevent Long Lake from storing water at historic levels. Long Lake does not support the assigned beneficial uses on a regular basis due to the current physical characteristics of the waterbody. Long Lake appears to be more of a functional wetland than a lacustrine ecosystem. Long Lake is inundated with aquatic macrophytes and has periods where the waterbody dries up completely. In addition, GF&P manages Long Lake as a Game Production Area, and does not believe that Long Lake can support a fishery. DENR recommends that Long Lake be removed from ARSD Chapter 74:51:02:58, Sanborn County, uses of certain lakes. The (6) Warmwater marginal fish life propagation waters, (7) Immersion recreation waters, and (8) Limited contact

recreation waters beneficial use classifications are not appropriate. The (9) Fish and wildlife propagation, recreation, and stock watering waters, beneficial use designation is appropriate for Long Lake.

## **Reference Documents**

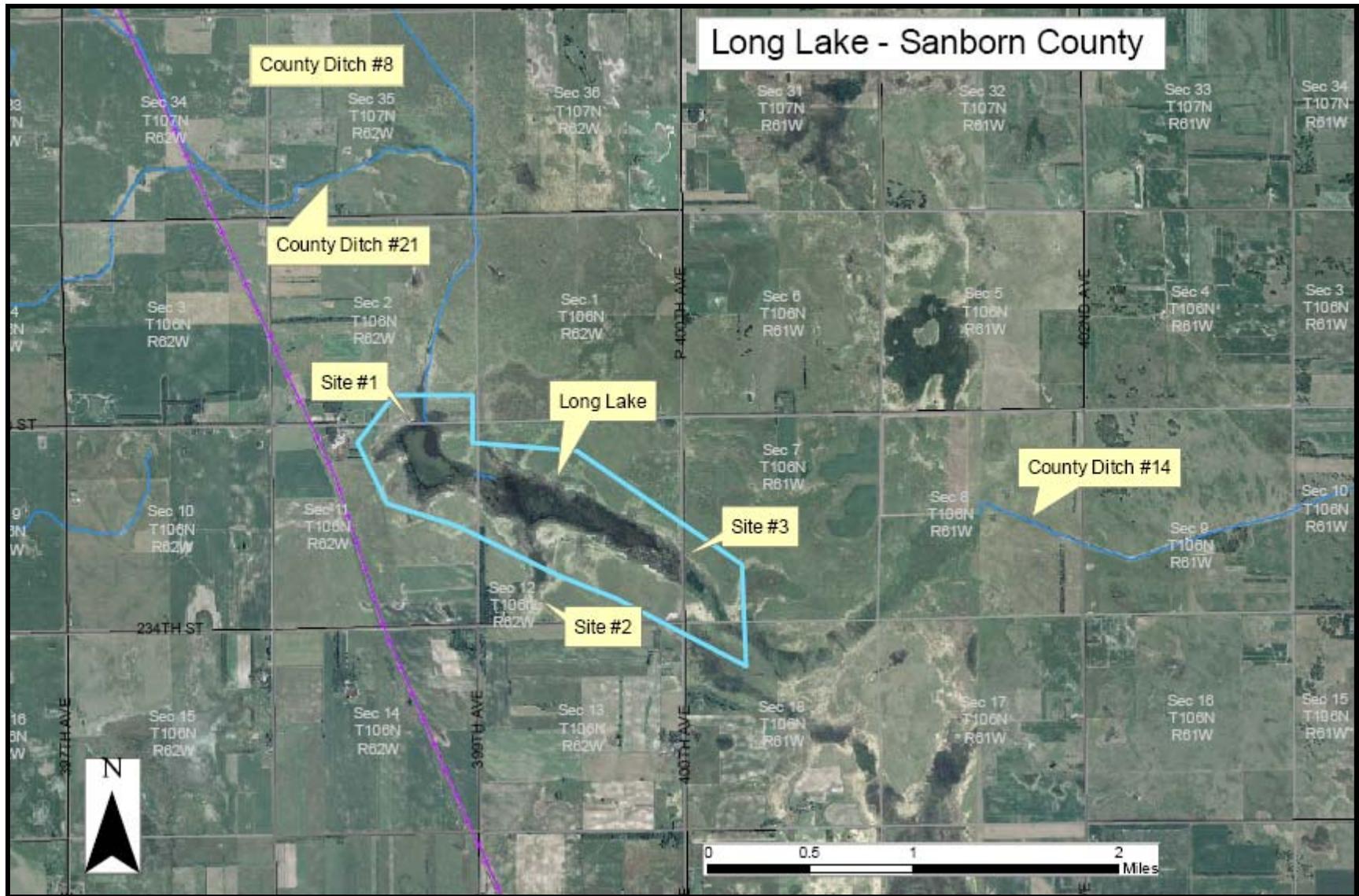
South Dakota Department of Environment and Natural Resources. 1999. Recommended Procedures for Reviewing Beneficial Use Designations, With Special Emphasis on Fishery and Recreational Uses.

South Dakota Department of Environment and Natural Resources. Chapters 74:51:01, 74:51:02, and 74:51:03, Surface Water Quality Standards.

DeLorme, 2004. South Dakota Atlas and Gazetteer.

South Dakota Bureau of Information and Telecommunications, GIS ArcMap.

# ATTACHMENT 1



## ATTACHMENT 2



### **Long Lake Site #1 on 233<sup>rd</sup> Street.**

This photograph was taken on April 24, 2007. The photographer was facing southeast. Due to spring runoff, the lake had high levels of water; however, the sampler in the photograph is far out into the water, yet standing in less than two feet of water.

## ATTACHMENT 3



**Long Lake Site #1 on 233<sup>rd</sup> Street.**

This photograph was taken on April 24, 2007. The photographer was facing east. Note the abundance of the previous season's aquatic macrophytes within the waterbody.

## ATTACHMENT 4



**Long Lake Site #2 on 234<sup>th</sup> Street.**

This photograph was taken on April 24, 2007. The photographer was facing north.

## ATTACHMENT 5



**Long Lake Site #3 at 400<sup>th</sup> Avenue.**

This photograph was taken on April 24, 2007. The photographer was facing northwest.

## ATTACHMENT 6

### LAKE CLASSIFICATION SURVEY

The Department of Water and Natural Resources and the Department of Game, Fish & Parks are initiating a survey to review and revise ARSD Chapter 74:03:03 USES ASSIGNED TO LAKES. Please complete this form for all waterbodies in your area that you are aware of even if no water is present, along with the uses made of those waters. Please complete the forms as much as possible and submit them to the address listed below by SEPTEMBER 15, 1990. Thank you.

SOUTH DAKOTA DEPARTMENT OF WATER AND NATURAL RESOURCES  
SURFACE WATER QUALITY STANDARDS PROGRAM  
ATTENTION: JOAN M. BORINEM  
523 EAST CAPITAL AVENUE  
PIERRE SD 57501  
(605) 773-3351

Lake Name [REDACTED] Common Name \_\_\_\_\_ Long \_\_\_\_\_  
 County Sanborn Region 3  
 Nearest Town Woonsocket Approximate size (acres) 180  
 Legal location - Section(s) 2, 11, 12 Township 106N Range 62W  
 Primary use (Circle) Drinking-Swimming-Boating-Fishing Hunting ~~Wildlife~~ Livestock-Other  
 Is there public access Yes Visitor Counts available (mandays) 42/year  
 Is an established swimming beach available No Does swimming occur No  
 Is there a boat dock or launching area No Number boats/day 0/day  
 Are there irrigation intakes in lake No Average water depth of lake 3 ft ok  
 Does this lake have a dam or an outlet control structure (which) Outlet  
 Who owns the dam NA Adjoining landowners-Priv X State X Fed \_\_\_\_\_  
 Is the lake stocked with fish No What types of fish can be found in this lake At present provides fishing during high water times.  
 Is this lake dry for any period Yes If yes, how often and how long 2/10  
 Are there any water quality problems on this lake No If yes, what are they \_\_\_\_\_  
 Additional comments Listed as a meandered water.  
 Primary use now is waterfowl hunting.

Signature Allen D. Knapp Title ARS - Fisheries  
 Address 517 W. 10th Street Phone number 339-6621  
Sioux Falls, SD 57104 Date 9-10-90  
 and Dale Gates Conservation Officer  
 Box 7 772-4855  
 Howard, SD 57349

## ATTACHMENT 7

### LABORATORY ANALYSIS PARAMETERS, METHODS, AND RESULTS

PARAMETER	METHOD / REFERENCE	RESULTS SITE #1
Fecal Coliform Bacteria (organisms/100 ml)	SM 9222 B EC	60
Alkalinity (mg/L)	EPA 160.2	105
Ammonia (mg/L)	SM 4500 NH3 H	<0.02
Nitrate (mg/L)	SM 4500 NO3 F	<0.1
Biochemical Oxygen Demand (mg/L)	5 day incubation, 20°C / EPA 405.1	4
Chloride (mg/L)	EPA 325.3	20
Hardness (mg/L)	EPA 130.2	180
Kjeldahl nitrogen (mg/L)	EPA 351.2	1.5
Phosphorus, total (mg/L)	EPA 365.2	0.443
Sulfate (mg/L)	SM 4500 SO4 F	134
Total Suspended Solids (mg/L)	SM 2540 D	8
Total Dissolved Solids (mg/L)	SM 2540 B	404

mg/L = *Milligrams per liter;*

EPA = *Environmental Protection Agency;*

< = *Not detected, followed by a number documenting the detection limit;*

ml = *Milliliter;*

SM = *Standard Method; and*

EPA = *Environmental Protection Agency.*

## ATTACHMENT 8

### FIELD ANALYSIS PARAMETERS, INSTRUMENTS, AND RESULTS

PARAMETER	INSTRUMENT / REFERENCE METHOD	RESULTS SITE #1
Temperature	Thermometer / EPA 170.1	21
Air (°C)		
Water (°C)	YSI 550 Multimeter / EPA 170.1	12
Specific Conductance (umhos/cm)	YSI 550 Multimeter / EPA 120.1	606
Dissolved oxygen (mg/L)	YSI 550 Multimeter / EPA 360.1	5.7
pH (su)	YSI 550 Multimeter / EPA 150.1	8.2

mg/L       = *Milligrams per liter;*  
 su           = *Standard Unit;*  
 umhos/cm   = *Micro mhos per centimeter;*  
 SM          = *Standard Method; and*  
 EPA         = *Environmental Protection Agency.*