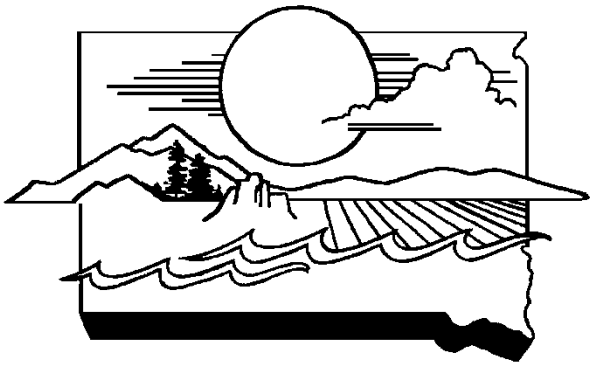
THE 2012 SOUTH DAKOTA INTEGRATED REPORT FOR SURFACE WATER QUALITY ASSESSMENT



Protecting South Dakota's Tomorrow...Today

Prepared By
SOUTH DAKOTA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

STEVEN M. PIRNER, SECRETARY

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
denr.sd.gov

March 28, 2012

James Martin, Regional Administrator
US Environmental Protection Agency, Region 8
1595 Wynkoop Street, Mail Code 8RA
Denver, CO 80202-1129

Re: Final 2012 South Dakota Integrated Report

Dear Mr. Martin:

I am pleased to submit to you, prior to the April 1, 2012, deadline, the 2012 South Dakota Integrated Report, with supporting documentation, as required under Sections 305(b) and 303(d) of the Clean Water Act.

This submittal represents a large effort by this department as well as interested members of the South Dakota public. The 2012 report is one of the most comprehensive reviews of water quality data completed in South Dakota to date.

We have provided your agency with an electronic copy of the list in addition to this submittal. It will also be available via our homepage at: http://denr.sd.gov/documents/12irfinal.pdf.

We look forward to your agency's full approval of our 2012 Integrated Report. We also want to thank members of your staff for their assistance during the development process.

Sincerely,

Steven M. Pirner
Secretary

Enclosure

cc: Vern Barry, USEPA Region 8
Liz Rogers, USEPA Region 8
Martin Hestmark, USEPA Region 8

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

APR 26 2012

Ref: 8EPR-EP

Steven M. Pirner, Secretary
Department of Environment & Natural Resources
Joe Foss Building
523 East Capitol
Pierre, SD 57501-3181

Re: The Clean Water Act Section 303(d) Total Maximum Daily Load (TMDL) Waterbody List

Dear Mr. Pirner:

Thank you for your submittal of the South Dakota Department of Environment & Natural Resources (DENR) 2012 Water Quality Integrated Report received April 3, 2012. The Environmental Protection Agency (EPA) Region 8 has conducted a complete review of the Clean Water Act Section 303(d) waterbody list (Section 303(d) list) and supporting documentation and information. The EPA has determined that South Dakota's 2012 Section 303(d) list meets the requirements of Section 303(d) of the Clean Water Act (CWA) and the EPA's implementing regulations and approves South Dakota's 2012 Section 303(d) list. The EPA's approval of South Dakota's 2012 Section 303(d) list extends to all waterbodies on the list with the exception of those waters that are within Indian country, as defined in 18 U.S.C. § 1151.

The attachment describes the statutory and regulatory requirements of the CWA Section 303(d) list and a summary of the EPA's review of South Dakota's compliance with each requirement. The EPA appreciates your work to produce South Dakota's 2012 Section 303(d) list.

If you have questions, the most knowledgeable EPA staff person is Liz Rogers and she may be reached at (303) 312-6974.

Sincerely,

Martin Hestmark
Acting Assistant Regional Administrator
Office of Ecosystems Protection
and Remediation

Attachment

cc: Shannon Minerich, SDDENR
Paul Lorenzen, SDDENR
Liz Rogers, EPA, 8-EPR-EP

Review of South Dakota's 2012 Section 303(d) Waterbody List

Attachment to letter from Martin Hestmark, Acting Assistant Regional Administrator, Office of Ecosystems Protection and Remediation, US EPA, Region VIII to Steven M. Pirner, Secretary South Dakota Department of Environment & Natural Resources

Date of Transmittal Letter from State: March 28, 2012
Date of Receipt by EPA: April 3, 2012

I. Introduction

South Dakota Department of Environment & Natural Resources (DENR) submitted their final 2012 Integrated Report (IR) to the Environmental Protection Agency (EPA) on March 28, 2012. Based on our review of the State's CWA Section 303(d) water body list ("Section 303(d) list"), EPA is approving South Dakota's 2012 list. The purpose of this review document is to describe the rationale for EPA's approval.

In March 2011, EPA issued guidance for integrating the development and submission of 2012 Section 305(b) water quality reports and Section 303(d) lists of impaired waters. This guidance, and previous EPA guidance, recommends that states develop an Integrated Report of the quality of their waters by placing all waters into one of five assessment categories. By following this guidance, Category 5 of the Integrated Report is the State's Section 303(d) list. EPA's action in review and approval of this document is only on Category 5 that comprises the Section 303(d) list within the Integrated Report.

EPA reviewed the methodology used by the State in developing the Section 303(d) list and the State's description of the data and information it considered. EPA's review of South Dakota's 2012 Section 303(d) list is based on EPA's analysis of whether the State reasonably considered existing and readily available water quality-related data and information and reasonably identified waters required to be listed.

South Dakota's 2012 list is considered an update of the State's 2010 list, and as such, the Section 303(d) list EPA is approving today is comprised of 155 assessment units (207 waterbody/pollutant combinations), compared with 163 assessment units included on the 2010 list. States may add and take waters off their Section 303(d) lists based on several factors. For the 2012 cycle, South Dakota removed 69 waterbody/pollutant combinations from its year 2010 list.

II. Statutory and Regulatory Background

A. Identification of Water Quality Limited Segments (WQLSs) for Inclusion on Section 303(d) List

Section 303(d)(1) of the CWA directs states to identify those waters within its jurisdiction for which effluent limitations required by Section 301(b)(1)(A) and (B) are not stringent enough to implement any applicable water quality standard, and to establish a

priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters. The Section 303(d) listing requirement applies to waters impaired by point and/or nonpoint sources, pursuant to EPA's long-standing interpretation of Section 303(d).

EPA regulations implementing Section 303(d) require states to identify water quality limited segments (WQLSs) that need TMDLs. 40 C.F.R. § 130.7(b). WQLSs[1] are defined in regulation as segments "where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology-based effluent limitations required by sections 301(b) and 306 of the Act." 40 C.F.R. § 130.2(j). Thus, states do not need to list waters where the following controls are adequate to implement applicable standards: (1) technology-based effluent limitations required by the CWA; (2) more stringent effluent limitations required by state or local authority; and (3) other pollution control requirements required by state, local, or federal authority. (40 C.F.R. §130.7(b)(1).)

B. Consideration of Existing and Readily Available Water Quality-Related Data and Information

In developing Section 303(d) lists, states are required to assemble and evaluate all existing and readily available water quality-related data and information, including, at a minimum, consideration of existing and readily available data and information about the following categories of waters: (1) waters identified as not meeting designated uses, or as threatened, in the State's most recent CWA Section 305(b) report; (2) waters for which dilution calculations or predictive modeling indicate nonattainment of applicable standards; (3) waters for which water quality problems have been reported by governmental agencies, members of the public, or academic institutions; and (4) waters identified as impaired or threatened in any Section 319 nonpoint assessment submitted to EPA. (40 C.F.R. §130.7(b)(5)). In addition to these minimum categories, states are required to consider any other data and information that is existing and readily available. EPA's 1991 Guidance for Water Quality-Based Decisions describes categories of water quality-related data and information that may be existing and readily available. (See Guidance for Water Quality-Based Decisions: The TMDL Process, EPA Office of Water, April 1991.) While states are required to evaluate all existing and readily available water quality-related data and information, states may decide to rely or not rely on particular data or information in determining whether to list particular waters.

In addition to requiring states to assemble and evaluate all existing and readily available water quality-related data and information, EPA regulations at 40 C.F.R. §130.7(b)(6) require States to include, as part of their submissions to EPA, documentation to support decisions using or excluding particular data and information and decisions to list or not list waters. Such documentation needs to include, at a minimum, the following information: (1) a description of the methodology used to develop the list; (2) a description of the data and information used to identify waters; (3) a rationale for any decision not to use

[1] WQLSs may also be referred to as "impaired waterbodies" or "impairments" throughout this document.

any existing and readily available data and information 40 C.F.R. §130.7(b)(5), and (4) any other reasonable information requested by the Region.

C. Priority Ranking

EPA regulations also codify and interpret the requirement in Section 303(d)(1)(A) of the CWA that states establish a priority ranking for listed waters. The regulations at 40 C.F.R. §130.7(b)(4) require states to prioritize waters on their Section 303(d) lists for TMDL development, and also to identify those WQLSs targeted for TMDL development in the next two years. In prioritizing and targeting waters, states must, at a minimum, take into account the severity of the pollution and the uses to be made of such waters. (CWA Section 303(d)(1)(A). As long as these factors are taken into account, the CWA provides that states establish priorities. States may consider other factors relevant to prioritizing waters for TMDL development, including immediate programmatic needs such as wasteload allocations for permits, vulnerability of particular waters as aquatic habitats, recreational, economic, and aesthetic importance of particular waters, degree of public interest and support, and state or national policies and priorities. (See 57 Fed. Reg. 33040, 33045 (July 24, 1992), and EPA's 1991 Guidance).

D. Applicable Water Quality Standards

For purposes of identifying waters for the Section 303(d) list, the terms "water quality standard applicable to such waters" and "applicable water quality standards" refer to those water quality standards established under Section 303 of the Act. On April 27, 2000, EPA promulgated a rule under which the "applicable standard" for Clean Water Act purposes depends on when the relevant States or authorized Tribes promulgated that standard. Standards that States or authorized Tribes have promulgated before May 30, 2000 are effective upon promulgation by the States or authorized Tribes. Standards that States or authorized Tribes promulgated on or after May 30, 2000 become effective only upon EPA approval. 40 C.F.R §131.21(c). EPA interprets CWA Section 303(d) to require EPA establishment or approval of section 303(d) lists only for impairments of waters with Federally-approved water quality standards.

III. Analysis of South Dakota's Submission

A. Background

In reviewing South Dakota's submittal, EPA first reviewed the methodology used by the State to develop their 2012 Section 303(d) list in light of South Dakota's approved water quality standards, and then reviewed the actual list of waters. The State's Assessment Methodology starts on Page 23 of the Integrated Report. EPA has reviewed the State's submission, and has concluded that the State developed its Section 303(d) list in compliance with Section 303(d) of the CWA and 40 C.F.R. §130.7. EPA's review is based on its analysis of whether the State reasonably considered existing and readily available water quality-related data and information and reasonably identified waters required to be listed. South Dakota considered all data and information pertaining to the categories under 40 C.F.R. §130.7(b)(5), and properly listed WQLSs under 40 C.F.R. §130.7(b)(1).

In previous guidance, EPA recommended that states develop an Integrated Report of the quality of their waters by placing all waters into one of five assessment categories. (See EPA's Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act, July 21, 2005.) By following this guidance, Category 5 of the Integrated Report is the State's Section 303(d) list. EPA's action in review and approval of this document is only on Category 5 that comprises the Section 303(d) list within the Integrated Report.

The State's list was submitted to EPA Region 8 enclosed with correspondence dated March 28, 2012 from Steven M. Pirner, Secretary, Department of Environment & Natural Resources, in a document entitled "*Final 2012 South Dakota Integrated Report (2012 Integrated 305(b) and 303(d) Report).*"

The year 2012 Integrated Report submitted to the EPA from the South Dakota DENR consisted of the following portions that are necessary for the Section 303(d) waterbody list:

- **Waterbodies and corresponding pollutants that make up the State's Section 303(d) list** (See Appendix D, Pages 190-198: 303(d) List of South Dakota's Impaired Waters Requiring TMDL studies).
- **Prioritization of waterbodies for TMDL development** (See Appendix D, Pages 190-198: 303(d) List of South Dakota's Impaired Waters Requiring TMDL studies).
- **Identification of waters targeted for TMDL development over the next biennium** (See Appendix D, Pages 190-198: 303(d) List of South Dakota's Impaired Waters Requiring TMDL studies).

EPA's approval action of South Dakota's year 2012 Section 303(d) list extends only to the items listed immediately above.

The 2012 Section 303(d) waters are found in the State's Integrated Report, Appendix D (303(d) List of South Dakota's Impaired Waters Requiring TMDL studies). Appendix D contains the following information for each waterbody: assessment unit identifier, waterbody name and location, cause of impairment ("pollutant"), cycle first listed, TMDL Priority, and TMDL Schedule.

B. Identification of Waters and Consideration of Existing and Readily Available Water Quality-Related Data and Information

EPA has reviewed South Dakota's description of the data and information it considered for identifying waters on the Section 303(d) list. EPA concludes that the State properly assembled and evaluated all existing and readily available data and information, including data and information relating to the categories of waters specified in 40 C.F.R. §130.7(b)(5) and properly identified and listed WQLSs as required by 40 C.F.R. §130.7(b)(1). In particular, the State relied on information from the 2012 Section 305(b) water quality assessments, assessments performed under the CWA Section 319 non-point source program, as well as data and information obtained through an extensive process to solicit information from state, federal and citizen sources. The State's evaluation of data and information in each of these categories is described below.

• *Waters identified by the state in its most recent section 305(b) report as "partially meeting" or "not meeting" designated uses or as "threatened"* (40 C.F.R. §130.7(b)(5)(i)): South Dakota produced a 2012 Integrated Report consistent with EPA's guidance regarding combined CWA 305(b) reports and 303(d) lists. EPA concludes that South Dakota made listing decisions using all existing and readily available data and information, in development of its 2012 Section 303(d) waterbody list.

• *Waters for which dilution calculations or predictive models indicate non-attainment of applicable water quality standards* (40 C.F.R. §130.7(b)(5)(ii)): South Dakota assembled and evaluated information from past and anticipated dilution calculations and predictive modeling. EPA concludes that South Dakota properly considered waters for which dilution calculations or predictive models indicate nonattainment of applicable water quality standards in development of its 2012 Section 303(d) waterbody list.

• *Waters for which water quality problems have been reported by local, state, or federal agencies; members of the public; or academic institutions* (40 C.F.R. §130.7(b)(5)(iii)): The State solicited data and information in preparation for the 2012 Section 303(d) list. Data and information obtained as a result of this effort were evaluated and considered. The State's submittal identified several entities that contributed data or information and responded to public comments related to assessments for individual waterbodies.

• *Waters identified by the State as impaired or threatened in a nonpoint assessment submitted to EPA under Section 319 of the CWA or in any updates of the assessment* (40 C.F.R. §130.7(b)(5)(iv)): The State's 2012 Section 303(d) list includes all waters that have data to support nonpoint source pollution impairment. South Dakota's listing approach and methodologies direct CWA Section 319 activities and resources to the highest priorities. Watershed assessments are often conducted for waterbodies that are already listed in order to collect current data to support TMDL development.

Based upon its review, EPA concludes that with regards to the waters identified in the State's 2012 Section 303(d) list, the State's process for developing that list substantially meets the requirements of 40 C.F.R. §130.7(b)(i-iv) regarding the consideration of all existing and readily available water quality-related data and information, as well as the requirements of 40 C.F.R. Part 130.7(b)(1).

C. Waters Removed from the Section 303(d) List

In addition to adding WQLSs that require TMDLs to its 303(d) list, a state may also remove waters from its list when such removal is justified. EPA has identified four reasons that justify the removal of a water from a state's 303(d) list. These are:

1. The state has prepared and EPA has approved a TMDL for the listed water.
2. The original basis for listing the water was incorrect.
3. New data or information indicates that the applicable water quality standard for the water is being met and its designated uses are fully supported.

4. The state has adopted and EPA has approved a site-specific water quality standard for the water, and the new water quality standard is being met.

A full accounting of waters removed from the State's 2010 303(d) list is provided on Page 21 and in Appendix B, Pages 174-177 of the Integrated Report. The states removal decisions and stated justifications are summarized below:

Number of Waterbody-Pollutant Combinations Removed from List	
Reason	**2010**
TMDL completed and approved by EPA	32
Original basis for listing was incorrect	6
New data or information indicate applicable WQS is being met	25
A site-specific WQS was approved by EPA and the new standard is being met	5
Other: dam breach	1
Total	69

In reviewing the State's 2012 Section 303(d) waterbody list, EPA carefully considered South Dakota's decision to remove certain waterbody-pollutant combinations from the State's 2010 303(d) list, its justification from those removals, and the methodology it used in making those decisions. EPA concludes that the removal decisions identified in the Integrated Report are based on all existing and readily available water quality-related data and information, and that the removal decisions are properly justified.

D. Priority Ranking and Schedule for Development of TMDLS for Listed Waters and Pollutants

Pursuant to the listing methodology set out in the State's submittal, South Dakota prioritized WQLSs for TMDL development into two Priority Areas: Priority 1 (Imminent human health problems; Waters where TMDL development is expected during the next two years; Waters listed for four or more causes; or Waters with documented widespread local support for water quality improvement) and Priority 2 (Waters listed for three or less causes; Waters where local support for TMDL development is expected but not documented; Waters with no evident local support for water quality improvements; or Waters where impairments are believed to be due largely to natural causes). South Dakota's TMDL prioritization strategy is fully described starting on Page 17 of South Dakota's Integrated Report.

EPA reviewed the State's priority ranking of listed waters for TMDL development, and concluded that the State properly took into account the severity of pollution and the uses to be made of such waters, as required by 40 C.F.R. 130.7(b)(4), as well as other relevant factors such as imminent human health problems or local support for water quality improvement. In addition, EPA concluded that the State listed WQLS targeted for TMDL development in the next two years, as required by 40 C.F.R. 130.7(d).

IV. Final Recommendation on South Dakota's 2012 Section 303(d) List Submittal

After careful review of South Dakota's final Section 303(d) list submittal package, EPA has determined that South Dakota's 2012 Section 303(d) list meets the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations and approves South Dakota's 2012 Section 303(d) list.

V. References

The following list includes documents that were used directly or indirectly as a basis for EPA's review and approval of the State's Section 303(d) waterbody list. This list is not meant to be an exhaustive list of all records, but to provide the primary documents the Region relied upon in making its decisions to approve the State's list.

40 C.F.R. Part 130 Water Quality Planning and Management

40 C.F.R. Part 131 Water Quality Standards

July 29, 2005, Memorandum from Diane Regas, Director, Office of Wetlands, Oceans, and Watersheds, US EPA to Water Division Directors transmitting EPA's "Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act"

October 12, 2006, Memorandum from Diane Regas, Director, Office of Oceans, Wetlands, and Watersheds entitled *Information Concerning 2008 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions.*

May 5, 2009, Memorandum from Suzanne Schwartz, Acting Director, Office of Wetlands, Oceans, and Watersheds, entitled *Information Concerning 2010 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions.*

March 21, 2011, Memorandum from Denise Keehner, Director, Office of Wetlands, Oceans, and Watersheds, entitled *Information Concerning 2012 Clean Water Act Sections 303(d), 305(b), and 314 Integrated Reporting and Listing Decisions.*

April 1991, "Guidance for Water Quality-Based Decisions: The TMDL Process," EPA 440/4-91-001.

July 24, 1992 Federal Register Notice, *40 C.F.R. Parts 122, 123, 130, Revision of Regulation*, 57 FR 33040.

August 8, 1997, Memorandum from Robert Perciasepe, Assistant Administrator for Water, US EPA, regarding "New Policies for Establishing and Implementing TMDLs."

September, 1997, Guidance from Office of Water, Headquarters, US EPA regarding "Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates" Supplement, EPA-841-B-97-002B.

November 5, 1997, Memorandum from Tudor Davies, Director, Office of Science and Technology to Water Management Division Directors entitled "Establishing Site Specific Aquatic Life Criteria Equal to Natural Background."

August 23, 1999, Federal Register Notice. *Proposed Revisions to the Water Quality Management and Planning Regulations,* 64 FR 46012.

April 27, 2000, Federal Register Notice, *EPA Review and Approval of State and Tribal Water Quality Standards*, 65 FR 24641

February 28, 2012, letter from Elizabeth Rogers, Monitoring and Assessment Team, Water Quality Unit, Ecosystems Protection Program, US EPA Region VIII, to Shannon Minerich, Surface Water Quality Program, South Dakota Department of Environment and Natural Resources.

SOUTH DAKOTA WATER QUALITY
WATER YEARS 2006-2011 (streams) and
WATER YEARS 2001-2011 (lakes)

The 2012 South Dakota Integrated Report
Surface Water Quality Assessment

By the State of South Dakota

Pursuant to
Sections 305(b), 303(d), and 314 of the
Federal Water Pollution Control Act

South Dakota Department of Environment and
Natural Resources

Steven M. Pirner, Secretary

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I. INTRODUCTION

This integrated 305(b) and 303(d) report (Integrated Report) was prepared by the South Dakota Department of Environment and Natural Resources (DENR) pursuant to Sections 305(b), 303(d), and 314 of the Federal Water Pollution Control Act (P.L. 95-217).

The 305(b) report in previous years provided an assessment of the quality of South Dakota's water resources and summarized state programs established to prevent and control water pollution. The 303(d) report identified impaired waterbodies within South Dakota that require the development of Total Maximum Daily Loads (TMDLs). DENR routinely used the 305(b) report to create the 303(d) impaired waterbody list.

This document combines the 305(b) report and 303(d) list into one Integrated Report, which provides an assessment of the quality of South Dakota's surface water resources and identifies the impaired waterbodies that need TMDLs. It is the intent of this report to inform the citizens of South Dakota and the United States Environmental Protection Agency (EPA) of the condition of state surface water resources and to serve as the basis for management decisions by government and other entities for the protection of surface water quality.

EPA will use the information from the Integrated Report to document the State's progress in meeting and maintaining Clean Water Act goals for the ecological health of the nation's surface waters and their domestic, commercial, and recreations uses. DENR will use the information in this report along with population data, economic analyses, program capability assessments, and other appropriate information to plan and prioritize water pollution control activities.

DENR will also use the Integrated Report as a tool to continue to stimulate development of nonpoint source (NPS) projects and to produce a priority waterbody list for the department. The Integrated Report will be available to all state conservation districts and water development districts. Each district can review watershed information for its geographical area of interest. This helps the districts focus on the location, nature, and discussions, which start the long process toward nonpoint source pollution control implementation.

This report is shared with the Nonpoint Source Task Force to help focus its efforts and provide information used in the priority waterbody ranking system. The Nonpoint Source program also uses this document to supplement news articles released through the DENR Information and Education program.

The surface water quality assessments listed in this report rely primarily on the analyses of data generated by the DENR, the United States Geological Survey (USGS), United States Army Corp of Engineers (USACE), United States Bureau of Reclamation (BOR), water quality data submitted by Wharf Resources, and the cities of Watertown, Huron, and Sioux Falls, and best professional judgment. While this assessment is as comprehensive as resources permit, some of the state's surface water quality problems may not be identified or documented in this report.

South Dakota Law (SDCL 34A-2-4 and 34A-2-6) authorizes the Department's Secretary to provide this assessment of current state surface water quality to the people of the State of South Dakota and EPA.

II. EXECUTIVE SUMMARY

The purpose of this report is to assess the water quality of South Dakota's water resources and to identify the impaired waterbodies that require TMDL development. This report meets the requirements of Sections 305(b), 303(d), and 314 of the federal Clean Water Act which mandates a biennial report on state water quality to Congress. This report is also intended to inform the citizens of South Dakota on the status of the quality of their water resources and to serve as the basis for management decisions by government staff and local officials for the protection of water quality. DENR will use the information in this report, along with population data, economic analyses, program capability assessments, and other appropriate sources to plan and prioritize water pollution control activities.

Surface Water Quality

South Dakota has about 9,289 miles of perennial rivers and streams (Table 1) and about 85,841 miles of intermittent streams. About 6,388 stream miles have been assessed in the past five years (October 2006 to September 2011). During this 5-year interval, 35% of assessed stream miles were found to support the assigned beneficial use; 65% did not support one or more beneficial uses. Fifty-four percent of stream miles designated for immersion recreation supported that beneficial use. DENR has listed a total of 92 different streams or stream segments as impaired and require TMDL development.

In addition to rivers and streams, South Dakota has 572 lakes and reservoirs with specific aquatic life and recreational beneficial use classifications. The four Missouri River mainstem reservoirs are not included in the total lake acres but are included in the monitored river mileage.

DENR has assessed 138 of the 572 classified lakes. The assessed lakes account for 71% of the total classified lake acreage. An estimated 66% of the assessed lake acreage was considered to support one or more beneficial uses. DENR has listed a total of 63 lakes as impaired and require TMDL development. Sediment and nutrients conveyed in surface water runoff are the main nonpoint source pollutants impacting South Dakota lakes and reservoirs.

Similar to previous reporting periods, nonsupport for fishery/aquatic life uses was caused primarily by total suspended solids (TSS) from agricultural nonpoint sources and natural origin. Nonsupport for recreational uses was primarily caused by fecal coliform and *Escherichia coli* (*E. coli*) contamination from livestock and wildlife contributions.

DENR continues to conduct chemical, physical, and biological stream surveys and ambient monitoring to assess the quality of receiving streams and to document water quality problem sources and improvements.

Table 1: Atlas

State Population 2010 Census	814,180
State Surface Area (sq. mi.)	77,047
Number of water basins (according to state subdivision)	14
Total number of river/stream miles	95,130*
Number of perennial river miles (subset)	9,289*
Number of intermittent stream miles (subset)	85,841*
Number of border river miles of shared river/streams (subset)	360**
Miles of ditches and canals (man-made waterways)	424**
Number of classified lakes/reservoirs/ponds	572
Acres of classified lakes/reservoirs/ponds	192,219*
Square miles of estuaries/harbors/bays	0
Number of ocean coastal miles	0
Number of Great Lakes shore miles	0
Acres of freshwater wetlands	1,780,859***
Acres of tidal wetlands	0
Name of border rivers: Missouri River, Big Sioux River, Bois de Sioux River.	

* Estimated from the National Hydrography Dataset (1:100,000 scale)
** (EPA, 1991)
*** National Wetlands Inventory

Wetlands

South Dakota has an estimated 1.78 million acres of small depressional wetlands with shallow water habitat. South Dakota Surface Water Quality Standards contain provisions to include wetlands as "waters of the state." DENR has assigned wetlands to the beneficial use (9) Fish and wildlife propagation, recreation, and stock watering, which provides protection under existing narrative and numeric water quality standards.

The EPA is encouraging states to develop monitoring and assessment tools to determine the ecological integrity of wetland environments. EPA currently promotes three approaches to wetland assessment each containing a different level of assessment. South Dakota State University-Natural Resources Management, in cooperation with the South Dakota Department of Game, Fish, and Parks (GF&P), developed a Level-1 and Level-2 wetland rapid assessment protocol for prairie pothole wetlands in eastern South Dakota. The South Dakota wetland rapid assessment protocol was developed for the State's Natural Heritage and Wildlife Habitat Programs (GF&P) for identifying reference wetlands, monitoring randomly selected sites, and evaluating wetland restoration efforts.

Researchers from North Dakota State University developed a Level-3 wetland assessment which included the prairie pothole region of South Dakota. An Index of Plant Community Integrity (IPCI) was used to evaluate the vegetative composition of wetlands across classification (temporary and semipermanent) and disturbance (native grass to cropland) gradients within the Northern Glaciated Plains and Northwestern Glaciated Plains ecoregions. The IPCI method can be used in South Dakota to allow the placement of wetlands into disturbance classes for ecological and mitigation needs (Hargiss et al. 2007).

Wetland drainage using subsurface drain tile is becoming a popular agricultural practice in eastern South Dakota. Agricultural producers are motivated to drain small nuisance wetlands or wet pockets in fields to increase tillable acres due to recent increases in the market value of grain. Producers enrolled in United States Department of Agriculture (USDA) programs are required to gain approval before engaging in wetland drainage practices. Natural Resources Conservation Service offices in eastern counties are currently back-logged with producers waiting for conservationists to make criteria-based wetland determinations, which establish a wetland's eligibility for drainage. Nonetheless, drain tile equipment and tiling crews have become a common site in agricultural fields, especially in the eastern tier of counties in South Dakota.

Potential environmental impacts associated with wetland drainage have become topics of concern within the natural resource management community. Main concerns involve increased nutrient transport and flow to downstream receiving waters. In addition, the loss of wetland habitat may be detrimental to wildlife, especially waterfowl and other birds that rely on these small systems during migration. Because drainage activities primarily focus on small, isolated, non-navigable wetlands, most do not fall under Clean Water Act jurisdiction or other federal protection. In South Dakota, drainage issues are extensive and therefore, managed at the county or township level.

Water Pollution Control Programs

The water quality goals of the state are to: identify water quality problems, set forth effective management programs for water pollution control, alleviate water quality problems, and achieve and preserve water quality for all intended uses.

Point Source Pollution Control (Surface Water Discharge System):
DENR continues to administer the National Pollutant Discharge Elimination System (NPDES) program in South Dakota, referred to as the Surface Water Discharge permitting program. The Surface Water Quality Program issues Surface Water Discharge permits and develops water quality-based effluent limits to ensure water quality standards are maintained.

Nonpoint Source Pollution Control:
Nonpoint Source pollution originates from diverse and diffuse sources. Nonpoint pollution controls must reflect this by wisely using resources available from various state, federal, and local organizations, plus have landowner support and participation. South Dakota primarily uses voluntary measures for the implementation of Best Management Practices (BMPs) to control NPS pollution. During the past 20 years, the program has initiated many development and implementation projects throughout the state. The Clean Water Act section 319 program is the focal point for a majority of the existing NPS control programs.

Educating the public about NPS pollution issues has been effective in prompting many landowners to voluntarily implement activities to control NPS pollution. However, the technical and financial assistance currently available is not sufficient to solve all of the NPS pollution problems in the state. Other solutions must be explored. Landowners have the capability to accomplish much if they understand the problems and the methods to solve them. Many of the solutions involve land management changes that benefit the landowner by making their lands more productive and sustainable.

A total of 92 stream segments and 63 lakes require TMDLs to address impairments. Of the total number of required TMDLs, 67% are for streams and 33% are for lakes.

Bordering State's 303(d) and 305(b) Lists

North Dakota, Minnesota, Iowa, Nebraska, Wyoming, and Montana possess waterbodies that border South Dakota. Under the authority of the Clean Water Act, states are granted the right to prevent, reduce, and eliminate pollution, and to plan the development and use of land and water resources. Under this right, states may adopt federal water quality regulations or promulgate their own. States that promulgate their own water quality standards, at minimum, must be as stringent as federal standards. States that border South Dakota often have differences in water quality criteria and/or waterbody beneficial use designations. Due to these possible differences, 305(b) and 303(d) list support determination may differ on waterbodies that border South Dakota and another state. For more specific information on a border waterbody, interested parties should contact each state.

III. SURFACE WATER QUALITY ASSESSMENT

SURFACE WATER QUALITY MONITORING PROGRAM

General Discussion

South Dakota DENR monitors surface waters in the state through an established ambient water quality monitoring program, water quality surveys, fish surveys, TMDL assessments, Surface Water Discharge permits, and state nonpoint source implementation projects. The United States Geological Survey (USGS) also conducts routine monitoring throughout the state. All data resulting from USGS monitoring efforts are available from the USGS website. DENR has entered most water quality data into the EPA data storage and retrieval (STORET) system. DENR also maintains an internal database (NR92) and will be submitting all water quality data through EPA's Water Quality Exchange to STORET in the near future.

Water samples are analyzed for physical, chemical, biological, and bacteriological parameters to provide baseline data for the determination of potential effects of point and nonpoint sources of pollution. Baseline data are also used as a management tool to determine the effectiveness of control programs on existing point and nonpoint sources and for directing future activities. Water samples can show whether or not a waterbody is meeting its assigned beneficial uses.

Water quality standards were first established for all surface waters by the state's Committee on Water Pollution in 1967. The Water Management Board completed the final steps of its most recent triennial review and revisions on March 11, 2009. The Interim Legislative Rules Review Committee approved these revisions on April 21, 2009. EPA formally approved South Dakota's water quality standards revisions on August 19, 2009. The water quality standards consist of water quality criteria necessary to protect those beneficial uses and an antidegradation policy that protects existing uses and high quality water.

DENR designates all surface waters in the state for one or more of the following beneficial uses:

(1) Domestic water supply waters;
(2) Coldwater permanent fish life propagation waters;
(3) Coldwater marginal fish life propagation waters;
(4) Warmwater permanent fish life propagation waters;
(5) Warmwater semipermanent fish life propagation waters;
(6) Warmwater marginal fish life propagation waters;
(7) Immersion recreation waters;
(8) Limited contact recreation waters;
(9) Fish and wildlife propagation, recreation, and stock watering waters;
(10) Irrigation waters; and
(11) Commerce and industry waters.

All streams in South Dakota are assigned the beneficial uses (9) and (10) unless otherwise stated in the Administrative Rules of South Dakota (ARSD) Chapter 74:51:03. Lakes listed in ARSD Chapter 74:51:02 are assigned the beneficial uses of (7) and (8) unless otherwise specified. All lakes in South Dakota are also assigned the beneficial use of (9) unless otherwise stated in the same reference (74:51:02). Table 2 contains a summary of the

established beneficial uses and a listing of numeric water quality criteria. State toxic pollutant standards for human health and aquatic life are presented in Table 3.

Fixed Station Ambient Monitoring

The DENR water quality monitoring network is currently made up of 151 stations located on various rivers and creeks within the state. Sampling stations are located within high quality beneficial use classifications, above and below municipal/industrial discharges, or within watersheds of concern. Currently, the department collects these samples on a monthly, quarterly, or seasonal basis. This type of water sampling is invaluable for monitoring historical information, natural background conditions, possible runoff events, and acute or chronic water quality problems.

Typically, grab samples are collected mid-stream, either from a bridge or by wading into the stream. Some stations may have to be sampled from the bank depending on conditions. Every station is sampled in the same manner and location each time. When the sample has been collected, the sampler immediately obtains water and air temperatures, specific conductance, pH, and dissolved oxygen measurements. Time of sample, water depth, channel width, and other visual observations are also recorded. The samples are properly preserved and transported to the laboratory for analysis. Data is uploaded into DENR's internal database.

The most commonly sampled parameters include fecal coliform, *E. coli*, hardness, alkalinity, residue (total solids, total suspended solids, total dissolved solids), pH, ammonia, nitrates, and phosphorous (total and dissolved). Several stations are sampled for sodium, calcium, and magnesium during the irrigation season. Stations located along streams that receive flows from historic Black Hills mining areas are also analyzed for cyanide, cadmium, lead, copper, zinc, chromium, mercury, nickel, selenium, silver, and arsenic. Stations along streams that receive flows from historic uranium mining or current exploration are analyzed for arsenic, barium, molybdenum, uranium, radium 226, and radium 228. Six sampling stations were added in 2009 to the area surrounding the proposed Hyperion oil refinery location. These sites are being sampled to determine background levels of contaminants and will remain to monitor ambient water quality conditions if the oil refinery is built.

Ambient station locations, descriptions, and schedules are included in Appendix C. More detailed descriptions of individual stream sites are available from DENR on request.

Intensive Water Quality Monitoring (Special Studies)

Intensive water quality monitoring is sometimes initiated to assess problem areas, to obtain data for use in site-specific criteria modification studies, or to provide an updated database for a waterbody. In 2004, DENR developed a special water quality monitoring plan for the Missouri River reservoirs. The focus of the plan was to develop a long term monitoring strategy to determine beneficial use support. Intensive sampling of the reservoirs was performed in 2005 and 2006. Preliminary findings based on data analyses are included in the Missouri River Basin section.

Use Attainability Analysis

DENR conducts a Use Attainability Analysis (UAA) on waterbodies with the beneficial use designation (9) Fish and wildlife propagation, recreation, and stock watering waters that receive or are proposed to receive a permitted surface water discharge under the Surface

Water Discharge Permitting Program. During the UAA, physical characteristics of the stream and surrounding land use are documented, physical and chemical properties of the surface water are analyzed, and fish species presence/absence determinations are made. The waterbody reach is visited various times to include different seasons and years. Based on the information collected, the existing beneficial use designation may remain or be assigned a more appropriate fish life propagation and recreational use designation.

Recreation Use Study

During the summer months of 2008 through 2011, DENR has been assessing and will continue to assess the recreation beneficial use of waters that are only assigned the (8) Limited contact recreation waters beneficial use as required by EPA. The purpose of the study is to determine if the existing beneficial use is appropriate or if the waterbody should also be assigned the (7) Immersion recreation waters beneficial use. During the study, field personnel measure channel depth and width, stream flow, dissolved oxygen, and pH. A surface water quality sample is collected and analyzed for fecal coliform and *E. coli* bacteria. In addition, public access, land use, channel morphology, and other physical characteristics of the waterbody are documented and photographed. Area residents are interviewed and asked questions regarding stream flow and recreational use in the waterbody.

Biological Monitoring and Assessment

Biological samples are often included as part of a watershed assessment study or a special study. DENR's Water Resource Assistance Program incorporates aquatic plant/algae surveys and chlorophyll-*a* testing into lake studies. Stream studies occasionally incorporate bioassessment surveys using fish, aquatic invertebrates and periphyton as primary biological indicators of water quality.

DENR continues to develop a reference site network for perennial wadeable streams in the Northern Glaciated Plains (NGP) ecoregion of eastern South Dakota. Reference streams are considered least impacted by human activities and are generally of high quality. Field collection involves water sampling, habitat assessments, and biological surveys. Fish, macroinvertebrates, and periphyton are the primary biological indicators. Reference quality stream reaches were selected using a multi-tiered approach. The first tier used Geographic Information System based screening tools (ATtILA) that incorporate land use attributes and scoring regimes to identify streams least impacted by human activity. The second tier involved screening digital aerial photos to verify high scoring (upper 25^{th} percentile) catchments selected during the first tier process. The third tier consisted of field visits to verify land-use and habitat condition of select stream reaches using rapid habitat assessment protocols.

The fourth tier will involve a validation process to verify the candidate references sites ability to discriminate good from poor biological health. The validation effort is being conducted through a partnership with a research team from South Dakota State University. In addition, the research team will develop a "biological monitoring toolkit" to increase the states biological monitoring and assessment capacity. A few examples of deliverables in the toolkit include calibrating a RIVPACS model and designing analysis tools to facilitate metric optimization and Index of Biotic Integrity (IBI) development. Grouping references sites into classification schemes to minimize variability across the NGP ecoregion will also be part of the development process. The future reference site network will be used for a variety of water resource management applications.

DENR and GF&P are providing financial and technical support for the development of a statewide macroinvertebrate and stream fish reference collection and database. Development and maintenance of the collection and database is being conducted by research personnel from the Natural Resource Management Department at South Dakota State University. Macroinvertebrate and fish voucher specimens from statewide collection efforts are being processed and stored at various campus facilities. All information associated with each individual specimen including geo location is being documented in the SPECIFY database (National Science Foundation). Current efforts are directed toward processing all back-logged specimens from past biological monitoring efforts. The long term goal of the project is to make the information available on line to a variety of users.

Headwater-Intermittent Streams

A large majority of the stream miles (90%) in South Dakota are characterized as intermittent. These streams were once thought to be less significant than perennial streams due to the lack of constant flow. Intermittent streams have gained recognition nationwide with respect to their ecological importance as many contribute greatly to downstream water quality, habitat condition, and biotic integrity.

DENR was awarded an EPA R-EMAP research grant (2006-2010) to develop a reference site network for intermittent headwater streams in the northern Glaciated Plains ecoregion of eastern South Dakota. The intermittent stream reference site project was conducted through a collaborative effort between DENR and the principal investigator Dr. Nels H. Troelstrup, Jr. from the Natural Resource Management Department at South Dakota State University. The project provided the state with the tools necessary to identify "reference quality" stream reaches, and the framework for developing bioassessment tools required to make determinations about habitat and biotic integrity of potentially impacted streams. Aquatic macroinvertebrates (bugs) represented the primary biological indicator for determining health of these systems. The project provided a habitat and macroinvertebrate sampling protocol and further insight into macroinvertebrate community characteristics (index period) of intermittent streams. Final deliverables associated with the intermittent stream reference site project included a detailed project summary, two M.S. theses, and several peer-viewed publications. All documents can be obtained by contacting Dr. Nels H. Troelstrup, Jr. at (605) 688-5503 or Nels.Troelstrup@sdstate.edu.

Information gained from the intermittent streams project is being used in the reference network development process for perennial streams within the Northern Glaciated Plains ecoregion of Eastern South Dakota.

Lake Survey Design

DENR uses a Generalized Random Tessellation Stratified lake survey design. This sampling design allows DENR to select a subset of the most important water resources in the state, while the random component provides statistically valid results to make general determinations about the entire target population. The target population for the 2010-2011 survey included all lakes designated coldwater and warmwater fish life beneficial uses (572). A small number (n=3) of waterbodies deemed publicly important were also sampled. Approximately 80 classified lakes were randomly selected and sampled during the 2010-2011 field season. Additional information pertaining to the probabilistic sampling design and results from the 2010-2011 survey is documented in the Statewide Surface Water Quality Summary section of the 2012 Integrated Report.

Toxicity Testing Program

Priority toxic pollutants are expensive to analyze and are not routinely monitored except for special situations. Whole effluent toxicity tests are included as permit limits in some municipal and industrial Surface Water Discharge permits.

Parameters (mg/L) except where noted	(1) Domestic water supply	(2) Coldwater permanent fish life propagation	(3) Coldwater marginal fish life propagation	(4) Warmwater permanent fish life propagation	(5) Warmwater semipermanent fish life propagation	(6) Warmwater marginal fish life propagation	(7) Immersion recreation	(8) Limited-contact recreation	(9) Fish, wildlife, propagation, recreation & stock watering	(10) Irrigation	(11) Commerce and industry
Alkalinity ($CaCO_3$)									750[1]/1,313[2]		
Barium	1.0										
Chloride	250[1]/438[2]	100[1]/175[2]									
Coliform, total (per 100 mL)	5,000 (mean): 20,000 (single Sample)										
Coliform, fecal[4] (per 100mL)							200 (mean); 400 (single sample)	1,000 (mean) 2,000 (single sample)			
Escherichia coli[4] (per 100mL)							126 (mean); 235 (single sample)	630 (mean); 1,178 (single sample)			
Conductivity (umhos/cm @ 25ºC)									4,000[1]/ 7,000[2]	2,500[1]/ 4,375[2]	
Fluoride	4.0										
Hydrogen sulfide undisassociated		0.002	0.002	0.002	0.002	0.002					
Nitrogen, total ammonia as N		[5]Equation-based limit[1,2]	[5]Equation-based limit[1,2]	[5]Equation-based limit[1,2]	[5]Equation-based limit[1,2]	[5]Equation-based limit[1,2]					
Nitrogen, nitrates as N	10.0								50[1]/88[2]		
Oxygen, dissolved[3]		≥6.0; ≥7.0 (during spawning season)	≥5.0	≥5.0; ≥6.0 (in Big Stone Lk & Lk Traverse during Apr and May)	≥5.0	≥4.0 Oct-Apr; ≥5.0 May-Sep	≥5.0	≥5.0			
pH (standard units)	6.5-9.0	6.5 - 9.0	6.5 - 9.0	6.5 - 9.0	6.5 - 9.0	6.0 - 9.0			6.0 - 9.5		6.0 - 9.5
Sodium Adsorption Ratio										10	
Solids, suspended		30[1]/53[2]	90[1]/158[2]	90[1]/158[2]	90[1]/158[2]	150[1]/263[2]					
Solids, total dissolved	1,000[1]/1,750[2]								2,500[1]/ 4,375[2]		2,000[1]/ 3,500[2]
Sulfate	500[1]/875[2]										
Temperature (ºF)		65	75	80	90	90					
Total Petroleum Hydrocarbons	≤1.0								≤10		
Oil and Grease									≤10		

Table 2: Numeric Criteria Assigned to Beneficial Uses of Surface Waters of the State ARSD 74:51:01

[1] 30-day average as defined in ARSD 74:51:01:01(60) [2] daily maximum [3]DO as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion of a stratified waterbody
[4] May 1 through September 30 [5] See Table 4

Table 3: Surface Water Quality Standards for Toxic Pollutants

Pollutant	Human Health Value Concentration in ug/L		Freshwater Aquatic Life Value Concentrations in ug/L Uses 2-3-4-5-6-9		Pollutant	Human Health Value Concentrations in ug/L		Freshwater Aquatic Life Value Concentrations in ug/L Uses 2-3-4-5-6-9	
	Use 1[3]	Uses 2-3-4-5-6-9[4]	Acute (CMC)	Chronic (CCC)		Use 1[3]	Uses 2-3-4-5-6-9[4]	Acute (CMC)	Chronic (CCC)
Acenaphthene	670	990			2,4-Dimethylphenol	380	850		
Acenaphthylene (PAH)[6]					Dimethyl Phthalate	270,000	1,100,000		
Acrolein	190	290			Di-n-Butyl-Phthalate	2,000	4,500		
Acrylonitrile[5]	0.051	0.25			2-Methyl-4,6-Dinitrophenol	13	280		
Aldrin[5]	0.000049	0.000050	1.5		2,4-Dinitrophenol	69	5,300		
Anthracene (PAH) [6]	8,300	40,000			Dioxin (2,3,7,8- TCDD) [5]	5.0E-9	5.1E-9		
Antimony	5.6	640			2,4-Dinitrotoluene[5]	0.11	3.4		
Arsenic [5]	0.018[5][13]	0.14[5][13]	340	150	1,2-Diphenylhydrazine[5]	0.036	0.020		
Asbestos[5]	7,000,000 fibers/L				alpha-Endosulfan	62	89	0.22	0.056
alpha-BHC[5]	0.0026	0.0049			beta-Endosulfan	62	89	0.22	0.056
beta-BHC[5]	0.0091	0.017			Endosulfan Sulfate	62	89		
gamma-BHC (Lindane) [5]	0.98	1.8	0.95		Endrin	0.059	0.060	0.086	0.036
Benzene[5]	2.2	51			Endrin Aldehyde	0.29	0.30		
Benzidine[5]	0.000086	0.00020			Ethylbenzene	530	2,100		
Benzo(a)Anthracene[5]	0.0038	0.018			Fluoranthene	130	140		
Benzo(a)Pyrene[5]	0.0038	0.018			Fluorene[6]	1,100	5,300		
Benzo(b) Fluoroanthene[5]	0.0038	0.018			Heptachlor[5]	0.000079	0.00079	0.52	0.0038
Benzo(k) Fluoroanthene[5]	0.0038	0.018			Heptachlor epoxide[5]	0.000039	0.000039	0.52	0.0038
Beryllium[5]	4				Hexachlorobenzene[5]	0.00028	0.00029		
Bis(2-Chloroethyl) Ether[5]	0.030	0.53			Hexachlorobutadiene [5]	0.44	18		
Bis(2-Chloroisopropyl) Ether	1,400	65,000			Hexachlorocyclo-pentadiene	40	1,100		
Bis(2-Ethylhexyl) Phthalate[5]	1.2	2.2			Hexachloroethane[5]	1.4	3.3		
Bromoform[6]	4.3	140			Ideno(1,2,3-cd) Pyrene	0.0038	0.018		
Butylbenzyl Phthalate	1,500	1,900			Isophorone[5]	35	960		
Cadmium			2.0[9]	0.25[9]	Lead			65[9]	2.5[9]
Carbon Tetrachloride[5]	0.23	1.6			Mercury	0.050	0.051	1.4	0.77[10]
Chlordane[5]	0.00080	0.00081	2.4	0.0043	Methyl Bromide	47	1,500		
Chlorine			19	11	Methyl Chloride[6]				
Chlorobenzene	130	1,600			Methylene Chloride[5]	4.6	590		
Chlorodibromomethane [5]	0.40	13			N-Nitrosodimethylamine[5]	0.00069	3.0		
Chloroform[5]	5.7	470			N-Nitrosodi-n-Propylamine[5]	0.0050	0.51		
2-Chloronaphthalene	1,000	1,600			N-Nitrosodi-phenylamine[5]	3.3	6.0		
2-Chlorophenol	81	150			Nickel	610	4,600	470[9]	52[9]
Chromium(III)			570[9]	74[9]	Nitrobenzene	17	690		
Chromium(VI)			16	11	Polychlorinated Biphenyls, PCBs[2][5][7][11]	0.000064	0.000064		0.14

Pollutant	Human Health Value Concentration in ug/L		Freshwater Aquatic Life Value Concentrations in ug/L Uses 2-3-4-5-6-9		Pollutant	Human Health Value Concentrations in ug/L		Freshwater Aquatic Life Value Concentrations in ug/L Uses 2-3-4-5-6-9	
	Use 1[3]	Uses 2-3-4-5-6-9[4]	Acute (CMC)	Chronic (CCC)		Use 1[3]	Uses 2-3-4-5-6-9[4]	Acute (CMC)	Chronic (CCC)
Chrysene[5]	0.0038	0.018			Pentachlorophenol	0.27	3.0	19[8]	15[8]
Copper	1,300		13[9]	9.0[9]	Phenanthrene[6]				
Cyanide (weak acid dissociable)	140	140	22	5.2	Phenol	21,000	1,700,000		
4,4'-DDD[5]	0.00031	0.00031			Pyrene[6]	830	4,000		
4,4'-DDE[5]	0.00022	0.00022			Selenium[7]	170	4,200	[12]	4.6
4,4'-DDT[5][7]	0.00022	0.00022	1.1	0.001	Silver			3.2[9]	
Dibenzo(a,h)Anthracene[5]	0.0038	0.018			1,2,4-Trichlorbenzene	35	70		
1,2-Dichlorobenzene	420	1,300			1,1,2,2-Tetrachloroethane[5]	0.17	4.0		
1,3-Dichlorobenzene	320	960			Tetrachloroethylene[6]	0.69	3.3		
1,4-Dichlorobenzene	63	190			Thallium	0.24	0.47		
3,3- Dichlorobenzidine[5]	0.021	0.028			Toluene	1,300	15,000		
Dichlorobromomethane [6]	0.55	17			Toxaphene[5]	0.00028	0.00028	0.73	0.0002
1,2-Dichloroethane[5]	0.38	37			1,2-Trans-Dichloroethylene	140	10,000		
1,1-Dichloroethylene[5]	330	7,100			1,1,1-Trichloroethane				
2,4-Dichlorophenol	77	290			1,1,2-Trichloroethane[5]	0.59	16		
1,2-Dichloropropane[5]	0.50	15			Trichloroethylene[5]	2.5	30		
1,3-Dichloropropene	0.34	21			2,4,6-Trichlorophenol[5]	1.4	2.4		
Dieldrin[5]	0.000052	0.000054	0.24	0.056	Vinyl Chloride[5]	0.025	2.4		
Diethyl Phthalate	17,000	44,000			Zinc	7,400	26,000	120[9]	120[9]

(1) The aquatic life values for arsenic, cadmium, chromium (III), chromium (VI), copper, lead, mercury (acute), nickel, selenium, silver, and zinc given in this document refer to the dissolved amount of each substance unless otherwise noted. All Surface Water Discharge permit effluent limits for metals shall be expressed and measured in accordance with § 74:52:03:16.

(2) Apply to the beneficial uses as designated but do not supersede those standards for certain toxic pollutants as previously established in §§ 74:51:01:31, 74:51:01:32, 74:51:01:44 to 74:51:01:54, inclusive, and § 74:51:01:56.

(3) Based on two routes of exposure – ingestion of contaminated aquatic organisms and drinking water.

(4) Based on one route of exposure – ingestion of contaminated aquatic organisms only.

(5) Substance classified as a carcinogen with the value based on an incremental risk of one additional instance of cancer in one million persons (10^{-6}).

(6) Chemicals which are not individually classified as carcinogens but which are contained within a class of chemicals with the carcinogenicity as the basis for the criteria derivation for that class of chemicals; an individual carcinogenicity assessment for these chemicals is pending.

(7) Also applies to all waters of the state.

(8) pH-dependent criteria. Value given is an example only and is based on a pH of 7.8. Criteria for each case must be calculated using the following equation taken from National Recommended Water Quality Criteria: 2002 (EPA-822-R-02_047, November 2002);

Pentachlorophenol (PCP), ug/L

Chronic = $e^{[1.005(pH) - 5.134]}$

Acute = $e^{[1.005(pH) - 4.869]}$

(9) Hardness-dependent criteria in ug/L. Value given is an example only and is based on a $CaCO_3$ hardness of 100 mg/L. Criteria for each case must be calculated using the following equations taken from National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047, November 2002):

Cadmium ug/L

Chronic = $(*0.909)_e(0.7409[\ln(\text{hardness})]-4.719)$

Acute = $(*0.944)_e(1.0166[\ln(\text{hardness})]-3.924)$

*Conversion factors are hardness-dependent. The values shown are with a hardness of 100 mg/L as calcium carbonate ($CaCO_3$). Conversion factors (CF) for any hardness can be calculated using the following equations:

Chronic: CF = 1.101672 – [(ln hardness)(0.041838)]

Acute: CF = 1.136672 – [(ln hardness)(0.041838)]

Chromium (III), ug/L

Chronic = $(0.860)_e(0.8190[\ln(\text{hardness})]+0.6848)$

Acute = $(0.316)_e(0.8190[\ln(\text{hardness})]+3.7256)$

Copper, ug/L

Chronic = $(0.960)_e(0.8545[\ln(\text{hardness})]-1.702)$

Acute = $(0.960)_e(0.9422[\ln(\text{hardness})]-1.700)$

Lead, ug/L

Chronic = $(*0.791)_e(1.273[\ln(\text{hardness})]-4.705)$

Acute = $(*0.791)_e(1.273[\ln(\text{hardness})]-1.460)$

*Conversion factors are hardness-dependent. The values shown are with a hardness of 100 mg/L as calcium carbonate ($CaCO_3$). Conversion factors (CF) for any hardness can be calculated using the following equations:

Acute and Chronic: CF = 1.46203 – [(ln hardness)(0.145712)]

Nickel, ug/L

Chronic = $(0.997)_e(0.8460[\ln(\text{hardness})]+0.0584)$

Acute = $(0.998)_e(0.8460[\ln(\text{hardness})]+2.255)$

Silver, ug/L
Acute = $(0.85)_e(1.72[\ln(\text{hardness})]-6.59)$

Zinc, ug/L
Chronic = $(0.986)_e(0.8473[\ln(\text{hardness})]+0.844)$

Acute = $(0.978)_e(0.8473[\ln(\text{hardness})]+0.844)$

(10) These criteria are based on the total recoverable fraction of the metal.

(11) This criterion applies to total pcbs (e.g. the sum of congener or all isomer or homolog or Aroclor analyses).

(12) The (0.996)CMC = 1/[fl/CMC1) + (f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 Φg/L and 12.82 Φg/L, respectively.

(13) This criterion for arsenic refers to the inorganic form only.

Table 4: South Dakota Surface Water Quality Standards for Total Ammonia as N

Equation 1: For Waters where salmonid fish are present.
$(0.275/(1+10^{7.204-pH})) + (39.0/(1+10^{pH-7.204}))$
Equation 2: For Waters where salmonid fish are not present.
$(0.411/(1+10^{7.204-pH})) + (58.4/(1+10^{pH-7.204}))$
Equation 3: For waters where early life stages are present
$(((0.0577/(1+10^{7.688-pH})) + (2.487/(1+10^{pH-7.688}))) * MIN(2.85, 1.45 * 10^{0.028 * (25-T)}))$
Equation 4: For waters where early life stages are absent.
$(((0.0577/(1 + 10^{7.688-pH})) + (2.487/(1 + 10^{pH-7.688}))) * 1.45 * 10^{0.028 * (25-MAX(T,7))})$
T = *the water temperature of the sample in degrees Centigrade* pH - *the pH of the water quality sample in standard units* MIN = *use either 2.85 or the value of* $1.45^{0.028 * (25-T)}$*, whichever is the smaller value* MAX = *use either the water temperature (T) for the sample or 7, whichever is the greater value*

Total Maximum Daily Loads (TMDLs) and Section 303(d)

Overview of TMDLs

TMDLs are an important tool for the management and protection of South Dakota's surface water quality. The goal of TMDLs is to ensure that waters of the state attain and maintain water quality standards that support their designated beneficial uses. EPA defines a TMDL as "the sum of the individual waste load allocations for point sources and load allocations for both nonpoint sources and natural background sources established at a level necessary to achieve compliance with applicable surface water quality standards." In simple terms, a TMDL is the amount of pollution a waterbody can receive and still support its designated beneficial uses. TMDLs must be developed for impaired waters, should address a specific waterbody or watershed, and should specify quantifiable targets and associated actions that will enable a given waterbody to support its designated beneficial uses.

Section 303(d) of the federal Clean Water Act requires states to develop and submit for approval a list of waters targeted for TMDL development every two years. This is referred to as the 303(d) list. Items that must accompany this list include targeted pollutants and time frames for TMDL development.

Once identification of TMDL waters are completed, states are to develop TMDLs at a pace necessary to complete all the TMDLs during a 13-year period. TMDLs must allow for seasonal variations and a margin of safety that accounts for any lack of knowledge concerning the relationship between pollutant loadings and water quality. Appendix A provides a list of waterbodies with EPA approved TMDLs.

Types of Waters Listed

The following information and data sources were used to determine which waterbodies require TMDLs based on the requirements of section 303(d) of the federal Clean Water Act:

- Waters included in the Integrated Report that are identified as "not supporting" or also known as "impaired" waters;
- Waters for which modeling indicates nonattainment of water quality standards; and
- Waters for which documented water quality problems have been reported by local, state, or federal agencies; the general public; or academic institutions.

Appendix D provides a summary of DENR's 2012 303(d) list.

Impaired Waters

Waters that are considered impaired require a TMDL. This includes waters that are identified under the "not supporting" beneficial use categories in this report unless the waterbody has a TMDL approved by EPA that addresses the impairments.

Waters with Surface Water Discharge-Related Wasteload Allocations

In 1993, DENR was delegated the authority to administer the National Pollutant Discharge Elimination System (NPDES) permitting program. As stated earlier, South Dakota's NPDES permitting program is referred to as the Surface Water Discharge (SWD) permitting program. SWD permits are used to control the discharge of pollutants from point sources. At a minimum, most SWD permits contain technology-based effluent limits which are attained using the best available technology that is economically achievable. However, in some cases the application of technology-based effluent limits is not sufficient to ensure the surface water quality standards are maintained. For these permits, DENR develops water quality-based effluent limits for the permit.

If a SWD permittee discharges a pollutant to an impaired waterbody, the TMDL for that pollutant will include a "wasteload allocation" for the permittee. The wasteload allocation is implemented through the SWD permit.

SWD permits are issued for a maximum of five years, after which time the effluent limits and existing in-stream water quality are reevaluated. Ammonia, biochemical oxygen demand (BOD), and dissolved oxygen are the primary parameters targeted for modeling to develop water quality-based effluent limits. Very few streams have impairments for ammonia or dissolved oxygen; therefore, South Dakota's point source control program has been effective at maintaining and improving the quality of surface waters in the state.

Waters Reported by Government Agencies, Members of the General Public, or Academic Institutions
DENR did not receive any recommendations to list specific water resources on the 303(d) list by any other government agencies, members of the general public, environmental organizations, or academic institutions for the 2012 Integrated Report.

Prioritization of TMDL Waters

Regulatory Requirements
Section 303 (d) of the federal Clean Water Act requires that *"each state shall establish a priority ranking for such waters, taking into account the severity of the pollution and the uses to be made of such waters."* Little other guidance is offered for states to use in the prioritization process.

A system of prioritization has been developed by DENR based on several factors. Included in these factors are the required elements of *"the severity of the pollution and the uses to be made of such waters."* The highest priorities are given to impaired waters meeting the following criteria (Priority 1):

- Imminent human health problems;
- Waters where TMDL development is expected during the next two years;
- Waters listed for four or more causes; or
- Waters with documented widespread local support for water quality improvement.

Priority 2 waters meet the following criteria:

- Waters listed for three or less causes;
- Waters where local support for TMDL development is expected but not documented;
- Waters with no evident local support for water quality improvements; or
- Waters where impairments are believed to be due largely to natural causes.

These criteria are a guide. If a waterbody met any single criteria in a category, it does not necessarily mean the waterbody was prioritized as such.

Section 319 Related Waters
Section 319 TMDL assessments are developed based upon the prioritization criteria listed above. Section 319 TMDLs are developed as part of an assessment project. DENR prefers to develop TMDLs in 12 digit hydrologic units or larger "clusters" that include all nonpoint source TMDLs required for a river basin. For larger basins, such as the Big Sioux River basin, studies are completed by dividing the basin into sub-basins.

Watershed implementation projects for completed nonpoint source TMDL assessments also follow the "clustering" format within associated river basins or sub-basins. Implementation projects for completed TMDL assessments hinge upon whether adequate local support exists. For more information on nonpoint source TMDL development and implementation refer to the "South Dakota Nonpoint Source Program Management Plan." This document is located at the following web link:

http://denr.sd.gov/dfta/wp/NPSMgmtPlan07.pdf

Surface Water Discharge Related Waters
The priorities for developing water quality-based effluent limits are not based upon the severity of waterbody impairment but upon the importance of maintaining water quality improvements made through the permits. DENR issues Surface Water Discharge permits on a 5-year basis.

Summary of the State TMDL Waterbodies

Using the methodologies, data, information, and public input described for the surface water quality assessments, DENR included the waterbodies that require TMDLs (previously known as the 303(d) list) in Tables 24 – 37. These tables include waterbody names, pollutants of concern, basis for listing, and other information. A total of 155 different waterbodies require TMDLs (Table 6). Each waterbody may contain several different pollutants and thereby may constitute several TMDLs. In addition, some streams are listed more than once due to TMDLs identified for different segments of the same stream (even for the same pollutant).

If a specific waterbody required a TMDL for several different pollutants, all pollutants were grouped into one watershed assessment for that waterbody. In reality, it may not be possible to incorporate each pollutant into a single study for each waterbody segment, but this assumption was made for planning purposes. There may be other cases where widespread support for water quality improvements, large single entity landholders (federal lands, state lands, etc.), or other factors allow several waterbodies to be targeted for improvement under a single study. Possible scenarios such as these make TMDL numbers difficult to project. Notwithstanding this fact, the implications of the list are that a monumental work effort is required to complete the number of TMDLs in the time frame suggested by the list.

Resource Implications
TMDL issues span a wide range of activities within DENR. Nonpoint source assessments, clean lakes assessments, discharge permitting, storm water discharge permitting, erosion control, water quality monitoring, water quality standards, water rights, feedlot regulations, and other areas are involved in or affect TMDL development and implementation. Because of this, the development and implementation of TMDLs will rely on existing programs, resources, and activities. Effective TMDL development requires effective and continuous coordination within all DENR water programs. In addition, the development and implementation of effective TMDLs that will result in improving the quality of South Dakota's waters must have the support, input, and coordination of affected government agencies, local groups, and citizens. As such, the TMDL effort will involve the coordination of many diverse groups and the public with the common goal of improving water quality.

It is not possible to develop TMDLs for every waterbody within two years. The time frame to develop TMDLs on each biennial list is 13 years based on EPA guidelines.

Status of 2010 Integrated Report TMDLs

South Dakota's 2010 303(d) list contained 159 waterbodies or waterbody reaches and a total of 232 waterbody/cause combinations that require TMDL development. Sixty-nine waterbody/cause combinations have had TMDLs completed or determined to be unnecessary by DENR since April 1, 2010.

Table 5 and Figure 1 show the status of waters that required TMDLs in the 2010 Integrated Report. The following definitions further describe status categories:

- TMDLs completed – a watershed assessment has been completed, and a TMDL has been completed and approved by EPA;
- Delisted based on new information – A TMDL is no longer necessary, the cause was delisted based on information such as additional data, change in assessment method, change in water quality standard, listed in error, etc.;
- TMDLs in progress – a watershed assessment is currently underway. The results of the assessment will lead to a TMDL document, a revision of the waterbody beneficial use, a site specific water quality standard, or a determination that the cause is natural; and
- TMDLs planned – A watershed assessment has not been initiated but is planned.

Table 5: Status of TMDLs from 2010 Integrated Report

TMDL Status	Number and Percentage of TMDLs
TMDLs completed:	32 (14%)
Delisted based on new information:	37 (16%)
TMDLs in progress:	79 (34%)
TMDLs planned:	84 (36%)
Total reach/cause combinations:	232 (100%)

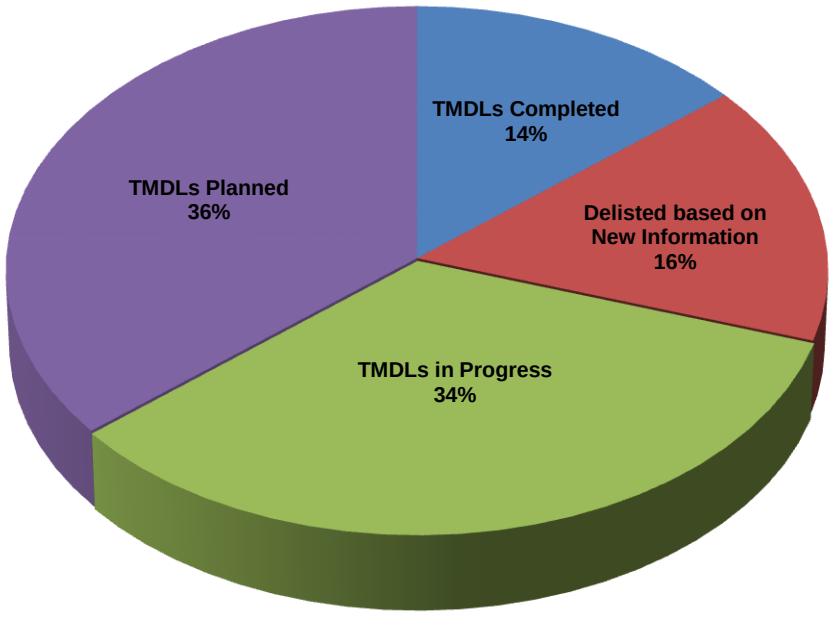


Figure 1: Status of TMDLs from the 2010 Integrated Report

Delisting of Certain 2010 TMDL Waters and Other Exclusions

Delisting of Waterbodies

Waters were delisted using the following criteria:

- EPA approved TMDL(s) in place for all pollutants of concern;
- Water quality standard (WQS) attained:
  - Due to restoration activities; or
  - Due to changes in WQS; or
    - Delistings due to WQS changes in 2012 were due to the addition of a flow rate requirement for high quality fisheries (74:51:01:29) and low quality fisheries and irrigation waters (74:51:01:30).
  - According to new assessment method; or
  - Original basis for listing was incorrect; or
  - Threatened water no longer threatened; or
    - This delisting reason means the waterbody meets water quality standards, however was previously listed as threatened. The threatened flag may be used when waterbody support is borderline, trends toward nonsupport, or a decision based on best professional judgment.
  - Reason for recovery unspecified
    - This delisting reason means the waterbody meets water quality standards but the reason for the recovery is unclear. Recovery may be due to a variety of reasons including a greater quantity of water samples collected, changes in the hydrologic cycle, and others.
- Flaws in original listing;
- Additional state effluent controls address water quality problems;
- Reservoir has been breached and is no longer a viable waterbody; or
- Data and/or information lacking to determine water quality status; original basis for listing was incorrect.

Appendix B is a list of impairment causes and associated waterbodies that have been delisted in 2012.

TMDLs Required by the 2012 Integrated Report

Table 6 is a list of the projected number of TMDLs required in each basin and the associated pollutants of concern. Watershed assessments are currently underway in several basins. Several of these assessment efforts have identified additional impaired reaches that were not previously recognized in the 2010 Integrated Report. The total number of TMDLs has decreased from 2010 to 2012. Many of these impaired watersheds have TMDL development and/or implementation projects already in progress.

Table 6: 2012 Summary of TMDLs by Basin

Basin	Number of Waterbodies Requiring TMDLs	Pollutants of Concern
Bad River Basin	3	dissolved oxygen, specific conductance, total dissolved solids, chlorophyll-*a*
Belle Fourche River Basin	14	water temperature, *E. coli*, pH, total suspended solids, mercury in fish tissue
Big Sioux River Basin	23	water temperature, fecal coliform, *E. coli*, pH, total suspended solids, mercury in fish tissue, dissolved oxygen, chlorophyll-*a*
Cheyenne River Basin	29	water temperature, alkalinity, sodium adsorption ratio (salinity), total dissolved solids, fecal coliform, pH, specific conductance, *E. coli*, total suspended solids, dissolved oxygen
Grand River Basin	11	water temperature, sodium adsorption ratio (salinity), fecal coliform, *E. coli*, specific conductance, total suspended solids, mercury in fish tissue, chlorophyll-*a*
James River Basin	37	*E. coli*, pH, total suspended solids, dissolved oxygen, chlorophyll-*a*, water temperature
Little Missouri River Basin	1	total suspended solids
Minnesota River Basin	9	dissolved oxygen, pH, *E. coli*, water temperature
Missouri River Basin	11	dissolved oxygen, pH, water temperature, mercury in fish tissue, chlorophyll-*a*
Moreau River Basin	5	fecal coliform, *E. coli*, total suspended solids, total dissolved solids, sodium adsorption ratio (salinity), specific conductance, mercury in fish tissue, pH
Niobrara River Basin	1	chlorophyll-*a*
Red River Basin		
Vermillion River Basin	6	fecal coliform, *E. coli*, pH, chlorophyll-*a*, dissolved oxygen
White River Basin	5	fecal coliform, *E. coli*, sodium adsorption ratio (salinity)
TOTALS	155	

METHODOLOGY

Two major types of assessments were used to determine use support status of waterbodies: one based on monitoring, and the other based on qualitative evaluations. Monitoring data were primarily obtained from DENR, USGS, USACE, BOR, and the cities of Huron, Watertown, and Sioux Falls. In addition, the United States Army Corps of Engineer 2009 Report on Missouri River water quality was used in making support determinations. Sources of quantitative and qualitative lake assessment data were acquired from the Statewide Lakes Assessment project and individual assessment studies.

DENR maintains a Quality Assurance/Quality Control (QA/QC) Program to ensure that all environmental water quality data generated or processed meet standard accepted requirements for precision, accuracy, completeness, representativeness, and comparability. This entails the preparation and periodic review and revision of the DENR Quality Assurance Program and individual project plans. It also includes the preparation of periodic reports to DENR management and EPA; the review of contracts, grants, agreements, etc., for consistency with QA/QC requirements; and the administration of QA/QC systems and performance audits. The latter activity requires the establishment of schedules for the collection of duplicate and blank samples, periodic testing of field sampling techniques, and liaison with contracted labs to ensure compliance with QA/QC objectives. DENR maintains an EPA approved Quality Management Plan (Revision IV, October 2011). The Surface Water Quality Program operates under the *Quality Assurance Project Plan for the Surface Water Discharge Permitting Team, Feedlot Permitting Team, and Water Quality Monitoring and Standards Team*, Revision IV, September 2010. The Water Resources Assistance Program operates under the *Water Resources Assistance Program Quality Assurance Project Plan for the Assessment Team and Implementation Team,* Revision III, March 2011. Both programs operate under defined procedures in *Standard Operating Procedures for Field Samplers,* Volume I & II, February 2005.

The ambient water quality monitoring (WQM) network provides useful information on overall stream water quality. Only a brief summary of water quality is included because of the large volume of data and reports. A more detailed description of the stream ambient monitoring program is found in the preceding Surface Water Quality Monitoring Program chapter of this document.

Fixed station monitoring data were assessed by dividing major streams into segments that contain the same designated beneficial uses, water quality standards criteria, and environmental and physical influences. When section, township, and range are used in ARSD Chapter 74:51:03 to describe the beginning or end point of a stream segment, the boundary of the segment is that point where the most downstream portion of the stream crosses the boundary of that section. Data obtained during the current reporting period were analyzed by using DENR's NR92 Database system. The data for each monitored segment were compared to state water quality standards applicable to the beneficial uses assigned to the segment in question (Tables 2 and 3). Monitored stream course mileages and lake acreages were measured using the Hydrography Event Management Tool.

Specific criteria were developed to define how data for streams would be evaluated to determine the status of each stream segment (waterbody). The following criteria were used:

Table 7: Sample Criteria for Determining Support Status

Description	Criteria Used
FOR CONVENTIONAL PARAMETERS (such as dissolved oxygen, total suspended solids, pH, water temperature, fecal coliform bacteria, *E. coli* bacteria, etc.) Number of observations (samples) required to consider data representative of actual conditions	STREAMS: at least 20 samples for any one parameter are required within a waterbody reach. The sample threshold is reduced to 10 samples if 3 or more samples exceed daily maximum water quality standards. A minimum of two 30-day average results is used for 30-day average criteria. LAKES: at least two independent years of sample data and at least two sampling events per year.
FOR CONVENTIONAL PARAMETERS Required percentage of samples exceeding water quality standards to consider segment water quality-limited	STREAMS: >10% (Or 3 or more exceedances between 10 and 19 samples) for daily maximum criteria. >10% (or 2 or more exceedances between 2 and 19 samples) for 30-day average criteria. LAKES: >10% exceedances when 20 or more samples were available. If < 20 samples were available, 3 exceedances were considered impaired. See lakes listing methodology section for specifics on parameters associated with a vertical profile (i.e., dissolved oxygen, water temperature, pH, and specific conductance).
FOR TOXIC PARAMETERS (such as metals, mercury, total ammonia, etc.) Number of observations (samples) required	STREAMS: At least one water quality sampling event. LAKES: At least one fish flesh sampling event. More than one exceedance of toxic criteria within the past 3 years.
FOR TOXIC PARAMETERS Required percentage of samples exceeding water quality standards in order to consider segment water quality-limited	STREAMS: More than one exceedance of toxic criteria within the past 3 years for both the acute and chronic standard. LAKES: If fish flesh samples are above the Federal Drug Administration's recommended action levels (such as 1 part per million for mercury).
Data age (for both conventional and toxic parameters)	STREAMS: Data collected from October 1, 2006, to September 30, 2011 LAKES: All available data from the most recent 10 year period, January 2001 through September 2011. Unless there is justification that data are (or are not) representative of current conditions. While data age of two years matches the report cycle, it does not allow for enough samples to accurately portray variability.
Quality Assurance/Quality Control (for both conventional and toxic parameters)	STREAMS and LAKES: There must be a consensus that the data meet QA/QC requirements similar to those outlined in DENR protocols. QA/QC data were encouraged to be submitted. Internal and external data will only be used if proper QA/QC protocols, sampling methods, and EPA approved analytical methods were used.

Deviations from the above criteria were allowed in specific cases and are generally discussed in the proceeding tables listing the surface water quality summaries. Use support assessment for all assigned uses was based on the number of exceedances of water quality standards for the following parameters: total suspended solids, total dissolved solids, pH, water temperature, dissolved oxygen, fecal coliform, *E. coli*, and others. Exceedances of more than one parameter were not considered additive in determining overall support status for any given waterbody. A stream segment with less than 10% exceedances with respect to the total number of samples for one or more parameters is considered fully supporting. However, toxic parameters including those in Table 3 are only allowed one violation in a three-year period. Chronic standards, including geometric means and 30-day averages, are applied to a calendar month. For hardness-based metals, the hardness and metal concentrations were averaged for the calendar month. Complete listings of relevant parameters appear in Tables 2 and 3.

To ensure a sufficient number of samples were available for each stream segment (usually a minimum of 20) the period of record considered for this report was from October 1, 2006, to September 30, 2011, (5 years) for streams, and January 1, 2001, to September 30, 2011, (10 years) for lakes. The ten-year timeframe in lakes was designated to account for climatic variability (wet and dry cycles) and increase the chance of covering multiple sampling events. The ten-year time frame was thought to provide a more recent description of a lake's support status between reporting cycles in comparison to using all available data.

Waterbody support determinations are heavily influenced by the numbers of samples obtained based on the criteria in Table 7. DENR acknowledges that differences in the number of samples obtained for a waterbody reach between reporting cycles may influence the support determination and EPA reporting category. As a protective measure, DENR may designate a reach as "threatened waters." A "threatened water" designation may be assigned if the reach demonstrates: a declining trend that may result in water quality standard exceedances by the next reporting cycle, the reach has previously been listed as nonsupporting and the current number of samples obtained change the determination to full support but with a high percent of exceedances, or, there are proposed activities in the waterbody reach that may cause exceedances. A "threatened waters" designation may also be used when water quality monitoring does not indicate impairment of WQS; however, the waterbody is considered impaired for other reasons, including waterbodies with fish consumption advisories. Regardless of support determination, waterbodies designated as "threatened waters" are automatically placed in category 5 and are placed on the 303(d) list. Much of the waterbody impairment information is summarized in Tables 9 through 23. More detailed information on the lakes and streams in each river basin is presented in Tables 24 through 37.

In addition to use support assessment above, South Dakota has chosen to use the assessment categories that EPA recommends in its guidance that was issued in July 2005. South Dakota's assessment categories are as follows:

Category 1: All designated uses are met;
Category 2: Some of the designated uses are met but there is insufficient data to determine if remaining designated uses are met;
Category 3: Insufficient data to determine whether any designated uses are met;
Category 4A: Water is impaired but has an EPA approved TMDL;
Category 4B: Water is impaired but implementation project (best management practices) is in place;
Category 4C: Water is impaired by a parameter that is not considered a "pollutant;" and
Category 5: Water is impaired or threatened and a TMDL is needed.

Support assessment for fish and aquatic life propagation use primarily involves monitoring the following major parameters: dissolved oxygen, total ammonia, water temperature, pH, alkalinity, and total suspended solids.

Support assessment for immersion recreation and limited contact recreation involves monitoring dissolved oxygen, *E. coli*, and fecal coliform. Fecal coliform and *E. coli* are monitored from May 1 through September 30 of each year (Table 2).

Support assessment for domestic water supply uses involves monitoring total dissolved solids, nitrates, pH, chlorides, and sulfates.

South Dakota adopted numeric surface water quality criteria with the 1967 "Water Quality Standards for the Surface Waters for the State of South Dakota." The main intent of numeric water quality criteria is to protect designated beneficial uses. Numeric criteria are needed to develop numeric effluent limits for facilities that discharge wastes to surface water. However, since South Dakota has numeric water quality criteria, a strict interpretation of the water quality standards could imply that a waterbody could potentially be listed as "impaired" or "nonsupporting" even if only one exceedance occurred within a five-year period. South Dakota and even EPA have traditionally viewed the 10% approach (as stated in the criteria for determining support status in Table 7) as an appropriate measuring tool to determine waters that require further in-depth study and TMDL development. Factors such as drought, high precipitation events, and other environmental factors can cause significant variation in water quality. One exceedance of a conventional parameter, such as pH or water temperature, does not indicate a waterbody is not supporting its beneficial use. The methodology employed by the department in the interpretation of the data for the 2012 Integrated Report is consistent with DENR's interpretation of the South Dakota Surface Water Quality Standards. Therefore, for Integrated Report purposes, DENR defines "impairment" or "nonsupport" of a beneficial use of a waterbody by the criteria found in Table 7.

Lakes 303(d) Listing Methodology

Support determinations and impairment listings were only made of those lakes considered assessed. The minimum requirements for a lake to be considered assessed include two criteria: 1) at least two independent years of sample data and; 2) at least two sampling events per year. All available data from the most recent 10 year period (2001-2011) were used to make support determinations and impairment decisions. Data older than the most recent 10 years were considered in the impairment analysis if deemed important to make support and/or impairment determinations. For example, if the violation rate for a particular water quality standard parameter was borderline (10%) older data were examined to determine if a trend exists in historic data.

The primary water quality data used to make impairment decisions were acquired from the following sources: the statewide lakes assessment project, individual lake assessment projects, outside entities, and when appropriate, citizens monitoring efforts.

Statewide Lakes Assessment (SWLA) Project
Lakes are historically sampled on a four-year rotation (i.e. about 31 lakes annually) twice during the growing season. Sampling stations consist of one to three predetermined site locations within the basin of each lake. The number of site locations assigned to each lake is dependent on basin size. Field measurements are collected at each site and water samples are composited from each site.

Individual Lake Assessment Projects
Project specific data are usually collected monthly throughout the growing season and during winter months with safe ice conditions from site locations consistent with those established during the SWLA project. Field measurements and water samples are usually collected at each site.

Data from outside entities and citizens monitoring efforts are used when sampling efforts follow similar protocol to the SWLA project or individual lake assessments.

A standard suite of water quality parameters are measured or analyzed. Water temperature, dissolved oxygen, conductivity, specific conductance, pH, and Secchi disk transparency are measured on site. Chlorophyll-*a* is extracted from 50-1000 ml of lake sample and analyzed by spectrophotometer as described by APHA (1998). The remaining nutrient, solids, and bacteria samples are preserved, iced, and shipped to the State Health Laboratory in Pierre, South Dakota, for individual parameter analysis.

DENR's lake sampling efforts are based on a Generalized Random Tessellation Stratified survey design. This sampling design allows DENR to select a subset of the most important water resources in the state, while the random component provides statistically valid results to make general determinations about the entire target population. The target population for the 2010-2011 survey included all lakes designated coldwater and warmwater fish life beneficial uses (572). A small number (n=3) of waterbodies deemed publicly important were also sampled. The number of lakes sampled annually is dependent on available resources and statistical requirements of the random sampling component. A total of 81 classified lakes were sampled during the 2010-2011 field season.

Lake survey data collected as part of the random sampling design were used to make impairment decisions if the lake was considered assessed based on the minimum requirements listed above.

DENR is currently reviewing information and exploring options for consideration of a process for addressing narrative standards associated with lake eutrophication to make holistic lake listing decisions. The department currently relies on available water quality data, public opinion, and professional judgment to make case specific listing decisions related to narrative standards, generally resulting from a formal complaint.

South Dakota has numeric water quality standards designed to protect the designated beneficial uses of lakes under Administrative Rule Article 74:51:01-Surface Water Quality Standards. Numeric water quality standards associated with lake and reservoir designated beneficial uses are used exclusively as benchmarks to make 303(d) listing decisions. The following tables describe the water quality standard parameters and associated criteria used to make beneficial use support determinations and impairment decisions. Parameters with an asterisk (*) represent conventional parameters typically collected during water quality monitoring efforts. The sample origin refers to the parameter-specific data collection method.

Table 8: Lake Listing Criteria

Criteria for domestic water supply waters:

Parameter	Criteria	Sample origin
*Total Dissolved Solids	≤ 1750 mg/L	Water sample
*Nitrates as N	≤ 10 mg/L	Water sample
*pH	≥ 6.5 to ≤ 9.0 units	Vertical Profile
Total Coliform	≤ 20,000 / 100mL	Water sample
Barium	≤ 1.0 mg/L	Water sample
Chloride	≤ 438 mg/L	Water sample
Fluoride	≤ 4.0 mg/L	Water sample
Sulfate	≤ 875 mg/L	Water sample
Total Petroleum Hydrocarbons	≤ 1.0 mg/L	Water sample

Criteria for coldwater permanent fish life propagation waters:

Parameter	Criteria	Sample origin
*Total ammonia nitrogen as N	Equal or < result from Equation 1. Table 4.	Water sample
Chlorides	≤ 175 mg/L	Water sample
*Dissolved oxygen (see below)	≥ 5.0 mg/L	Vertical Profile
Undisassociated hydrogen sulfide	≤ 0.002 mg/L	Water sample
*pH	≥ 6.5 to ≤ 9.0 units	Vertical Profile
*Total Suspended Solids	≤ 158 mg/L	Water sample
*Temperature	≤ 65 °F	Vertical Profile

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for coldwater marginal fish life propagation waters:

Parameter	Criteria	Sample origin
*Total ammonia nitrogen as N	Equal or < result from Equation 1. Table 4	Water sample
*Dissolved oxygen (see below)	≥ 5.0 mg/L	Vertical Profile
Undisassociated hydrogen sulfide	≤ 0.002 mg/L	Water sample
*pH	≥ 6.5 to ≤ 9.0 units	Vertical Profile
*Total Suspended Solids	≤ 158 mg/L	Water sample
*Temperature	≤ 75 °F	Vertical Profile

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for warmwater permanent fish life propagation waters:

Parameter	Criteria	Sample origin
*Total ammonia nitrogen as N	Equal or < result from Equation 2. Table 4	Water sample
*Dissolved oxygen (see below)	≥ 5.0 mg/L	Vertical Profile
*Dissolved oxygen (see below)	≥ 6.0 mg/L Big Stone and Traverse Lake April and May	Vertical Profile
Undisassociated hydrogen sulfide	≤ 0.002 mg/L	Water sample
*pH	≥ 6.5 to ≤ 9.0 units	Vertical Profile
*Total Suspended Solids	≤ 158 mg/L	Water sample
*Temperature	≤ 80 °F	Vertical Profile

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for warmwater semipermanent fish life propagation waters:

Parameter	Criteria	Sample origin
*Total ammonia nitrogen as N	Equal or < result from Equation 2. Table 4	Water sample
*Dissolved oxygen (see below)	≥ 5.0 mg/L	Vertical Profile
Undisassociated hydrogen sulfide	≤ 0.002 mg/L	Water sample
*pH	≥ 6.5 to ≤ 9.0 units	Vertical Profile
*Total Suspended Solids	≤ 158 mg/L	Water sample
*Temperature	≤ 90 °F	Vertical Profile

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for warmwater marginal fish life propagation waters:

Parameter	Criteria	Sample origin
*Total ammonia nitrogen as N	Equal or < result from Equation 2. Table 4	Water sample
*Dissolved oxygen (see below)	≥ 4.0 mg/L Oct.1 - Apr. 30	Vertical Profile
*Dissolved oxygen (see below)	≥ 5.0 mg/L May 1 – Sept. 30	Vertical Profile
Undisassociated hydrogen sulfide	≤ 0.002 mg/L	Water sample
*pH	≥ 6.5 to ≤ 9.0 units	Vertical Profile
*Total Suspended Solids	≤ 263 mg/L	Water sample
*Temperature	≤ 90 °F	Vertical Profile

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for immersion recreation waters:

Parameter	Criteria	Sample origin
*Dissolved oxygen (see below)	≥ 5.0 mg/L	Vertical Profile
*Fecal coliform- May 1st to Sept. 30	≤ 400 / 100mL	Water sample
**Escherichia coli* - May 1st to Sept. 30	≤ 235 / 100mL	Water sample

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for limited contact recreation waters:

Parameter	Criteria	Sample origin
*Dissolved oxygen (see below)	≥ 5.0 mg/L	Vertical Profile
*Fecal coliform- May 1st to Sept. 30	≤ 2,000 / 100mL	Water sample
**Escherichia coli* - May 1st to Sept. 30	≤ 1178 / 100mL	Water sample

Dissolved oxygen: as measured anywhere in the water column of a non-stratified waterbody, or in the epilimnion and metalimnion of a stratified waterbody.

Criteria for fish and wildlife propagation, recreation, and stock watering waters:

Parameter	Criteria	Sample origin
*Total Alkalinity as calcium carbonate	≤ 1,313 mg/L	Water sample
*Total dissolved solids	≤ 4,375 mg/L	Water sample
*Conductivity at 25°C	≤ 7,000 micromhos/cm	Vertical Profile
*Nitrates as N	≤ 88 mg/L	Water sample
*pH	≥ 6.0 to ≤ 9.5 units	Vertical Profile
Total Petroleum Hydrocarbons	≤ 10 mg/L	Water sample
Oil and grease	≤ 10 mg/L	Water sample

Criteria for irrigation waters:

Parameter	Criteria	Sample origin
*Conductivity at 25°C	≤ 4,345 micromhos/cm	Vertical Profile
*Sodium adsorption ratio	≤ 10	Water Sample

Water sample data generally constitute parameters collected in a water sample approximately 0.5 meters from the surface and in some instances 0.5 meters from the bottom, at a particular monitoring station or composited from multiple stations or depths throughout the water column. Water samples require laboratory analysis and include water quality standard parameters such as nitrates, ammonia, alkalinity, total suspended solids, total dissolved solids, fecal coliform and *E. coli*. All available water sample data for a particular lake were used to analyze percent exceedances and ultimately make listing decisions.

Lakes are considered impaired if water quality standard parameters associated with a water sample exhibit greater than 10% exceedances when 20 or more samples are available. If less than 20 samples are available, three exceedances are considered impaired. Impairment is assigned to toxic parameters (i.e., Total Ammonia Nitrogen as N) if more than one violation occurred in the last three years.

Water column profiles are generally collected during lake sampling visits. Profile data are collected at different depth increments from the surface to the bottom at multiple stations

(2-3) throughout a lake to provide spatial coverage. The number of individual measurements is dependent on the depth of the respective water column. Profile measurements are generally recorded at 1.0 meter increments throughout the water column. Water quality standard parameters associated with vertical profiles include: dissolved oxygen, temperature, pH and specific conductance.

Lakes are considered impaired specifically for temperature, pH and specific conductance if >10% exceedances (>20 samples) occurred within the entire collection of profile measurements available for the specified 10-year period. When <20 samples were available, 3 exceedances were considered an impairment. The initial surface temperature and pH values for each station were not included in the profile data to avoid anomalous values associated with environmental conditions at the air-water interface.

Shallow well-mixed lakes were also considered impaired for dissolved oxygen if >10% exceedances (>20 samples) occurred within the entire collection of profile measurements available for the specified 10-year period. When <20 samples were available, 3 exceedances were considered an impairment. Bottom dissolved oxygen readings were excluded from the datasets to avoid anomalous values associated with the sediment-water interface. For deeper thermally stratified lakes, dissolved oxygen measurements were evaluated exclusively within the epilimnion and metalimnion.

The epilimnion, metalimnion and hypolimnion are defined in the Surface Water Quality Standards (74:51:01:01) as follows:

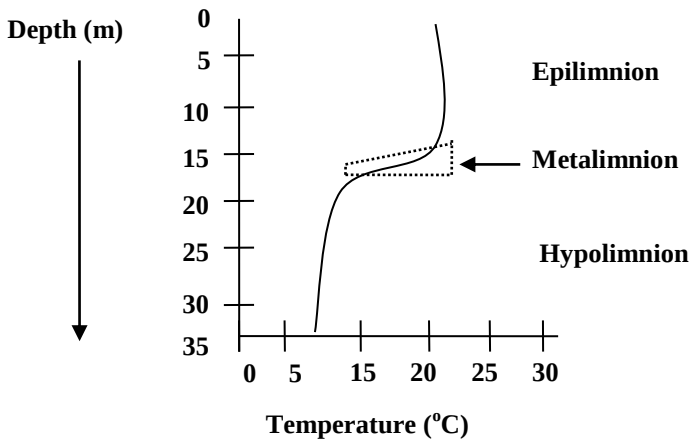
“Epilimnion,” in a thermally-stratified waterbody, the upper stratum of the water column. This layer is generally above the thermocline and is typically uniformly warm, circulating, and well mixed.

“Metalimnion,” in a thermally-stratified waterbody, the middle layer of a water column generally encompassing the thermocline, is typically somewhat mixed and influenced by the epilimnion.

“Hypolimnion,” in a thermally-stratified waterbody, the bottom layer of water column. This layer is generally below the thermocline and is typically less well mixed (at times, stagnant), colder than the epilimnion, and often of essentially uniform temperature.

Wetzel (2001) defines the thermocline as the plane of maximum rate of decrease of temperature with respect to depth. When thermal stratification was graphically evident and a well-defined epilimnion, metalimnion, and hypolimnion were present, only the dissolved oxygen data associated with the epilimnion and metalimnion were included in the collective dataset to calculate percent exceedances (Figure 2).

Figure 2: Diagram Depicting Classic Thermal Stratification and Associated Limnetic Zones



If thermal stratification was not well defined an alternate process was used to evaluate whether an epilimnetic zone was present. In such instances, the epilimnion was determined by identifying the depth of the water column above the greatest thermal variation as defined by a change of greater than 1°C per meter (Wetzel 2001). The water column above this zone of temperature deviation was considered representative of the epilimnion.

Some lakes have various depths and degrees of stratification among sites and sampling events. All representative dissolved oxygen values based on previously described criteria were collectively pooled and evaluated based on a percent exceedance. Again, if greater than 10% exceedances (>20 samples) of the dissolved oxygen standard were observed within the collective profile measurements, the lake was considered impaired for dissolved oxygen and non-supporting the corresponding beneficial uses. If less than 20 samples were available, three exceedances were considered an impairment.

Waterbodies were also evaluated based on beach closures, fish kills, and fish consumption advisories. Beach closure information collected during this reporting period (2010 – 2011) was used to make impairment decisions. Lakes were listed if three beach closures per season occurred in a consecutive three week sampling period.

Beneficial use support determinations made by South Dakota for border waters may differ from determinations made by bordering states. Each state may have different beneficial uses assigned for the waterbody with different applicable water quality standards. In addition, differences in monitoring strategy, assessment methodology, and other factors may affect the support determination.

STATEWIDE SURFACE WATER QUALITY SUMMARY

South Dakota has a total of about 9,289 miles of perennial rivers and streams (Table 1). Major or significant streams in this context are waters that have been assigned fish life use support in addition to the beneficial uses of (9) Fish and wildlife propagation, recreation, and stock watering; and (10) Irrigation. This definition includes primary tributaries and, less frequently, subtributaries of most state rivers and larger perennial streams. In a few cases, lower order tributaries may be included, for example in the Black Hills area, which has a relatively large number of permanent streams.

Approximately 6,388 miles of rivers and streams have been assessed to determine water quality status for a period covering the last five years (October 2006 through September 2011). The five year time span is necessary to ensure enough data points are available for each stream segment to properly characterize existing stream conditions and adequately portray the natural variability in water quality.

Currently, 35% of the assessed stream miles fully support all assigned beneficial uses, an increase from 33% in the 2010 Integrated Report. Sixty-five percent do not presently support one or more uses. The high percentage of impairment can be attributed largely to high levels of total suspended solids (TSS), *E. coli*, and fecal coliform bacteria. Elevated bacteria and TSS are generally associated with high flow events that were sampled during watershed assessment projects.

During this reporting cycle, 6,106 designated miles were assessed for fishery/aquatic life beneficial use attainment. Fifty-three percent of assessed stream miles fully supported the fishery/aquatic life uses, similar to 54% in the 2010 Integrated Report. 1,385 miles were also assessed for immersion recreation attainment. Fifty-four percent fully supported immersion recreation criteria, unchanged from the 2010 Integrated Report.

Nonsupport in assessed streams was caused primarily by TSS from agricultural nonpoint sources and natural origin. In approximate order of stream miles affected, causes of impairment this reporting cycle include: total suspended solids, fecal coliform, *E. coli*, sodium adsorption ratio (salinity), dissolved oxygen, water temperature, total dissolved solids, specific conductance, alkalinity, and pH. Natural pollutant sources of dissolved and suspended solids are exemplified by erosive soils that occur in western South Dakota badlands and within the Missouri River basin (including considerable exposed marine shale formations) and in extreme southeastern South Dakota (including large areas of highly erodible loess soils). Large storm events that produce significant amounts of precipitation may contribute to suspended sediment problems over large areas of the state, particularly in the west and southeast. Fecal coliform and *E. coli* concentrations also increase significantly during times of above normal rainfall. Appropriate best management practices should be applied to treat the sources of these

and other parameters whose effects are likely to be masked during periods of low precipitation.

In addition to rivers and streams, South Dakota has 572 classified publicly owned lakes and reservoirs totaling approximately 192,219 acres. The 572 lakes are listed in ARSD Chapter 74:51:02 and classified for aquatic life and recreation beneficial uses. GF&P presently manages approximately 450 state lakes for recreational fishing.

Excluding the four Missouri River reservoirs, an estimated 24% of the 572 lakes have been assessed, accounting for 71% of the total lake acreage. An estimated 66% (72 lakes) of the lake acreage was considered to support all assessed beneficial uses. This is a decrease from 77% in the 2010 Integrated Report. Thirty-four percent (66 lakes) did not support assessed beneficial uses this cycle. The primary causes of non-support are pH, DO, and temperature attributed to natural causes and nonpoint source pollution.

Most lakes in the state are characterized as eutrophic to hypereutrophic. They tend to be shallow, turbid, and are well supplied with dissolved salts, nutrients, and organic matter from often sizeable watersheds of nutrient rich glacial soils that are extensively developed for agriculture. Runoff carrying sediment and nutrients from agricultural land is the major nonpoint pollution source.

The mileage/acreage of use support, causes, and potential sources of impairment for assessed surface waters in South Dakota are summarized in Tables 9 through 16.

Table 9: 2012 Category Status for Rivers and Streams in South Dakota vs 2010

2012			2010		
EPA Category	Total Size (miles)	Number of Assessment Units	EPA Category	Total Size (miles)	Number of Assessment Units
1	1,437.51	55	1	1,599.28	56
2	803.35	17	2	480.07	12
3	559.07	33	3	755.62	37
4A	762.34	27	4A	311.23	12
4B	0	0	4B	0	0
4C	0	0	4C	0	0
5	3,384.79	92	5	3,816.05	106

Table 10: 2012 Category Status for Lakes in South Dakota vs 2010

2012			2010		
EPA Category	Total Size (acres)	Number of Assessment Units	EPA Category	Total Size (acres)	Number of Assessment Units
1	88,673.33	61	1	102,628.8	63
2	1,462.17	11	2	2,112.88	15
3	9,269.17	13	3	9,332.69	12
4A	48.87	3	4A	27.91	1
4B	0	0	4B	0	0
4C	0	0	4C	0	0
5	46,507.91	63	5	30,806.89	53

Table 11: Designated Overall Use Support Status for Rivers and Streams in South Dakota

Type of Waterbody: Rivers and Streams (miles)			
Degree of Use Support	Assessment Basis		Total Assessed
	Evaluated	Monitored	
Miles Fully Supporting	-	2,207	2,207
Miles Insufficient Data but Threatened	-	-	
Miles Not Supporting	-	4,181	4,173
TOTAL	-	6,388	

Table 12: Designated Overall Use Support Status for Lakes and Reservoirs in South Dakota

Type of Waterbody: Lakes and Reservoirs (acres)			
Degree of Use Support	Assessment Basis		Total Assessed
	Evaluated	Monitored	
Acres Fully Supporting	-	90,136	90,136
Acres Insufficient Data but Threatened	5,314	-	5,314
Acres not Supporting	-	41,423	41,423
TOTAL	5,314[a]	131,559	

[a] These lakes were only evaluated by fish flesh data, no water quality data were collected for this report cycle.

Table 13: Individual Use Support Summary for Rivers and Streams

Beneficial Use	Miles Fully Supporting	Miles Not Supporting	Miles Threatened	Miles With Insuff. Info. Or Not Assessed	Miles Assessed
Overall Use Support	2,241	4,147	-	559	6,388
Domestic Water Supply	827	-	-	7	827
Coldwater Permanent Fish Life	407	257	57	1	721
Coldwater Marginal Fish Life	144	30	-	12	174
Warmwater Permanent Fish Life	323	465	-	11	788
Warmwater Semipermanent Fish Life	1,211	1,515	150	102	2,875
Warmwater Marginal Fish Life	1,164	334	49	205	1,548
Immersion Recreation	745	640	-	36	1,385
Limited Contact Recreation	2,852	1,930	456	1,184	5,238
Fish/Wildlife Prop., Rec., and Stock Watering	5,993	246	-	707	6,240
Irrigation	5,245	620	375	707	6,240
Commerce and Industry	527	-	-	-	527

Mileage values generated by ADB are carried out to the 100th decimal place. The table reflects mileage values rounded to the nearest whole number and may not add up correctly due to rounding error.

Table 14: Individual Use Summary for Lakes and Reservoirs

Beneficial Use	Acres Fully Supporting	Acres Not Supporting	Acres Threatened	Acres with Insuff. Info. Or Not Assessed	Acres Assessed
Overall Use Support	90,136	46,557	-	9,269	136,693
Domestic Water Supply	7,995	-	-	-	7,995
Coldwater Permanent Fish Life	853	822	-	-	1,675
Coldwater Marginal Fish Life	146	17	-	-	163
Warmwater Permanent Fish Life	54,982	17,834	106	1,116	72,922
Warmwater Semipermanent Fish Life	26,104	11,706	375	204	38,185
Warmwater Marginal Fish Life	16,085	5,907	-	9,232	21,992
Immersion Recreation	119,886	9,378	-	16,224	129,264
Limited Contact Recreation	119,886	9,378	-	16,224	129,264
Fish/Wildlife, Prop., Rec., and Stock Watering	128,531	390	4,833	11,506	133,754
Irrigation	38,708	5,070	-	-	43,778

Acreage values generated by ADB are carried out to the 100th decimal place. The table reflects mileage values rounded to the nearest whole number and may not add up correctly due to rounding error.

Table 15: Total Sizes of Water Impaired by Various Cause Categories in South Dakota

River/Streams	
Causes/Stressor Category	**Miles**
Cadmium	2
Fecal Coliform	1,878
Dissolved Oxygen (DO)	527
pH	83
Salinity/SAR	897
Specific Conductance	231
Temperature	347
Total Dissolved Solids (TDS)	245
Total Suspended Solids (TSS)	1,925
Alkalinity	87
E. coli	1,682
Lakes/Reservoirs	
Cause/Stressor Category	**Acres**
Dissolved Oxygen (DO)	8,505
Chlorophyll-*a*^	3,674
Mercury in fish tissue (consumption advisories)	5,405
Nitrates	55
pH	11,557
Selenium	55
Specific Conductance	55
Temperature	13,791
Total Dissolved Solids (TDS)	55
Salinity/SAR	5,070

Mileage/acreage values generated by ADB are carried out to the 100th decimal place. The table reflects mileage values rounded to the nearest whole number.
^EPA added

Table 16: Total Sizes of Waters Impaired by Various Source Categories in South Dakota

Rivers/Streams	
Source Category	**Miles**
Acid Mine Drainage	2
Source Unknown	127
Crop Production (including irrigated and non-irrigated crop production)	826
Grazing in Riparian or Shoreline Zones	475
Streambank Modification	77
Impacts from Abandoned Mine Lands	2
Livestock (Grazing or Feeding Operations)	1,350
Municipal (Urbanized High Density Area)	5
Natural Sources (including drought-related impacts)	1,286
On-Site Treatment Systems	67
Rangeland Grazing	87
Residential Districts	17
Wet Weather Discharges	14
Wildlife	498
Lakes/Reservoirs	
Source Category	**Acres**
Natural Sources	5,554
Nonpoint Sources	4,517
Unknown Sources	3,674

Mileage values generated by ADB are carried out to the 100th decimal place. The table reflects mileage values rounded to the nearest whole number.

Not all sources of impairment have been identified for this reporting cycle. Unidentified sources of impairment have been left blank in Tables 24 – 37 and are not included in the above summary table. Sources of impairment are based on best professional judgment. A formal evaluation of the source of impairment is identified during watershed assessments and TMDL development. In the basin tables, sources are not listed in any particular order and the reader should not assume the source list order lends greater significance.

The most common impairment source for lakes in South Dakota is a combination of natural and agricultural nonpoint source pollution. To avoid redundancy, these sources were not added to the source description in Tables 24-37. Lake impairment sources were only added to the basin tables if identified as something other than natural and agricultural nonpoint source pollution. The lake acreage associated with other identified impairment sources are reflected in Table 16. All other impaired lake acres in South Dakota assume a combination of natural and agricultural nonpoint source pollution.

STATEWIDE PROBABILISTIC LAKE ASSESSMENT

During 2010 and 2011 DENR used a probabilistic design within the lake monitoring program. A Generalized Random Tessellation Stratified survey design was implemented with assistance from EPA Office of Research and Development. The data collected through this effort yielded statistically valid results for the entire population of fishery classified lakes within the state.

The sample population consisted of the 572 lakes in South Dakota that are assigned warm or coldwater fishery beneficial use designations. The survey design used two strata; targeted lakes and all other classified lakes. One hundred lakes were selected for the 2010 and 2011 seasons. Final weightings were adjusted based on the lakes that were sampled. During the assessment, a total of 81 individual waterbodies were assessed. The data from the two years were combined to generate a single analysis of the condition of the lakes for the 2012 reporting cycle.

Population Description

South Dakota has 572 lakes identified in the Surface Water Quality Standards as supporting either a coldwater or warmwater beneficial use. The Missouri River main stem reservoirs are excluded from this dataset. These lakes were selected based on characteristics such as depth, size, and permanency. Figure 3 depicts the size distribution of the classified lakes in the state. There are numerous waterbodies in the state which have not yet been evaluated and assigned a fishery beneficial use classification. Confidence intervals (margin of error) varied from 5% to 10% dependent on number of measurements collected. Results that fall within the confidence interval are statistically similar.

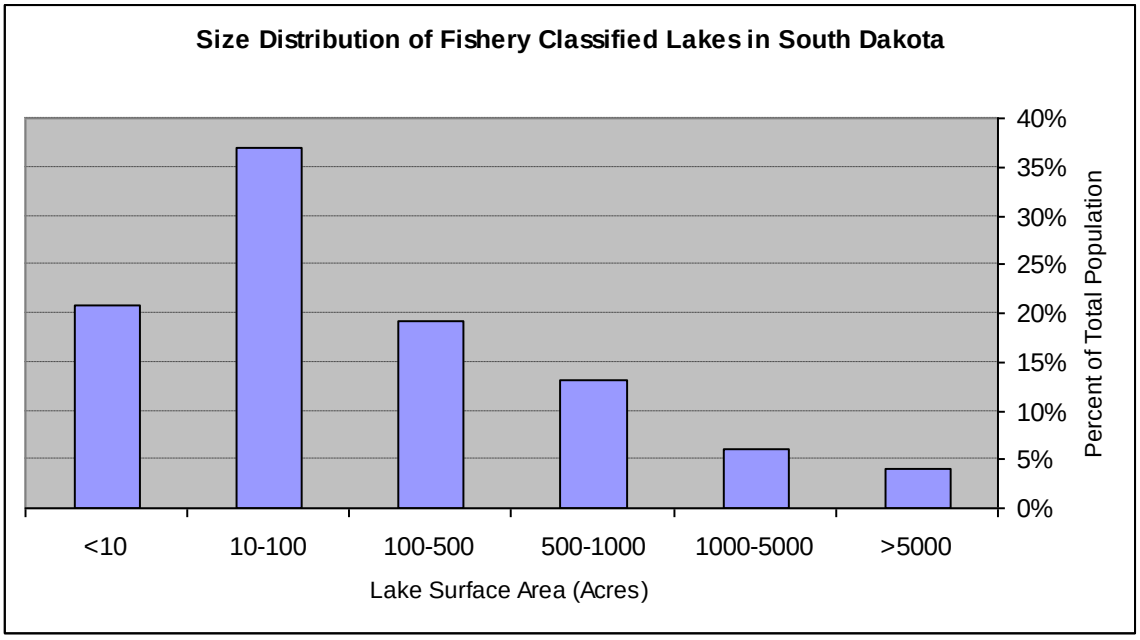


Figure 3: Size Distribution of Fishery Classified Lakes

All lakes are designated the use of fish and wildlife propagation, recreation and stock watering. Water quality standards have been defined in South Dakota state statutes in support of these uses. These standards consist of suites of numeric criteria that provide physical and chemical benchmarks from which management decisions may be developed.

Lakes are assigned a fishery beneficial use based on the type of fish and survival rates that are expected in that waterbody. Warmwater fisheries can support their expected communities at greater temperatures and with lower dissolved oxygen concentrations than coldwater fisheries. Warmwater marginal fisheries are typically shallow systems (3 meters or less) prone to winter kill while warmwater permanents are expected to support a reproductive fishery during most years.

Coldwater permanent fisheries are expected to have little chance of winter kill and sustain a coldwater reproductive fishery. Coldwater marginal fisheries are more reflective of the species desired in the waterbody than its ability to support a reproductive community. These waterbodies are frequently managed as "put and take" fisheries where catchable size fish are released for public consumption with limited expectations on survival from year to year or reproduction potential.

E. Coli

To determine the percent of lakes that support their recreational use standards, bacterial samples were collected around the first of June from each of the waterbodies and analyzed for *E. coli* bacteria. Sample site selection was conducted at the arrival at each waterbody. Sites were selected based on their likelihood of human use and contact. Boat launches and developed recreation areas were used as a first choice. In the absence of any sort of developed access or visible commonly used access point, samplers were instructed to collect the sample by wading in at the most convenient access point available. During 2009, an *E. coli* standard was implemented in state regulations for both immersion and limited contact recreation.

During the 2008 and 2009 sampling seasons, *E. coli* were found in exceedance of the immersion recreation standard (maximum of 235 colonies/ 100mL) for 9% of lakes. The limited contact standard of 1178 colonies/ 100mL was exceeded in 1.3% of the waterbodies. During the 2010 and 2011 sampling season 6.2% of waterbodies were above the immersion recreation standard while there were no violations of the limited contact standards. Although the percentages have decreased slightly, they are within the confidence intervals for the study.

Dissolved Oxygen

Dissolved oxygen (DO) concentrations are a critical standard for aquatic life survival. South Dakota Water Quality Standards require minimum concentrations based on the fishery classification of the waterbody. Recreation standards are set at a minimum of 5 mg/L for both immersion and limited contact. DO standards apply anywhere in the water column of a non-stratified waterbody or in the epilimnion and metalimnion of a stratified waterbody. Standards are listed in Table 17.

Table 17: Dissolved Oxygen Criteria

Fishery		Condition	Min DO
Coldwater	Permanent	Daily Minimum	6.0
		In spawning areas during spawning season.	7.0
	Marginal	Daily Minimum	5.0
Warmwater	Permanent	Daily Minimum	5.0
	Semi-Permanent	Daily Minimum	5.0
	Marginal	Oct 1 to April 30	4.0
		May 1 to Sept 30	5.0

Measurements recorded near the bottom of lakes tend to be lower in DO than those measured at or near the surface. This condition is expected in lakes that have sufficient depth to prevent mixing, resulting in stratification. Mixing depth is variable between lakes, but most frequently appears between one and three meters of depth. Bottom measurements were lower than standards in 32.5% of the lakes, while 2.3% of surface samples had depleted DO measurements.

The 2010 IR analysis indicated that 17% of waterbodies violated the DO standard in the lower half of the water column. Results of the 2012 IR analysis show 10% of waterbodies violated the DO standard in the lower half of the water column. The reduction of 17% to 10% is significantly different, indicating that fewer lakes were experiencing DO deficiencies in the lower half of the water column between the 2010 and 2012 reporting cycles.

pH

The standard for all of the fishery classified lakes in South Dakota is a maximum pH of 9.0. Historically, South Dakota lakes and reservoirs have not had acidity problems resulting in pH values below the minimum of 6.0 water quality standards. References to standard violations are limited to lakes that exhibited pH values in excess of 9.0. Elevated pH values are frequently linked to highly productive waterbodies as a result of photosynthetic activity from plants and algae within the water column. Lakes in the plains portion of the state have higher alkalinity levels than those in the Black Hills. The high alkalinity concentrations result in a greater ability of those waterbodies to buffer against shifts in pH. The reservoirs in the Black Hills have considerably lower alkalinity levels than the plains lakes and are more susceptible to large variations in pH over shorter periods of time.

When considering all measurements collected throughout the water columns, 3.8% of all measurements were above a value of 9.0. When only surface samples are considered, 6.9% of all measurements were above 9.0. Statistically similar results were reported in the 2010 IR.

Temperature

Water column temperatures affect the amount of DO available for aquatic life. Cold water species are less tolerant of low DO and warm temperatures, particularly during spawn. Table 18 indicates the maximum allowable temperatures for the intended beneficial uses.

Table 18: Temperature Criteria

Beneficial Use	Temp F	Temp C
Warmwater Marginal and Semipermanent	90	32.2
Warmwater Permanent	80	26.6
Coldwater Marginal	75	23.9
Coldwater Permanent	65	18.3

Figure 4 depicts the distribution of water column temperatures in the fishery classes measured during the 2010 and 2011 sampling seasons. Coldwater permanents were significantly different from any of the warmwater systems. The warmer (above the standard) temperatures measured in the coldwater systems were during the warmest period of the summer in late July and August and were limited to portions of the epilimnion.

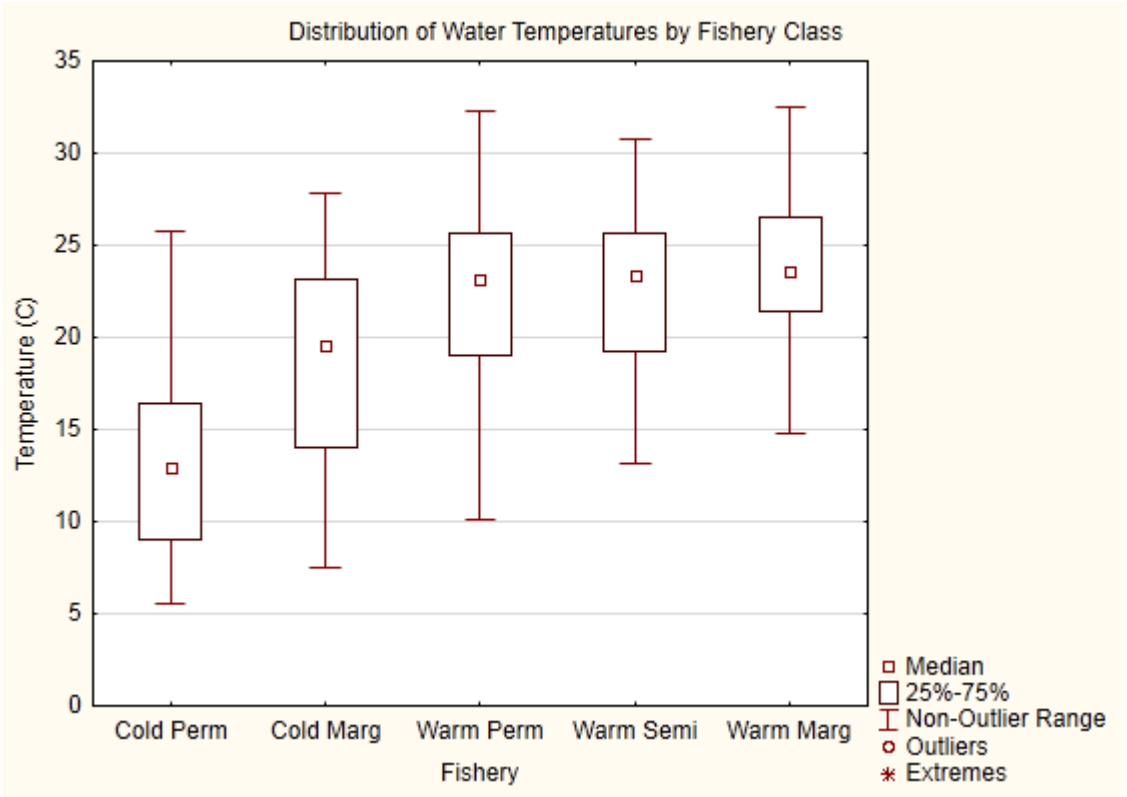


Figure 4: Distribution of Water Temperatures by Fishery Classification

The coldwater fisheries standards (permanent and marginal) were exceeded in a portion of the water column in 88% of waterbodies sampled. High temperatures were recorded at the surface with cooler temperatures (those meeting the standard) found at deeper depths.

Permanent coldwater systems typically exhibited elevated temperatures in the surface samples followed by a rapid decline, such as were exhibited by Sheridan Lake in July of 2010 (Figure 5).

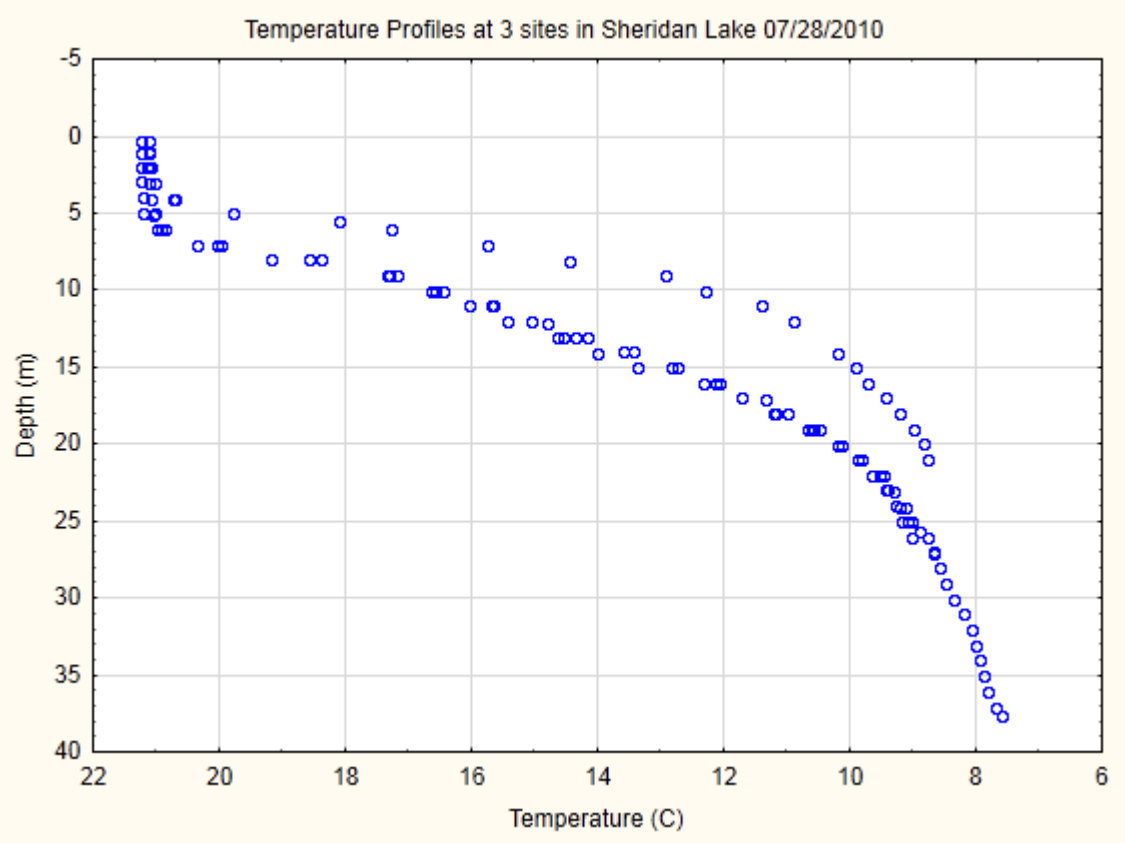


Figure 5: Temperature Profiles of 3 Sites in Sheridan Lake

Temperatures above the standard were recorded at 18% of the warmwater fisheries monitored. Permanent warmwater fisheries were more likely to have temperatures above the standard of 26.6 °C than semi-permanent and marginal fisheries. Similar to the coldwater fisheries, the warmwater fisheries were characterized by high temperatures in the epilimnion with significantly cooler metalimnion and hypolimnions. Lakes that did not have sufficiently cool temperatures anywhere in the water column represented 1.3% of the warmwater fisheries. These results are similar to what was calculated for the 2010 report.

TSI

The trophic state index (TSI) provides a quantitative measure of a lakes trophic state. TSI is not a water quality standard parameter though it is often used to characterize the productivity status of lakes and provides a measure of eutrophication (Table 19). The index is based on regression models and logarithmic transformation (scale of 0-100) of three primary trophic state indicators: total phosphorus, Secchi depth transparency, and chlorophyll-*a*. As a function of the regression models, all parameters are in theory interrelated though the chlorophyll-*a* component is the best indicator of biological productivity or algal biomass (Carlson 1977, 1991).

Table 19: Lake Algae/TSI Gradient

	(ug/L)	SD (m)	TP (ug/L)	Attributes	Water Supply	Fisheries & Recreation
<30	<0.95	>8	<6	**Oligotrophy:** Clear water, oxygen throughout the year in the hypolimnion	Water may be suitable for an unfiltered water supply.	Salmonid fisheries dominate
30-40	0.95-2.6	4-8	6-12	Hypolimnia of shallower lakes may become anoxic		Salmonid fisheries in deep lakes only
40-50	2.6-7.3	2-4	12-24	**Mesotrophy:** Water moderately clear; increasing probability of hypolimnetic anoxia during summer	Iron, manganese, taste, and odor problems worsen. Raw water turbidity requires filtration.	Hypolimnetic anoxia results in loss of salmonids. Walleye may predominate
50-60	7.3-20	1-2	24-48	**Eutrophy:** Anoxic hypolimnia, macrophyte problems possible		Warm-water fisheries only. Bass may dominate.
60-70	20-56	0.5-1	48-96	Blue-green algae dominate, algal scums and macrophyte problems	Episodes of severe taste and odor possible.	Nuisance macrophytes, algal scums, and low transparency may discourage swimming and boating.
70-80	56-155	0.25-0.5	96-192	**Hypereutrophy:** (light limited productivity). Dense algae and macrophytes		
>80	>155	<0.25	192-384	Algal scums, few macrophytes		Rough fish dominate; summer fish kills possible

Similar to the 2008-2009 results, nutrient concentrations did not accurately predict trophic conditions within a majority of the lakes (Figure 6). Lakes that exceeded the TSI P value of 80 dropped from 58% to 47%, however lakes in the 70- 80 category increased from 10% to 19%. TSI values based on total nitrogen had a similar shift with a reduction from 18% to 3% in the 70-80 category and an increase of 38% to 46% in the next lower category (60-70). Chlorophyll and Secchi values were relatively similar to the results in the 2010 Integrated Report. This data is consistent with the findings in the 2007 NLA which led to the conclusion that "the traditional limnological concept that biomass production is controlled simply by nutrient concentrations may not apply".

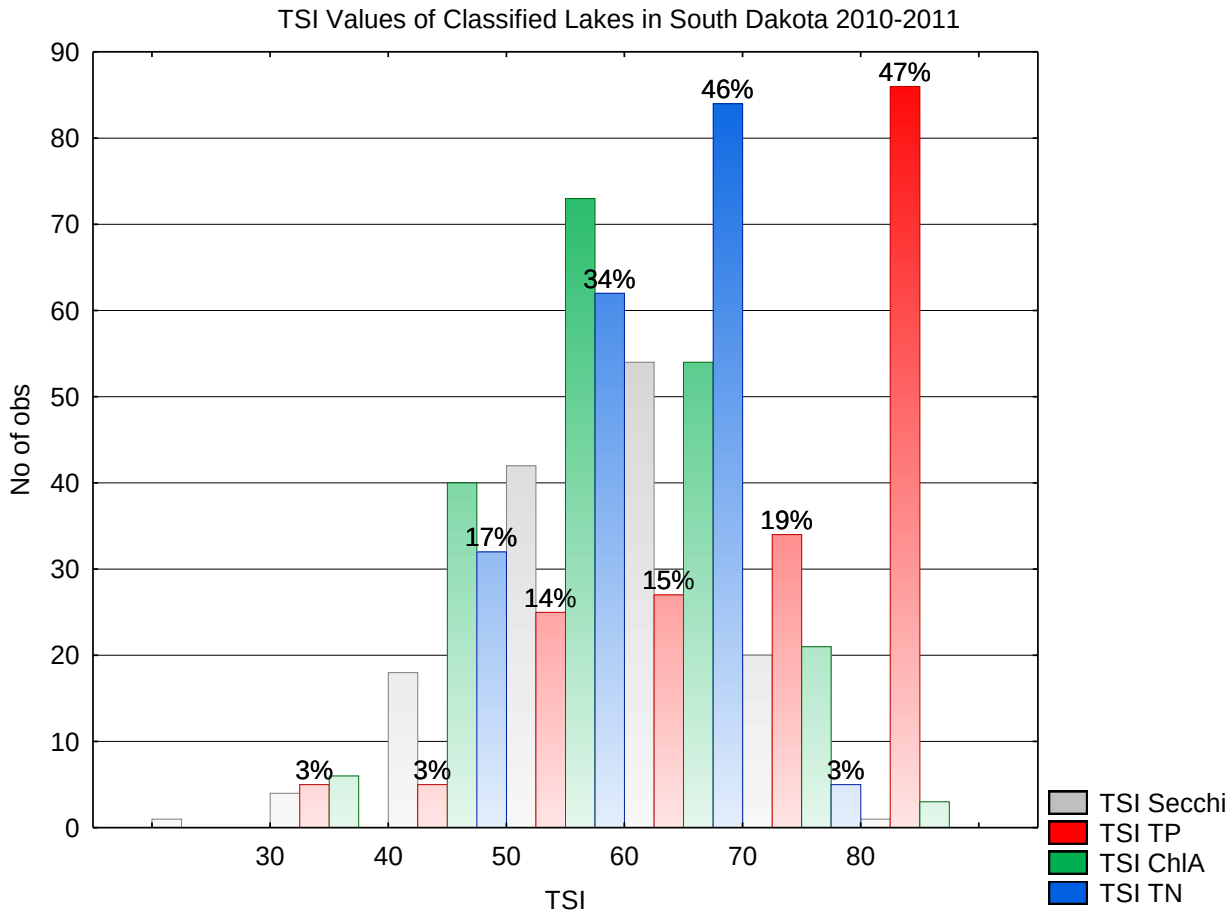


Figure 6: TSI Values of Classified Lakes in SD 2010-2011

An ordination graph derived from Carlson (1991) was generated to explain potential environmental factors associated with deviation between the trophic state indices. In general, most assessed lakes demonstrate non phosphorus limitation as depicted by the negative deviation from the X-axis (Figure 7). Implications for many of the assessed lakes are that some variable other than phosphorus is limiting algal growth. Water transparency in most of the assessed lakes in South Dakota appears to be driven primarily by non-algal turbidity and biological processes like zooplankton grazing.

An interpretation of the graph (Figure 7) suggests that lakes that fall to the right of the Y-axis indicate that water transparency is greater than that expected from the chlorophyll index. This particular deviation could arise if large particles, such as blue-green algae dominate and transparency is typically less affected by these particles. Deviations to the right may also occur if zooplankton grazing removes smaller particles (i.e. diatoms and green algae) and leaves only larger species. Points to the left of the Y-axis relate to conditions where transparency is dominated by small particles typically non-algal turbidity associated with high dissolved organic and/or inorganic (clay) matter.

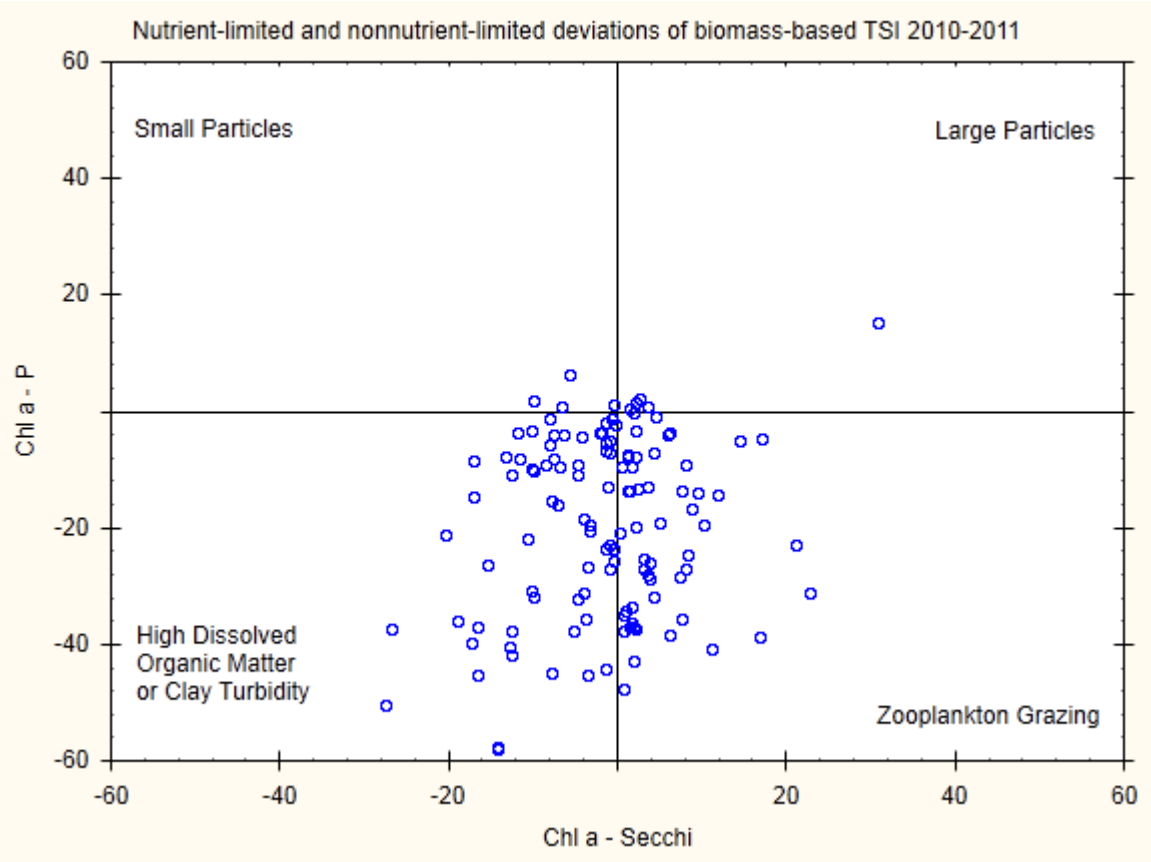


Figure 7: Nutrient Limitation Deviations for Biomass-based TSI

Ninety two percent of classified lakes in South Dakota indicate that some variable other than phosphorus is limiting productivity (Table 20). The greatest percentage of lakes (52%) is potentially limited by non-algal turbidity. The majority of classified lakes are shallow, windswept systems subject to sediment re-suspension and agitation, which is likely to impede the growth of plants and algae relative to nutrient availability.

Table 20: Variables Affecting Lake Productivity

X Axis	Y Axis	Percent of Lakes	
-	-	51.6%	High Dissolved Organic Matter (DOM) or clay turbidity Non P Limited
-	+	3.2%	P limitation
+	-	41.2%	Zooplankton Grazing Non P Limitation
+	+	4.0%	P limitation

Many lakes in South Dakota contain adequate phosphorus concentrations (>0.07 mg/L) to support significant algae biomass with communities dominated by blue-green algae (Downing et al. 2001). As previously demonstrated the chlorophyll-*a* index often deviates significantly from the phosphorus index leading to misclassification of the trophic state.

LAKE WATER QUALITY ASSESSMENT

A total of 572 lakes are currently designated for fishery/aquatic life beneficial uses in South Dakota. Twelve assessed lakes in South Dakota have a surface area greater than 4,000 acres and have a combined surface area of 91,134 acres. Lake monitoring and assessment efforts have been conducted routinely since 1989 as part of the DENR's Statewide Lakes Assessment (SWLA) project. Additional lake data have also been acquired from individual assessment projects and citizens monitoring efforts. Approximately 24% of the 572 classified lakes have been assessed accounting for 70% of the total lake acreage.

Water quality standards designed to protect designated beneficial uses were evaluated for each individual lake. Based on numeric water quality standards, 72 lakes fully supported beneficial uses and 66 failed to support one or more beneficial uses (Table 14). Of the 141 lakes, 3 did not meet the requirements for sufficient data.

The TSI approach was used to determine the trophic state of assessed lakes (Carlson 1977). Parameters used to generate the median TSI value included Secchi depth and chlorophyll-*a*. Phosphorus was not included into the index value. The phosphorus component of the TSI was found to deviate more than ± 5 points from the chlorophyll-*a* TSI (median 11.3) in 82% of the assessed lakes. Carlson (1991) suggests that at this magnitude of deviation, the phosphorus component of the TSI will contribute to the misclassification of a lake's trophic state. Table 21 depicts the trophic status of assessed lakes across South Dakota.

Table 21: Trophic Status of Assessed Lakes

Trophic Status	Number of Lakes	Acreage of Lakes
Total with Beneficial Use Criteria	572	192,219
Total Assessed	124	130,086
Oligotrophic	1	822
Mesotrophic	18	18,415
Eutrophic	63	79,271
Hypereutrophic	42	31,578
Unknown	26	15,704

The major problems of South Dakota lakes continue to be excessive nutrients, algae, and siltation due to nonpoint source pollution (primarily agricultural). Although land-use practices have improved in many agricultural watersheds, internal phosphorus recycling continues to negatively impact the trophic state of many lakes. Aging reservoirs have also become more eutrophic as many are now approaching their expected life spans. Water quality degradation due to acid precipitation, acid mine drainage, or toxic pollutants, is presently not a problem in South Dakota lakes.

Water Resource Assistance Program

The approach used by the South Dakota Water Resource Assistance Program for addressing nonpoint source pollution is to first identify and target sources of pollution and determine alternative restoration methods, and second, to control the sources of pollution and restore the quality of impacted waterbodies. Most phases of the program are state and local efforts, with supplemental technical and financial assistance from EPA and other federal agencies used whenever possible.

The watershed assessment phase encompasses a series of procedures to assess the current condition of selected waterbodies. Included in this phase are water quality, water quantity, and watershed data collection. The state provides the local sponsor with technical assistance, training and equipment to conduct the assessment portion of the project. Generally, the local project sponsor is responsible for collecting the data using 319 federal funding, state grant funding, and existing local resources. Following the collection of sufficient data, the state evaluates the data and prepares a report which details baseline information, identifies sources of pollution, describes alternative pollution control methodologies and outlines implementation costs. A TMDL is then developed using this information. Prior to the implementation of specific pollution control and restoration alternatives, the project sponsor is responsible for the preparation of a watershed/lake restoration plan based on recommendations from the assessment. Technical assistance for this process is provided by DENR. If the plan is approved, the project sponsors are eligible to apply for appropriate state and federal funding.

The majority of the pollution sources that have affected the lakes in South Dakota are agricultural nonpoint sources. DENR Surface Water Quality Program generally prohibits point source discharges to lakes. The methods used to control nonpoint pollution sources are selected on a case-by-case basis. The selection of methods is based on the evaluation of individual watersheds using the USDA Annualized Agricultural Nonpoint Source Model (AnnAGNPS) or a manual inventory of land use, soil type, and nonpoint sources. The AnnAGNPS model delineates critical sub-watersheds within the entire watershed and is then used to predict which control methods would be the most effective. The AnnAGNPS model is also used to track success of best management practices (BMPs).

Following this evaluation, coordination with state and federal agricultural agencies is solicited to verify the critical nature of the identified sub-watersheds and the selected control methods. For those areas targeted as critical, the owners/operators are contacted to request their voluntary participation in the control program. The state does have in effect the Sediment and Erosion Control Act of 1976 which is implemented by individual state conservation districts. However, any action under the Act is based strictly in response to complaints. There are no provisions for forcing compliance on identified problem areas. Specific practices currently recommended for nonpoint source pollution control include large and small sediment control structures, stream bank erosion control, grazing management systems, and the installation of manure management systems.

Lake management in South Dakota is dependent upon many resource management programs and agencies. The Department of Environment and Natural Resources, the Department of Agriculture, U.S. Natural Resources Conservation Service, Department of Game, Fish and Parks, and many local agencies and special purpose districts are all crucial to the protection or restoration of lakes in the state. These groups provide financial and/or technical assistance essential for accomplishing lake water quality goals. Local and county land use zoning ordinances exist in South Dakota and are considered local responsibilities.

In conjunction with the development of recommended pollution control alternatives, the watershed assessment study is also designed to provide recommendations for in-lake restoration alternatives. The primary recommendations provided for lake restoration include, but are not limited to, natural flushing, reducing or eliminating sources of pollution, in-lake alum treatments, and shoreline stabilization. Restoration methods employed in the past also include aeration, sediment removal, weed harvesting, and chemical weed control.

A list of current assessment and implementation projects can be found on the DENR website: http://denr.sd.gov/dfta/wp/tmdlpage.aspx.

Impaired Lakes

A description of each impaired lake is included in the section of this document titled River Basin Assessments. The lakes are listed by their location in each major river basin in the state.

All waters of the state have been assigned the beneficial use of fish and wildlife propagation, recreation, and stock watering (9). The 572 lakes listed in the ARSD have also been assigned one or more of the following beneficial uses:

(1) Domestic water supply waters;
(2) Coldwater permanent fish life propagation waters;
(3) Coldwater marginal fish life propagation waters;
(4) Warmwater permanent fish life propagation waters;
(5) Warmwater semipermanent fish life propagation waters;
(6) Warmwater marginal fish life propagation waters;
(7) Immersion recreation waters;
(8) Limited contact recreation waters;
(9) Fish and wildlife propagation, recreation and stock watering waters;
(10) Irrigation waters; and
(11) Commerce and industry waters.

Acid Effects on Lakes

During Lake Water Quality Assessments, each lake was measured for field pH. Monitoring efforts (January 2001-September 2011), suggest none of the assessed lakes had a pH reading less than 6.5 standard units (Table 22). DENR is not aware of any lakes in South Dakota that are currently impacted by acid deposition. This is attributed to a lack of industrialization and a natural buffering capacity of the soils.

Table 22: Acid Effects on Lakes

	Number of Lakes	Acreage of Lakes
Assessed for pH	138	136,693
Impacted by High Acidity	0	0
Vulnerable to High Acidity	0	0

Trends in Lake Water Quality

The trophic state of a lake can be monitored over time to track changes in water quality for prioritizing management decisions. Long term trends were determined for South Dakota lakes using all available growing season (May 15th-September 30th) data collected during DENR's annual Statewide Lakes Assessment efforts, individual lake water quality assessments projects, and when appropriate, citizens monitoring efforts. The TSI values for chlorophyll-*a*, and Secchi transparency were calculated for each individual sample. The slope of a regression line was calculated for each TSI measurement over time. If a lake had less than two years of data, it was not included due to insufficient data.

Most lakes' TSI values were within 5% slope range indicating stable or non-significant change (Table 23). Six lakes indicated negative slopes exceeding 5% and were considered degrading. In addition, five lakes showed positive slopes above 5% suggesting improvement. Due to the limited timeframe it is difficult to describe the significance of these conditions. However, it is likely due to natural hydrologic conditions associated with wet and dry cycles. In general, most assessed lakes display relatively stable trophic conditions. A significant amount of TSI data is required to cause a change in trend overtime.

Table 23: Long Term Trends in Assessed Lakes (1989-2011)

	Number of Lakes	Lake Acreage
Assessed for Trends	138	136,693
Improving	5	21,826
Stable	125	111,943
Degrading	6	1,391
Unknown	26	15,704
Fluctuating	2	1,533

RIVER BASIN WATER QUALITY ASSESSMENTS

South Dakota has fourteen major river basins, most of which drain into the Missouri River (Figure 8). The basin boundaries were redefined and certified by USGS in February 2008. As a result, some lakes are now located in a different basin than previous cycles. The following sections contain brief narratives that discuss noteworthy waterbodies and pollution problems. A detailed state map showing assessed lakes and streams provides general use support information (Figure 9). More specific information is provided in the accompanying river basin tables for the monitored waterbodies in each river basin that is identified in Figure 8 and shown in Figure 9.

Most water quality data used to evaluate waterbody reaches derives from the DENR ambient water quality monitoring program and individual watershed assessment projects. The fixed ambient monitoring network presently consists of 151 active in-stream stations. The collected data are evaluated to define water quality in the state, identify pollution, and report changes in the state's water quality.

Stream sampling station locations are determined by assessing areas located within high quality beneficial use classifications, located above and below municipal/industrial discharges, or within problem watersheds. Currently, DENR collects samples at those locations on either a monthly, quarterly, or seasonal basis for nutrient, bacterial, or

general physical and chemical parameters. Stations that are located near historic hard rock mines are also analyzed for cyanide and ten metals, including arsenic. Stations that are located near historic uranium mining sites or current uranium exploratory sites are also sampled for four other metals including uranium and two forms of radium radionuclides. Streams located near the perimeter of the proposed Hyperion oil refinery in Union County are also monitored for petroleum analytes. Several stations are sampled for sodium, calcium, and magnesium during the irrigation season. This type of water sampling is used to track historical sampling information, natural background conditions, and runoff events, and can indicate possible acute or chronic water quality problems.

The samples are handled in accordance with DENR's Quality Management Plan and Surface Water Quality Program Quality Assurance Project Plan. Sample test results are entered into DENR's NR92 Database. DENR is in the process of testing data flows to EPA's STORET via the Water Quality Exchange schema.

Lake monitoring within each river basin is conducted in conjunction with the Watershed Assessment Program's Statewide Lake Assessment project. Many of the standard parameters measured in streams are also evaluated for state lakes with the addition of Secchi disk transparency, chlorophyll-*a* level, oxygen/water temperature profiles, and total volatile solids. Similarly, in the course of sampling lakes and streams, any pollution sources of environmental conditions that may affect water quality are noted by field personnel.

Baseline data show whether or not a waterbody is meeting its assigned water quality beneficial uses. A description of the procedure involved is found in the methodology section of this document. Baseline data evaluations are used as a management tool to determine the effectiveness of control programs on existing point and nonpoint sources and for directing future control activities.

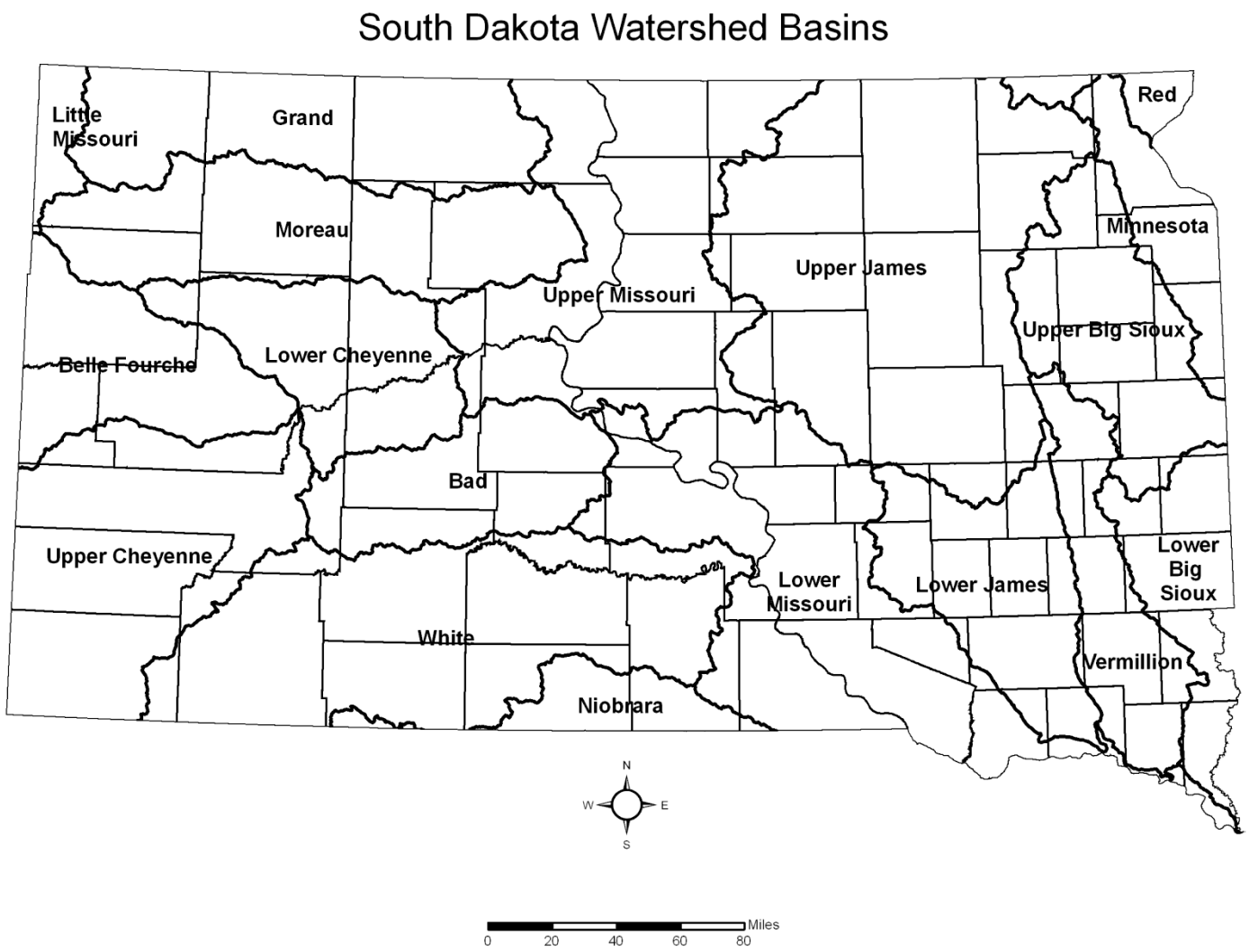


Figure 8: Major River Basins in South Dakota

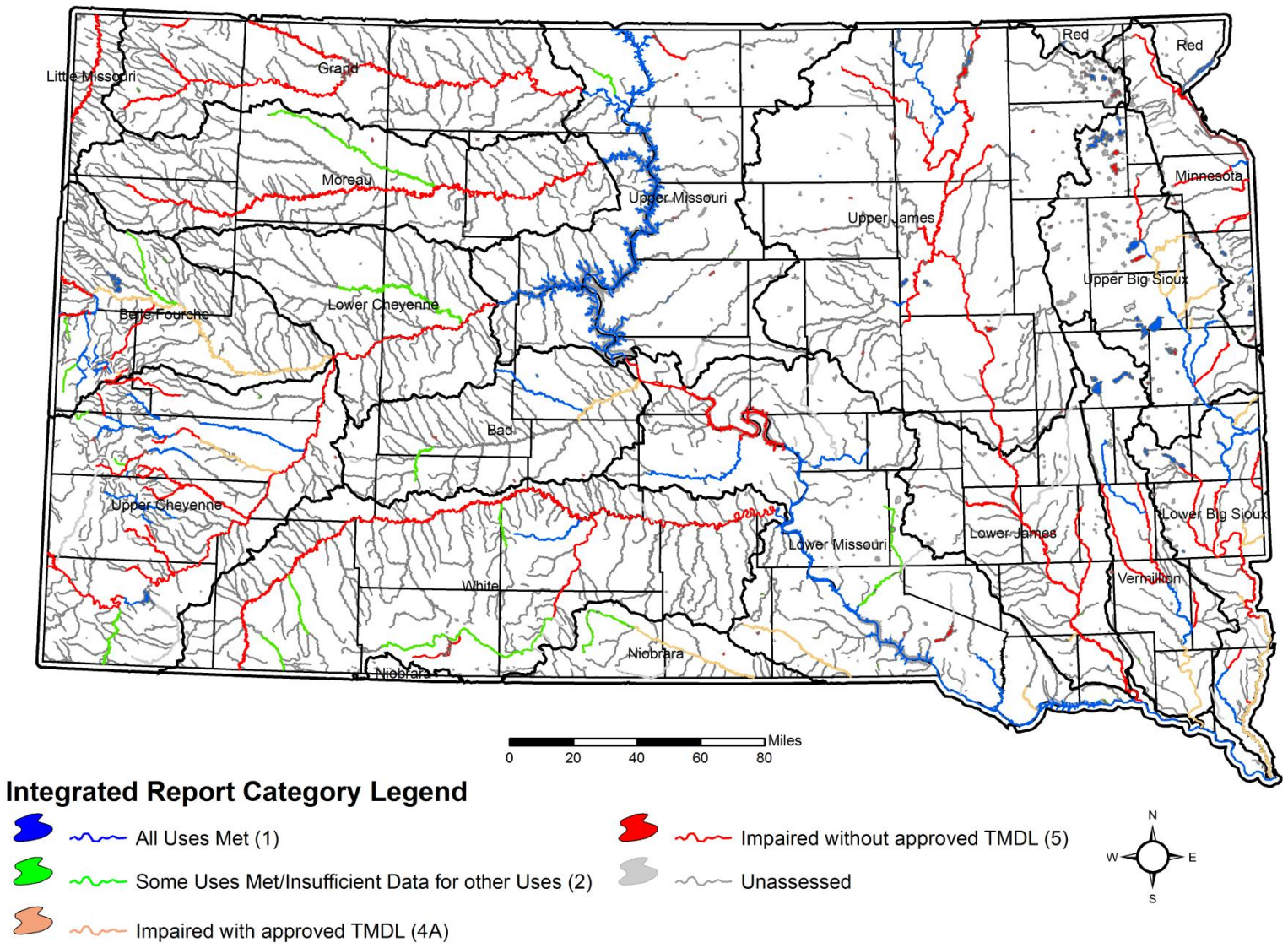


Figure 9: 2012 South Dakota Waterbody Status

KEY FOR RIVER BASIN INFORMATION TABLES

Waterbody- Name of Waterbody
Location- Best available description or reach segment
Map ID- Map identification
Basis- Monitoring agency
Use- Beneficial use assigned to waterbody

EPA Category- EPA Support Category
Category 1: All designated uses are met;
Category 2: Some of the designated uses are met but there is insufficient data to determine if remaining designated uses are met;
Category3: Insufficient data to determine whether any designated uses are met;
Category 4A: Water is impaired but has an EPA approved TMDL;
Category 4B: Water is impaired but implementation project (best management practices) is in place;
Category 4C: Water is impaired by a parameter that is not considered a "pollutant;" or
Category 5: Water is impaired or threatened and a TMDL is needed.

Support status (lakes and streams):
Full = Full Support
Non = Nonsupport
INS = Insufficient sampling information (limited sample data)
NA = No sample data for the given beneficial use (not assessed)
TH = Threatened
* = Waterbody has an EPA approved TMDL

Source Categories -
Point Sources
Controlled by permit
Industrial
Municipal
Combined sewer (end-of-pipe)
Storm sewers (end-of-pipe)
Nonpoint Sources (includes agriculture sources)
Residential districts
Agriculture Sources
Non-irrigated crop production
Irrigated crop production
Pasture land
Range land
Animal feeding operations (non-regulated)
Livestock
Grazing
Hydromodification
Channelization Streambank modification/destabilization
Dredging Removal of riparian vegetation
Dam construction
Flow regulation/modification
Bridge construction

Bad River Basin (Figure 10, Table 24)

The Bad River basin lies in west-central South Dakota between the Cheyenne and White River basins and drains approximately 3,175 square miles. Historically, a main characteristic of the basin has been a general lack of constant river flow. The upper portion of the Bad River receives water from the Badlands and artesian wells in the Phillip area. These wells contribute minimal flow to the upper portion of the Bad River. There are prolonged periods of low flow in the Bad River reach from Midland to the Missouri River.

DENR has assessed four lakes within the basin and also has one water quality monitoring site located on the Bad River. During the 2010 reporting cycle EPA added Lake Waggoner to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

The USGS has water quality monitoring sites on the Bad River and on some of the intermittent streams in the basin on Plum Creek, the South Fork Bad River, and an unnamed tributary of Cottonwood Creek. However, the data are very limited, and for most sites, the only parameters that were measured were specific conductance and water temperature.

The Bad River, from the Stanley County line to the mouth, is currently not supporting its designated beneficial uses due to exceedances of TSS. A TMDL was approved for TSS in 2001. The Bad River, from its north and south forks to the Stanley County line has not been assessed. There are no current watershed assessment or implementation projects ongoing in the Bad River Basin.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 24: Bad River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Freeman Lake SD-BA-L-FREEMAN_01	Jackson County	L1	DENR	Fish/Wildlife Prop, Rec, Stock	NON	Nitrates Specific Conductance Total Dissolved Solids	Natural Sources	5*	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Oxygen, Dissolved Selenium	 Natural Sources		
Hayes Lake SD-BA-L-HAYES_01	Stanley County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Murdo Dam SD-BA-L-MURDO_01	Jones County	L3	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Oxygen, Dissolved			
Waggoner Lake SD-BA-L-WAGGONER_01	Haakon County	L4	DENR	Domestic Water Supply	FULL			5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Chlorophyll-a ^	Source Unknown		
				Limited Contact Recreation	NON	Chlorophyll-a ^			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a ^			
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Bad River SD-BA-R-BAD_01	Stanley County line to Mouth	R1	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	NON	Total Suspended Solids			
Plum Creek SD-BA-R-PLUM_01_USGS	Near and below Hayes, SD	R2	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Irrigation Waters	FULL				
South Fork Bad River SD-BA-R-S_FORK_BAD_01_USGS	Near Cottonwood, SD	R3	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	INS				
Unnamed tributary of Cottonwood Creek SD-BA-R-UNNAMED_TRIB_COTTONWOOD_01_USGS	Near Quinn, SD	R4	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Irrigation Waters	FULL				

Bad River Basin

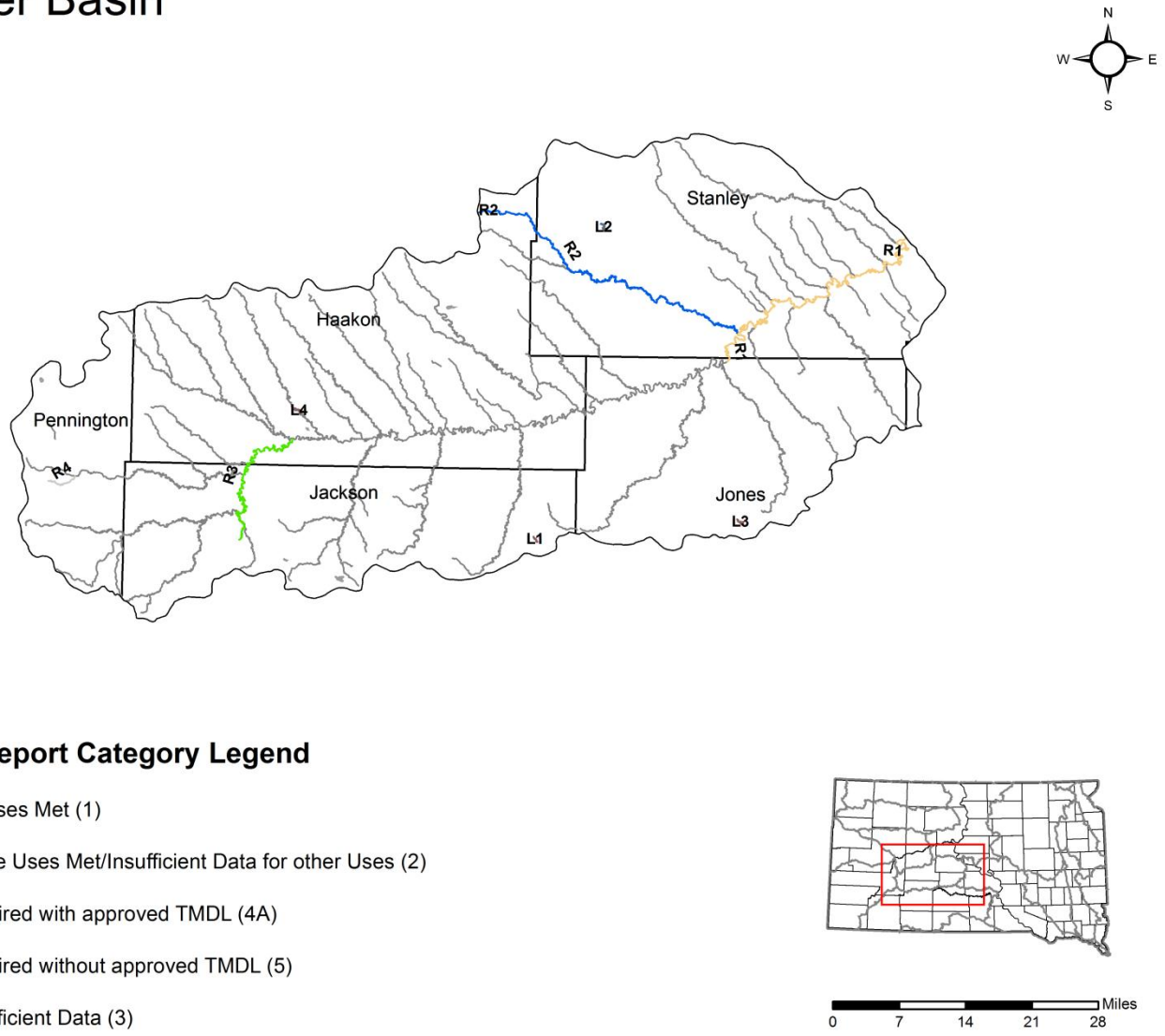


Figure 10: Bad River Basin

Belle Fourche River Basin (Figure 11, Table 25)

The Belle Fourche River basin lies in western South Dakota between the Cheyenne and Moreau River basins and drains approximately 3,271 square miles in South Dakota. The upper portion of the basin contains one active and several historic hard-rock mining operations. The middle and lower portion of the basin is mainly used for livestock watering and irrigation.

DENR has assessed six lakes and maintains 30 water quality monitoring sites on several streams within the Belle Fourche basin. Five water quality monitoring sites are located on the Belle Fourche River, six are located on Spearfish Creek, and seven are located on Whitewood Creek. The rest are located on various other streams. Most of the streams are routinely monitored for toxic pollutants, such as heavy metals, because a number of hardrock mining operations are or were located in this basin. Available data from DENR watershed assessment projects were also used to determine waterbody support. All DENR data, including WQM, assessment projects, implementation projects, citizens monitoring, special assessments, and other DENR funded projects, are all labeled as DENR as the basis in the basin tables.

The USGS has water quality monitoring sites on the Belle Fourche River, Crow Creek, Horse Creek, Little Spearfish Creek, Spearfish Creek, Willow Creek, and other waterbodies within the basin. The data on some streams are fairly extensive and include information on dissolved oxygen, pH, specific conductance, water temperature, and sodium adsorption ratio. Data collected on all USGS sites were analyzed for this report. In addition, Wharf Resources submitted stream monitoring data for waterbodies located near mining areas. BOR submitted lake monitoring data for Orman Dam.

Past and current assessments show Spearfish Creek generally supports its beneficial uses; however, two segments near Elmore showed elevated pH in 2006. The elevated pH is due largely to the limestone formations located along the course of the stream (natural conditions). For the 2010 Integrated Report, there were no pH violations in the 5-year data set; therefore, pH was delisted from both segments. In this 2012 Integrated Report, all segments of Spearfish Creek are fully supporting their beneficial uses.

Strawberry Creek is impacted by historic mining activity and acid mine drainage. One of the contributing sources of impairment was from Brohm Mining Corporation's Gilt Edge Mine. In July 1999, Brohm Mining Corporation's parent corporation, Dakota Mining, declared bankruptcy, and the state of South Dakota took over water treatment. On December 1, 2000, the site was listed on the National Priorities List as a Superfund Site. Remediation activities at Gilt Edge Mine are contracted by EPA to Camp Dresser McGee Consulting. Due to remediation activities, copper, low pH, and zinc were delisted as impairment causes in the 2010 cycle. Strawberry Creek continues to be nonsupporting for exceeding chronic cadmium levels. A cadmium TMDL was approved for Strawberry Creek in April 2010.

Two segments of Whitewood Creek near Lead are nonsupporting for *E. coli*. Sources of the high bacteria numbers in the stream's middle reach may be due to livestock, wildlife, aging septic and sewer systems, and from the combined sewer overflow in Lead. A SWD permit has been issued to the city of Lead for the combined sewer overflow, requiring compliance with EPA's nine minimum controls for the combined sewer overflow. The city

of Lead continues to make progress to separate their sewer systems and ultimately eliminate the combined sewer overflow.

An implementation project is currently on-going to address water quality of the Belle Fourche River and tributaries. The Belle Fourche River continues to remain nonsupporting for total suspended solids; however, a TMDL was approved in 2005. Fecal coliform and *E. coli* TMDLs were approved for two segments in 2011.

There are currently four coldwater rivers and streams in the Belle Fourche River basin that are on the 303(d) list for not supporting temperature water quality standards. A water temperature study, the *Black Hills Regional Stream Temperature Assessment*, has been conducted by RESPEC Consulting and Engineering of Rapid City, South Dakota. The project area includes coldwater rivers and streams in the Black Hills and encompasses portions of the Belle Fourche River and Cheyenne River basins. The project goal was to establish regionally based temperature criterion for coldwater fisheries that incorporates natural variability and duration of exposure to high temperatures in Black Hills Streams. Project objectives included: 1) identify growth and lethal temperature thresholds for coldwater fish based on literature review; 2) compile data and evaluate the current temperature regime in the Black Hills; 3) evaluate current beneficial use attainment of Black Hills streams; and 4) determine impairment of Black Hills streams based on recommended temperature criteria. DENR is working with RESPEC and EPA to incorporate the recommended information into state water quality standards. Key recommendations include definition of acute and chronic temperature criterion; incorporation of temperature duration and frequency; defining confidence levels in the percent exceedance; and establishment of ambient air temperature and low flow excursion periods.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 25: Belle Fourche River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Iron Creek Lake SD-BF-L-IRON_CREEK_01	Lawrence County	L1	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL FULL FULL	Temperature		5	YES - 2
Mirror Lake East SD-BF-L-MIRROR_EAST_01	Lawrence County	L2	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL NA NA	Temperature		5	YES - 2
Mirror Lake West SD-BF-L-MIRROR_WEST_01	Lawrence County	L3	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL NA NA	Temperature		5	YES - 2
Newell Lake SD-BF-L-NEWELL_01	Butte County	L4	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL-TH NA NA FULL	Mercury in fish tissue		5	YES - 1
Newell City Pond SD-BF-L-NEWELL_CITY_01	Butte County	L5	DENR	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL FULL FULL	Temperature		5	YES - 2
Orman Dam (Belle Fourche Reservoir) SD-BF-L-ORMAN_01	Butte County	L6	DENR BOR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL FULL			1	NO
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Annie Creek SD-BF-R-ANNIE_01	Spearfish Creek to S3, T4N, R2E	R1	DENR Wharf USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Bear Butte Creek SD-BF-R-BEAR_BUTTE_01	Headwaters to Strawberry Creek	R2	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL FULL	Temperature	Natural Sources	5	YES - 2
Bear Butte Creek SD-BF-R-BEAR_BUTTE_02	Strawberry Creek to S2, T4N, R4E	R3	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL FULL	Temperature	Natural Sources	5*	YES - 2

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Belle Fourche River SD-BF-R-BELLE_FOURCHE_01	Wyoming border to Redwater River	R4	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL NON	 Escherichia coli Fecal Coliform	 Wildlife Other than Waterfowl Livestock (Grazing or Feeding Operations)	5*	YES - 1
				Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON	 Total Suspended Solids	 Irrigated Crop Production		
Belle Fourche River SD-BF-R-BELLE_FOURCHE_02	Redwater River to Whitewood Creek	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL FULL			4A*	NO
				Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON	 Total Suspended Solids	 		
Belle Fourche River SD-BF-R-BELLE_FOURCHE_03	Whitewood Creek to Willow Creek	R6	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL FULL			4A*	NO
				Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON	 Total Suspended Solids	 Source Unknown		
Belle Fourche River SD-BF-R-BELLE_FOURCHE_04	Willow Creek to Alkali Creek	R7	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL FULL			4A*	NO
				Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON	 Total Suspended Solids	 Source Unknown		
Belle Fourche River SD-BF-R-BELLE_FOURCHE_05	Alkali Creek to mouth	R8	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL NON	 Escherichia coli Fecal Coliform	 Livestock (Grazing or Feeding Operations)	4A*	NO
				Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL NON NON	 Escherichia coli Fecal Coliform Total Suspended Solids	 Source Unknown		
Cleopatra Creek SD-BF-R-CLEOPATRA_01	Confluence with East Branch Cleopatra Creek to mouth	R9	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			1	NO
				Immersion Recreation	FULL				
				Irrigation Waters Limited Contact Recreation	FULL FULL				

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Crow Creek SD-BF-R-CROW_01_USGS	S22, T6N, R1E to Redwater River	R10	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL NA			2	NO
Deadwood Creek SD-BF-R-DEADWOOD_01	Rutabaga Gulch to Whitewood Creek	R11	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL			1	NO
False Bottom Creek SD-BF-R-FALSE_BOTTOM_01	S26, T5N, R2E to Burno Gulch Creek	R12	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Fantail Creek SD-BF-R-FANTAIL_01	Headwaters to Nevada Gulch	R13	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL			1	NO
Horse Creek SD-BF-R-HORSE_01_USGS	Indian Creek to mouth	R14	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NA FULL			2*	NO
Little Spearfish Creek SD-BF-R-LITTLE_SPEARFISH_01_USGS	S16, T4N, R1E to Spearfish Creek	R15	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL NA			2	NO
Murray Ditch SD-BF-R-MURRAY_DITCH_01_USGS	Above headgate at WY-SD state line	R16	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
Redwater River SD-BF-R-REDWATER_01	US HWY 85 to mouth	R17	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Redwater River SD-BF-R-REDWATER_01_USGS	WY border to Hwy 85	R18	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NA	Temperature	Natural Sources	5	YES - 2

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Spearfish Creek SD-BF-R-SPEARFISH_01	Intake Gulch to Annie Creek	R19	DENR USGS	Coldwater Permanent Fish Life Commerce & Industry Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL FULL			1	NO
Spearfish Creek SD-BF-R-SPEARFISH_02	Annie Creek to McKinley Gulch	R20	DENR	Coldwater Permanent Fish Life Commerce & Industry Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL FULL			1	NO
Spearfish Creek SD-BF-R-SPEARFISH_03	McKinley Gulch to Cleopatra Creek	R21	DENR USGS	Coldwater Permanent Fish Life Commerce & Industry Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL FULL			1	NO
Spearfish Creek SD-BF-R-SPEARFISH_04	Cleopatra Creek to Spearfish City intake dam in S33, T6N, R2E	R22	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Spearfish Creek SD-BF-R-SPEARFISH_05	Homestake Hydroelectric Plant at Spearfish in S15, T6N, R2E to Higgins Gulch	R23	DENR USGS	Coldwater Permanent Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL			1	NO
Spearfish Creek SD-BF-R-SPEARFISH_06	Higgens Gulch to mouth	R24	DENR	Coldwater Permanent Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL			1	NO
Stewart Gulch SD-BF-R-STEWART_01	Whitetail Creek to NW1/4, NW1/4, S7, T4N, R3E	R25	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Strawberry Creek SD-BF-R-STRAWBERRY_01	Bear Butte Creek to S5, T4N, R4E	R26	DENR	Coldwater Marginal Fish Life	FULL			4A*	NO
				Fish/Wildlife Prop, Rec, Stock	NON	Cadmium	Impacts from Abandoned Mine Lands (Inactive) Acid Mine Drainage		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
West Strawberry Creek SD-BF-R-W_STRAWBERRY_01	Headwaters to mouth	R27	DENR	Coldwater Permanent Fish Life	FULL			1*	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitetail Creek SD-BF-R-WHITETAIL_01	Whitewood Creek to S18, T4N, R3E	R28	DENR USGS	Coldwater Permanent Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek SD-BF-R-WHITEWOOD_01	Whitetail Summit to Gold Run Creek	R29	DENR	Coldwater Permanent Fish Life	FULL-TH	Temperature		5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek SD-BF-R-WHITEWOOD_02	Gold Run Creek to Deadwood Creek	R30	DENR	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek SD-BF-R-WHITEWOOD_03	Deadwood Creek to Spruce Gulch	R31	DENR	Coldwater Permanent Fish Life	FULL			4A*	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Escherichia coli			
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek SD-BF-R-WHITEWOOD_04	Spruce Gulch to Sandy Creek	R32	DENR	Coldwater Permanent Fish Life	FULL			5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Escherichia coli			
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek SD-BF-R-WHITEWOOD_05	Sandy Creek to I-90	R33	DENR USGS	Coldwater Marginal Fish Life	NON	pH (high)	Natural Sources	5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Whitewood Creek SD-BF-R-WHITEWOOD_06	I-90 to Crow Creek	R34	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL NON	 pH (high)		5	YES - 2
Whitewood Creek SD-BF-R-WHITEWOOD_07	Crow Creek to mouth	R35	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids		5	YES - 2
Willow Creek SD-BF-R-WILLOW_01_USGS	Near Vale, SD	R36	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	NA INS NA NA			3	NO

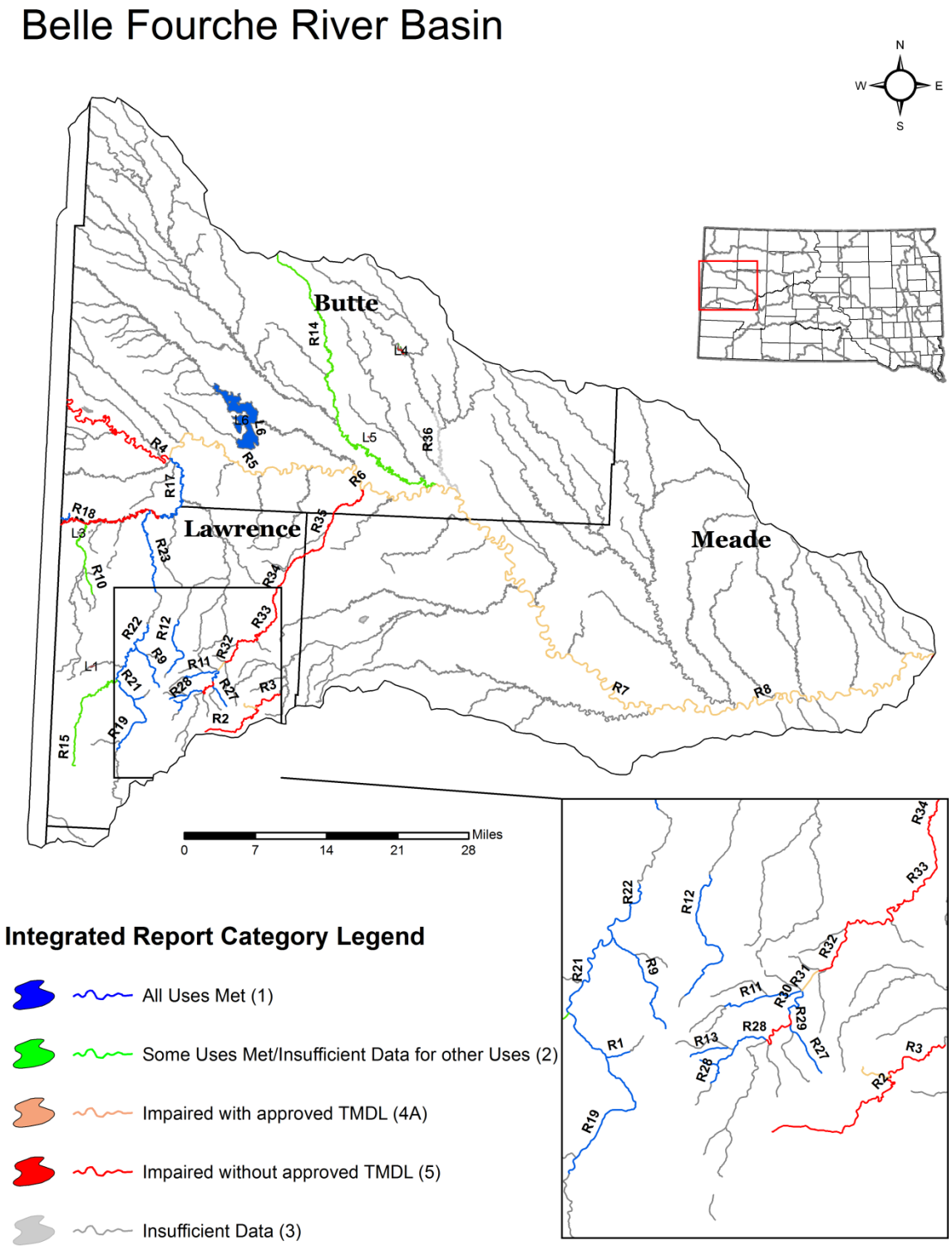


Figure 11: Belle Fourche River Basin

Big Sioux River Basin (Figure 12 and 13, Table 26)

The Big Sioux River basin is located in eastern South Dakota. The lower portion of the river forms the Iowa-South Dakota border. The basin drains an approximate 5,382 square miles in South Dakota and an additional 3,000 square miles in Minnesota and Iowa. The basin's primary source of income is agriculture, but it also contains a majority of the state's light manufacturing, food processing, and wholesale industries. Four state educational institutions, several vocational schools, and Sioux Falls, the state's largest city, are located within this basin, making this the heaviest populated basin in the state.

DENR has assessed 33 lakes and maintains 24 water quality monitoring sites within the Big Sioux basin. Seventeen water quality monitoring sites are located on the Big Sioux River. Six sampling stations were added in 2009 to the area surrounding the proposed Hyperion oil refinery location. These sites are being sampled to determine background levels of contaminants and will remain to monitor ambient water quality conditions if the oil refinery is built. In addition, available data from DENR watershed assessment projects were also used to determine waterbody support. All DENR data, including WQM, assessment projects, implementation projects, special assessments, and other DENR funded projects are all labeled as DENR as the basis in the basin tables.

The USGS has water quality monitoring sites on the Big Sioux River, Beaver Creek, Flandreau Creek, Owens Creek, Skunk Creek, Willow Creek, Hidewood Creek, and Split Rock Creek within the basin. USGS data on the Big Sioux River are fairly extensive and includes information on dissolved oxygen, pH, specific conductance, water temperature, and sodium adsorption ratio. Data collected on all USGS sites were analyzed for this report. The cities of Watertown and Sioux Falls supplied water quality data for the Big Sioux River. The city of Sioux Falls also supplied water quality data for Skunk Creek.

The main causes of nonsupport within the Big Sioux River basin are due to fecal coliform, *E. coli*, and total suspended solids. The presence of bacteria in the Big Sioux basin is mainly due to runoff from livestock operations, wet weather discharges within municipal areas, and wildlife. Sediment sources are overland runoff from nearby croplands, inflow from tributaries, and streambank erosion.

Lakes in the Big Sioux River basin are highly productive due to algae, nutrient enrichment, and siltation. Nearly 50% of the monitored lakes are considered hypereutrophic. The moderate size and shallow depth of most lakes contributes to the hypereutrophic conditions. Lakes are susceptible to rapid changes produced by large nutrient and sediment loads from sizeable agricultural watersheds comprised of nutrient-rich glacial soils.

During the 2010 reporting cycle EPA added Bullhead Lake and West Oakwood to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

Blue Dog Lake was listed for both recreation beneficial uses due to bacteria (*E. coli*) during the 2010 listing cycle. During the impairment analysis process for the 2012 cycle it was determined that the 2010 listing was made in error. As a result, Blue Dog was delisted for *E. coli* for the 2012 cycle. The support status was changed to category 3 (insufficient data)

as no bacteria data were available within the most recent 10 year period in accordance with the 2012 Integrated Report listing methodology. DENR plans to sample Blue Dog for *E. coli* during the recreation season of 2012 and 2013. Information acquired will be used to evaluate recreation use support and impairment status for the 2014 listing cycle. Blue Dog remains in nonsupport for the warmwater permanent fish life use and on the 303(d) list for pH for the 2012 cycle. The pH data available for Blue Dog Lake are considered insufficient though a change in support and 303(d) listing status cannot be made until additional pH data are obtained. The most recent pH data available for Blue Dog were collected in 2004 and no exceedances of the standard were observed.

Watershed management programs are attempting to reduce bacteria, sediment and nutrient loads from both manmade and natural sources within the basin. On-going watershed implementation projects include Lake Poinsett, and the upper, north central, central, and lower Big Sioux River.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 26: Big Sioux River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Lake Albert SD-BS-L-ALBERT_01	Kingsbury County	L1	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Lake Alvin SD-BS-L-ALVIN_01	Lincoln County	L2	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL NON	 Temperature		5*	YES - 2
Bitter Lake SD-BS-L-BITTER_01	Day County	L3	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL-TH FULL FULL FULL	Mercury in fish tissue 	Non-Point Source 	5	YES - 1
Blue Dog Lake SD-BS-L-BLUE_DOG_01	Day County	L4	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	INS INS INS NON	 pH (high)		5*	YES - 2
Brant Lake SD-BS-L-BRANT_01	Lake County	L5	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL	 		1*	NO
Bullhead Lake SD-BS-L-BULLHEAD_01	Deuel County	L6	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Source Unknown 	5	YES - 2
Lake Campbell SD-BS-L-CAMPBELL_01	Brookings County	L7	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL	 		1	NO
Clear Lake SD-BS-L-CLEAR_D_01	Deuel County	L8	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL	 		1*	NO
Covell Lake SD-BS-L-COVELL_01	Minnehaha County	L9	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL NA NA FULL	 		2	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Dry Lake SD-BS-L-DRY_01	Codington County	L10	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
East Oakwood Lake SD-BS-L-E_OAKWOOD_01	Brookings County	L11	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2
Enemy Swim Lake SD-BS-L-ENEMY_SWIM_01	Day County	L12	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
Goldsmith Lake SD-BS-L-GOLDSMITH_01	Brookings County	L13	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Lake Herman SD-BS-L-HERMAN_01	Lake County	L14	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
North Island Lake SD-BS-L-ISLAND_N_01	Minnehaha/McCook counties (formerly SD-VM-L-ISLAND_N_01)	L15	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation NA Warmwater Semipermanent Fish Life	NA NA INS-TH	 Mercury in fish tissue	 Non-Point Source	5	YES - 1
Lake Kampeska SD-BS-L-KAMPESKA_01	Codington County	L16	DENR	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL FULL			1*	NO
Lake Madison SD-BS-L-MADISON_01	Lake County	L17	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1*	NO
Lake Marsh SD-BS-L-MARSH_01	Hamlin County	L18	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Minnewasta Lake SD-BS-L-MINNEWASTA_01	Day County	L19	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Lake Norden SD-BS-L-NORDEN_01	Hamlin County	L20	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Opitz Lake SD-BS-L-OPITZ_01	Day County	L21	DENR	Fish/Wildlife Prop, Rec, Stock	INS – TH	Mercury in fish tissue	Non-Point Source	5	YES - 1
Pelican Lake SD-BS-L-PELICAN_01	Codington County	L22	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2
Pickerel Lake SD-BS-L-PICKEREL_01	Day County	L23	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
Lake Poinsett SD-BS-L-POINSETT_01	Hamlin County	L24	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
Reid Lake SD-BS-L-REID_01	Clark County	L25	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS-TH NA NA NA	Mercury in fish tissue		5	YES - 1
School Lake SD-BS-L-SCHOOL_01	Deuel County	L26	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1*	NO
Lake Sinai SD-BS-L-SINAI_01	Brookings County	L27	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	INS NA NA INS			3	NO
Lake St. John SD-BS-L-ST_JOHN_01	Hamlin County	L28	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Twin Lakes/W. Hwy 81 SD-BS-L-TWIN_01	Kingsbury County	L29	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue	Non-Point Source	5	YES - 1
Twin Lakes SD-BS-L-TWIN_02	Minnehaha County	L30	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	INS-TH NA NA NA	Mercury in fish tissue	Non-Point Source	5	YES - 1
West Oakwood Lake SD-BS-L-W_OAKWOOD_01	Brookings County	L31	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
Wall Lake SD-BS-L-WALL_01	Minnehaha County	L32	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Waubay Lake SD-BS-L-WAUBAY_01	Day County	L33	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Beaver Creek SD-BS-R-BEAVER_01	Big Sioux River to S9, T98N, R49W	R1	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	INS INS NON INS	Fecal Coliform	Livestock (Grazing or Feeding Operations)	4A*	NO
Beaver Creek SD-BS-R-BEAVER_02	Split Rock Creek to South Dakota-Minnesota border	R2	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL NON FULL	Fecal Coliform	Livestock (Grazing or Feeding Operations)	4A*	NO
Big Ditch Creek SD-BS-R-BIG_DITCH_01	headwaters to S21, T92N, R50W	R3	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Unnamed tributary to Big Ditch Creek SD-BS-R-BIG_DITCH_TRIB_01	headwaters to Big Ditch Creek	R4	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Big Sioux River SD-BS-R-BIG_SIOUX_01	S28, T121N, R52W to Lake Kampeska	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON NON	Escherichia coli Oxygen, Dissolved Oxygen, Dissolved		5	YES - 1

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Big Sioux River	Lake Kampeska to Willow Creek	R6	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
SD-BS-R-BIG_SIOUX_02		City of Watertown							
				Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL				
Big Sioux River	Willow Creek to Stray Horse Creek	R7	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			4A*	NO
SD-BS-R-BIG_SIOUX_03									
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	FULL				
Big Sioux River	Stray Horse Creek to near Volga	R8	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
SD-BS-R-BIG_SIOUX_04									
				Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL				
Big Sioux River	Near Volga to Brookings	R9	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
SD-BS-R-BIG_SIOUX_05									
Big Sioux River	Brookings to Brookings/Moody County Line	R10	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
				Limited Contact Recreation	FULL				
SD-BS-R-BIG_SIOUX_06				Warmwater Semipermanent Fish Life	FULL				
Big Sioux River	Brookings/Moody County	R11	DENR	Domestic Water Supply	FULL			1*	NO
SD-BS-R-BIG_SIOUX_07	Line to S2, T104N, R49W		USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL				
Big Sioux River	S2, T104N, R49W to I-90	R12	DENR	Domestic Water Supply	FULL			5*	YES - 1
SD-BS-R-BIG_SIOUX_08		City of Sioux Falls	USGS	Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Escherichia coli Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters Limited Contact Recreation	FULL FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Big Sioux River	I-90 to diversion return	R13	DENR	Domestic Water Supply	FULL			5	YES - 1
SD-BS-R-BIG_SIOUX_10			USGS	Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Residential Districts		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Big Sioux River	Diversion return to SF WWTF	R14	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
			USGS	Immersion Recreation	NON	Escherichia coli			
SD-BS-R-BIG_SIOUX_11		City of Sioux Falls							
						Fecal Coliform	Municipal (Urbanized High Density Area)		
							Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Big Sioux River	SF WWTF to above Brandon	R15	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
SD-BS-R-BIG_SIOUX_12		City of Sioux Falls		Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Big Sioux River	Above Brandon to Nine Mile Creek	R16	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
SD-BS-R-BIG_SIOUX_13				Immersion Recreation	NON	Escherichia coli	Grazing in Riparian or Shoreline Zones		
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Big Sioux River	Nine Mile Creek to near Fairview	R17	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
SD-BS-R-BIG_SIOUX_14				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Big Sioux River	Fairview to near Alcester	R18	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BS-R-BIG_SIOUX_15				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Grazing in Riparian or Shoreline Zones		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Crop Production (Crop Land or Dry Land)		

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Big Sioux River	Near Alcester to Indian Creek	R19	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BS-R-BIG_SIOUX_16				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
							Grazing in Riparian or Shoreline Zones		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Streambank Modifications/destabilization		
							Non-irrigated Crop Production		
							Crop Production (Crop Land or Dry Land)		
Big Sioux River	Indian Creek to mouth	R20	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BS-R-BIG_SIOUX_17				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
							Grazing in Riparian or Shoreline Zones		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL-TH	Escherichia coli			
						Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Streambank Modifications/destabilization		
							Grazing in Riparian or Shoreline Zones		
							Crop Production (Crop Land or Dry Land)		
Brule Creek	Big Sioux River to confluence of its east and west forks	R21	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
SD-BS-R-BRULE_01				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
East Brule Creek	confluence with Brule Creek to S3, T95N, R49W	R22	DENR	Fish/Wildlife Prop, Rec, Stock	INS			5*	YES - 1
SD-BS-R-EAST_BRULE_01				Irrigation Waters	INS				
				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	NON	Total Suspended Solids			
Flandreau Creek	Big Sioux River to Minnesota Border	R23	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
SD-BS-R-FLANDREAU_01				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Hidewood Creek	Big Sioux River to U.S. Highway 77	R24	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BS-R-HIDEWOOD_01				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	FULL				

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WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Jack Moore Creek SD-BS-R-JACK_MOORE_01	Big Sioux River to S33, T107N, R49W	R25	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
North Deer Creek SD-BS-R-NORTH_DEER_01	Six Mile Creek to U.S. Highway 77	R26	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Owens Creek (Blue Dog Lake inflow) SD-BS-R-OWENS_01_USGS	S18, T122N, R52W to Blue Dog Lake	R27	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
				Warmwater Permanent Fish Life	INS				
Pattee Creek SD-BS-R-PATTEE_01	Big Sioux River to Lake Lakota	R28	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
				Warmwater Semipermanent Fish Life	NA				
Peg Munky Run SD-BS-R-PEG_MUNKY_RUN_01	Big Sioux River to S17, T113N, R50W	R29	DENR	Fish/Wildlife Prop, Rec, Stock	INS			4A*	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	INS				
Pipestone Creek SD-BS-R-PIPESTONE_01	Split Rock Creek to Minnesota border	R30	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Six Mile Creek SD-BS-R-SIXMILE_01	Big Sioux River to S30, T112N, R48W	R31	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Fecal Coliform			
				Warmwater Marginal Fish Life	FULL				
Skunk Creek SD-BS-R-SKUNK_01	Brandt Lake to Big Sioux River	R32	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Fecal Coliform			
				Warmwater Marginal Fish Life	NON	Total Suspended Solids			

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Split Rock Creek SD-BS-R-SPLIT_ROCK_01_USGS	At Corson, SD	R33	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)	4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL	Fecal Coliform			
				Warmwater Semipermanent Fish Life	FULL				
Spring Creek SD-BS-R-SPRING_01	Big Sioux River to S22, T109, R47W	R34	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			4A*	NO
				Limited Contact Recreation	FULL-TH	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	FULL				
Stray Horse Creek SD-BS-R-STRAYHORSE_01	Big Sioux River to S26, T116N, R51W	R35	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			4A*	NO
				Limited Contact Recreation	INS	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	INS				
Union Creek SD-BS-R-UNION_01	Big Sioux River to confluence with East and West Forks	R36	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			5*	YES - 2
				Limited Contact Recreation	INS-TH	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	INS-TH	Total Suspended Solids			
Willow Creek SD-BS-R-WILLOW_01	Big Sioux River to S7, T117N, R50W	R37	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			4A*	NO
				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	INS				

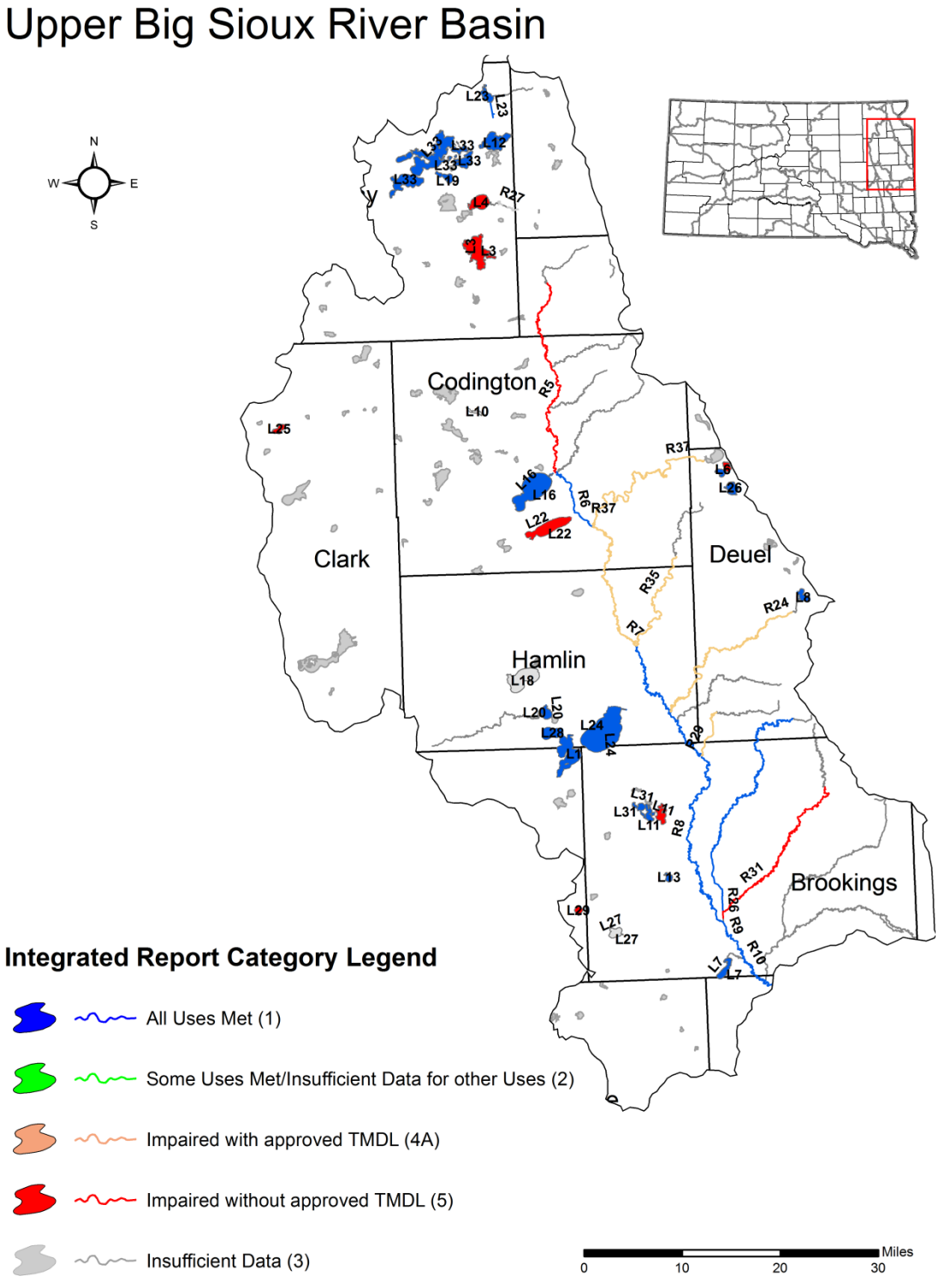

Figure 12: Upper Big Sioux River Basin

Lower Big Sioux River Basin

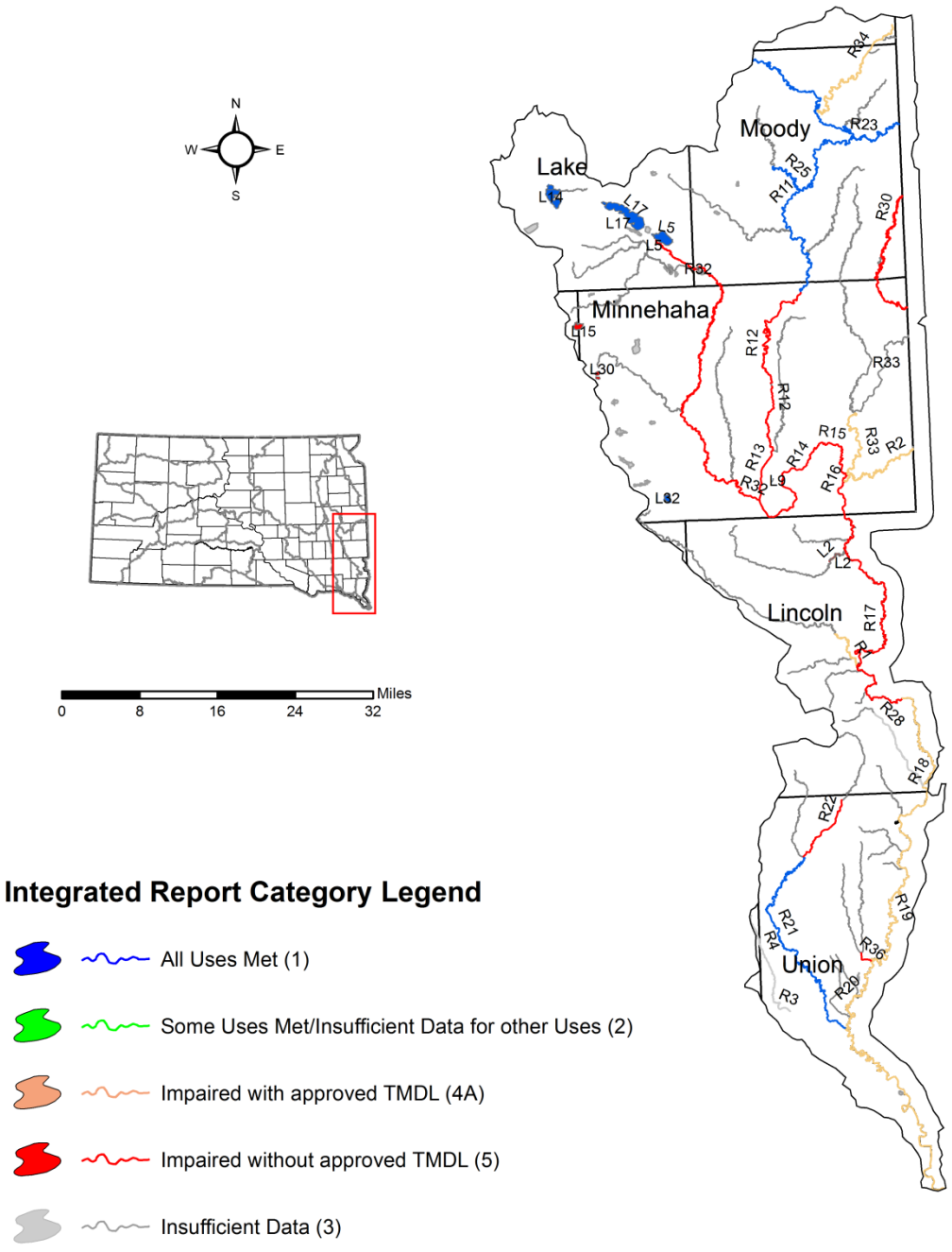

Figure 13: Lower Big Sioux River Basin

Cheyenne River Basin (Figures 14 and 15, Table 27)

The portion of the Cheyenne River basin that lies in southwestern South Dakota drains about 9,732 square miles within the boundaries of the state. The area in this basin is very diverse. It includes part of the Black Hills and Badlands, rangeland, irrigated cropland, and some mining areas. The Cheyenne River originates in Wyoming, flows through the southern Black Hills, and enters Lake Oahe near the center of the state.

DENR has assessed 17 lakes and maintains 29 water quality monitoring sites within the Cheyenne basin. Eight monitoring sites are located on the Cheyenne River, three are located on French Creek, and five are located on Rapid Creek. The other sites are located on various other streams in the basin. In addition, available data from DENR watershed assessment projects were also used to determine waterbody support. All DENR data, including WQM, assessment projects, implementation projects, special assessments, and other DENR funded projects, are all labeled as DENR as the basis in the basin tables.

The USGS also maintains a number of water quality monitoring sites located along streams in the Cheyenne River Basin including: Battle Creek, Bear Gulch, Hat Creek, Highland Creek, Rapid Creek, Sunday Gulch, Cheyenne River, and others. The USGS data are limited for most sites and mostly includes specific conductance and water temperature information. Data collected on all USGS sites were analyzed for this report. BOR submitted water quality information for Angostura Reservoir, Deerfield Reservoir, and Pactola Reservoir.

The Cheyenne River basin is home to deposits of natural uranium and historic uranium mining activities. With the increasing price of uranium compounded with rising energy needs, uranium exploration drilling has resumed. DENR maintains five water quality monitoring locations within the basin to monitor for uranium and other associated parameters. For this 2012 reporting cycle, there are no surface water quality exceedances for any parameters associated with past uranium mining or current explorations.

The Cheyenne River water quality continues to be generally poor due to both natural and agricultural sources. The lower Cheyenne drainage, in general, contains highly erodible soils. The landscape contributes considerable amounts of eroded sediment during periods of heavy rainfall. Segments downstream of the Fall River remain nonsupporting for fecal coliform and/or *E.coli* bacteria; however these segments have approved TMDLs.

Water quality in Rapid Creek for reaches above Rapid City meets water quality standards for designated beneficial uses. Rapid Creek segments from Canyon Lake to the Cheyenne River continue to display poor water quality due to excessive fecal coliform and/or *E. coli* bacteria levels. Bacteria TMDLs for these lower reaches were approved in 2010.

The Black Hills region traditionally has some of the best surface water quality in the state. This is due in a large part to a cooler climate and higher precipitation than the surrounding plains as a result of greater elevation and forest cover. Also contributing to the water quality in this region are the local bedrock formations which are much less erodible than the highly erosive and leachable marine shales and badlands on the surrounding plains. However, the Black Hills streams are vulnerable to losses of flow exacerbated by periodic droughts. In addition, high summer ambient air temperature causes elevated water temperature and results in temperature impairments for coldwater fisheries. Grazing of

streamside vegetation, which increases stream bank erosion, water temperature, and nutrient loading, also continues to be a problem in some streams in this area.

There are currently twelve coldwater rivers and streams in the Cheyenne River basin that are on the 303(d) list for not supporting temperature water quality standards. The *Black Hills Regional Stream Temperature Assessment* conducted by RESPEC will be used to re-evaluate the current beneficial use attainment and to determine future impairments based on recommended temperature standards.

The Lower Cheyenne River Assessment project and the French Creek Assessment project were both completed during this reporting period. No other assessment projects are currently ongoing in the Cheyenne River basin. The Spring Creek Implementation Project is the only implementation project being conducted in the Cheyenne River basin.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 27: Cheyenne River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Angostura Reservoir SD-CH-L-ANGOSTURA_01	Fall River County	L1	DENR BOR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL FULL			1	NO
Bismark Lake SD-CH-L-BISMARK_01	Custer County	L2	DENR	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Canyon Lake SD-CH-L-CANYON_01	Pennington County	L3	DENR	Coldwater Permanent Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	FULL FULL FULL FULL FULL			1	NO
Center Lake SD-CH-L-CENTER_01	Custer County	L4	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL FULL FULL	pH (high) Temperature		5*	YES - 2
Cold Brook Reservoir SD-CH-L-COLD_BROOK_01	Fall River County	L5	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL INS INS	Temperature	Natural Sources	5	YES - 2
Cottonwood Springs Lake SD-CH-L-COTTONWOOD_SPRINGS_01	Fall River County	L6	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
Crow Reservoir SD-CH-L-CROW_01	Fall River County	L7	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	INS INS INS INS			3	NO
Curlew Lake SD-CH-L-CURLEW_01	Meade County	L8	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NA NA FULL			2	NO
Deerfield Lake SD-CH-L-DEERFIELD_01	Pennington County	L9	DENR BOR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL NA NA	Temperature		5	YES - 2

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Horsethief Lake SD-CH-L-HORSETHIEF_01	Pennington County	L10	DENR	Coldwater Permanent Fish Life	NON	pH (high) Temperature	Natural Sources	5*	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
Lakota Lake SD-CH-L-LAKOTA_01	Custer County	L11	DENR	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
Legion Lake SD-CH-L-LEGION_01	Custer County	L12	DENR	Coldwater Marginal Fish Life	NON	pH (high)		4A*	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
New Wall Lake SD-CH-L-NEW_WALL_01	Pennington County	L13	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	NA				
				Limited Contact Recreation	NA				
				Warmwater Permanent Fish Life	NON	pH (high)			
Pactola Reservoir SD-CH-L-PACTOLA_01	Pennington County	L14	DENR BOR	Coldwater Permanent Fish Life	FULL			1	NO
				Domestic Water Supply	FULL				
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Sheridan Lake SD-CH-L-SHERIDAN_01	Pennington County	L15	DENR	Coldwater Permanent Fish Life	NON	Oxygen, Dissolved Temperature	Natural Sources	5*	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
Stockade Lake SD-CH-L-STOCKADE_01	Custer County	L16	DENR	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
Sylvan Lake SD-CH-L-SYLVAN_01	Custer County	L17	DENR	Coldwater Permanent Fish Life	NON	Temperature	Natural Sources	5*	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Battle Creek SD-CH-R-BATTLE_01	Near Horsethief Lake to Teepee Gulch Creek	R1	DENR USGS	Coldwater Permanent Fish Life	NON	Temperature	Natural Sources	5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				

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WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Battle Creek SD-CH-R-BATTLE_01_USGS	Hwy 79 to mouth	R2	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL NON FULL-TH	 Escherichia coli Fecal Coliform Total Suspended Solids		5	YES - 1
Battle Creek SD-CH-R-BATTLE_02	Teepee Gulch Creek to SD HWY 79	R3	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NON	Temperature Escherichia coli Fecal Coliform	Natural Sources	5	YES - 1
Bear Gulch SD-CH-R-BEAR_GULCH_01_USGS	Near Hayward, SD	R4	USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	INS INS INS NA	 		3	NO
Beaver Creek SD-CH-R-BEAVER_01	WY border to Cheyenne River	R5	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	NON NON FULL NON	Specific Conductance Total Dissolved Solids Salinity Specific Conductance 		5*	YES - 1
Beaver Creek SD-CH-R-BEAVER_01_USGS	Near Buffalo Gap	R6	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON FULL	 Fecal Coliform 		5	YES - 2
Beaver Creek SD-CH-R-BEAVER_02_USGS	S13, T5N, R4E to SD Hwy 79	R7	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NA	Temperature 		5	YES - 2
Box Elder Creek SD-CH-R-BOX_ELDER_01	Cheyenne River to S22, T2N, R8E	R8	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL	 		1	NO
Box Elder Creek SD-CH-R-BOX_ELDER_02	S16, T2N, R6E to S14, T3N, R4E	R9	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL	 		1	NO

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WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Castle Creek	Deerfield Reservoir to Rapid Creek	R10	DENR USGS	Coldwater Permanent Fish Life	FULL			1	NO
SD-CH-R-CASTLE_01				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Cherry Creek	Cheyenne River to Sulphur Creek	R11	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
SD-CH-R-CHERRY_01				Irrigation Waters	FULL				
				Limited Contact Recreation	INS				
				Warmwater Marginal Fish Life	FULL				
Cheyenne River	WY border to Beaver Creek	R12	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
SD-CH-R-CHEYENNE_01				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Cheyenne River	Beaver Creek to Cascade Creek	R13	DENR USGS	Fish/Wildlife Prop, Rec, Stock	NON	Specific Conductance		5	YES - 1
SD-CH-R-CHEYENNE_02						Total Dissolved Solids	Natural Sources		
							Livestock (Grazing or Feeding Operations)		
							Crop Production (Crop Land or Dry Land)		
				Irrigation Waters	NON	Salinity			
						Specific Conductance	Natural Sources		
							Livestock (Grazing or Feeding Operations)		
							Crop Production (Crop Land or Dry Land)		
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Cheyenne River	Cascade Creek to Angostura Reservoir	R14	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
SD-CH-R-CHEYENNE_02B				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Cheyenne River	Fall River to Cedar Creek	R15	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
SD-CH-R-CHEYENNE_03				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform			
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Natural Sources		
							Irrigated Crop Production		
							Grazing in Riparian or Shoreline Zones		

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Cheyenne River SD-CH-R-CHEYENNE_04	Cedar Creek to Belle Fourche River	R16	DENR USGS	Fish/Wildlife Prop, Rec, Stock	NON	Alkalinity (CaCO3) Total Dissolved Solids		5*	YES - 1
				Immersion Recreation	NON	Escherichia coli Fecal Coliform	Wildlife Other than Waterfowl Natural Sources Livestock (Grazing or Feeding Operations) Crop Production (Crop Land or Dry Land)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Rangeland Grazing Natural Sources Crop Production (Crop Land or Dry Land)		
Cheyenne River SD-CH-R-CHEYENNE_05	Belle Fourche River to Bull Creek	R17	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Wildlife Other than Waterfowl Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform			
				Warmwater Permanent Fish Life	NON	Total Suspended Solids	Irrigated Crop Production		
Cheyenne River SD-CH-R-CHEYENNE_06	Bull Creek to Lake Oahe	R18	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Wildlife Other than Waterfowl Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform	Wildlife Other than Waterfowl		
				Warmwater Permanent Fish Life	NON	Total Suspended Solids			
Cold Springs Creek SD-CH-R-COLD_SPRING_01_USGS	0.1 mile west of park boundary on Hwy 385	R19	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Elk Creek SD-CH-R-ELK_01_USGS	S9, T3N, R7E to S27, T4N, R3E	R20	USGS	Coldwater Permanent Fish Life	FULL-TH	Temperature		5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NA				
				Irrigation Waters	FULL				
				Limited Contact Recreation	NA				
Elm Creek SD-CH-R-ELM_01_USGS	Near Fairpoint, Red Owl, SD	R21	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Fall River SD-CH-R-FALL_01	Hot Springs to mouth	R22	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL NON	 Temperature	 Natural Sources	5	YES - 2
Flynn Creek SD-CH-R-FLYNN_01	SF Lame Johnny Creek to S23, T4S, R5E	R23	DENR	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
French Creek SD-CH-R-FRENCH_01	S23, T3S, R3E to Custer	R24	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
French Creek SD-CH-R-FRENCH_02	Custer to Stockade Lake	R25	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
French Creek SD-CH-R-FRENCH_03	Stockade Lake to SD HWY 79	R26	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Grace Coolidge Creek SD-CH-R-GRACE_COOLIDGE_01	S12, T3S, R5E to Battle Creek	R27	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL FULL	Temperature	Drought-related	5	YES - 2
Grizzly Bear Creek SD-CH-R-GRIZZLY_BEAR_01_USGS	Near Keystone, SD	R28	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NA	Temperature		5	YES - 2
Hat Creek SD-CH-R-HAT_01_USGS	Near Edgemont, SD	R29	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL INS FULL			2	NO
Highland Creek SD-CH-R-HIGHLAND_01_USGS	Wind Cave Natl Park near Pringle, SD	R30	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	INS-TH INS INS INS	pH (high) Temperature	Natural Sources	5	YES - 2

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Horsehead Creek SD-CH-R-HORSEHEAD_01_USGS	At Oelrichs	R31	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	INS INS INS INS			3	NO
Hot Brook Creek SD-CH-R-HOT_BROOK_01	Fall River to S19, T7S, R5E	R32	DENR	Coldwater Marginal Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Irrigation Waters	NON NA NA NA	Temperature	Natural Sources	5	YES - 2
Lime Creek SD-CH-R-LIME_01_USGS	At Rapid City, SD	R33	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NA NA NA NA			3	NO
Lindsey Draw SD-CH-R-LINDSEY_DRAW_01_USGS	Near Farmingdale, SD	R34	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Pass Creek SD-CH-R-PASS_01_USGS	Near Dewey, SD	R35	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Rapid Creek SD-CH-R-RAPID_01	Headwaters to Pactola Reservoir	R36	DENR USGS	Coldwater Permanent Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL			1	NO
Rapid Creek SD-CH-R-RAPID_02	Pactola Reservoir to Canyon Lake	R37	DENR USGS	Coldwater Permanent Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL FULL FULL			1	NO
Rapid Creek SD-CH-R-RAPID_03	Canyon Lake to S15, T1N, R8E	R38	DENR USGS	Coldwater Permanent Fish Life Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation	NON FULL FULL NON FULL FULL	Temperature Fecal Coliform	 Urban runoff/storm sewers On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) Livestock (Grazing or Feeding Operations) Crop Production (Crop Land or Dry Land)	5*	YES - 1

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Rapid Creek SD-CH-R-RAPID_04	S15, T1N, R8E to above Farmingdale	R39	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL NON	Fecal Coliform	On-site Treatment Systems (Septic Systems and Similar Decentralized Systems)	4A*	NO
				Irrigation Waters	FULL		Livestock (Grazing or Feeding Operations)		
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Rapid Creek SD-CH-R-RAPID_05	Above Farmingdale to Cheyenne River	R40	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL NON	Escherichia coli Fecal Coliform	Livestock (Grazing or Feeding Operations)	4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Fecal Coliform			
				Warmwater Permanent Fish Life	NON	Total Suspended Solids			
North Fork Rapid Creek SD-CH-R-RAPID_N_FORK_01	From confluence with Rapid Creek to S8, T3N, R3E	R41	DENR	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS-TH INS NA	Temperature		5	YES - 1
				Limited Contact Recreation	INS				
Reno Gulch SD-CH-R-RENO_GULCH_01_USGS	Near Hill City, SD	R42	USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL NA			2	NO
Rhoads Fork SD-CH-R-RHOADS_FORK_01_USGS	Near Rochford, SD	R43	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL NA			2	NO
Spring Creek SD-CH-R-SPRING_01	S5, T2S, R3E to Sheridan Lake	R44	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation	NON FULL NON	Temperature Fecal Coliform	Natural Sources Wildlife Other than Waterfowl Urban Runoff/Storm Sewers On-site Treatment Systems (Septic Systems and Similar Decentralized Systems) Livestock (Grazing or Feeding Operations)	5*	YES - 2
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Spring Creek SD-CH-R-SPRING_02	Sheridan Lake to SD HWY 79	R45	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			1	NO
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Sunday Gulch SD-CH-R-SUNDAY_GULCH_01_USGS	S18, T2S, T5E to headwaters	R46	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Victoria Creek SD-CH-R-VICTORIA_01_USGS	Rapid Creek to S19, T1N, R6E	R47	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NA	Temperature	Natural Sources	5	YES - 2

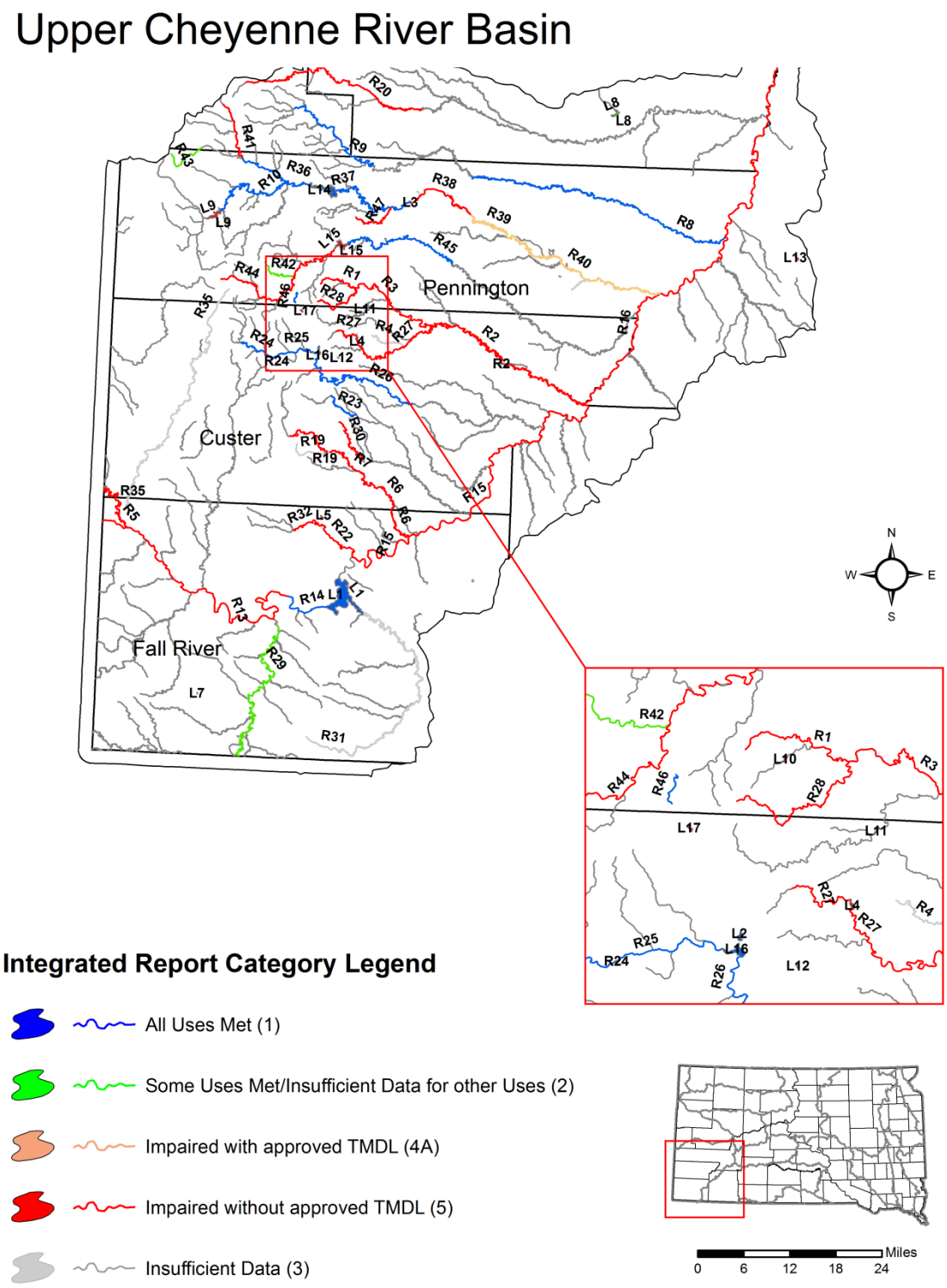


Figure 14: Upper Cheyenne River Basin

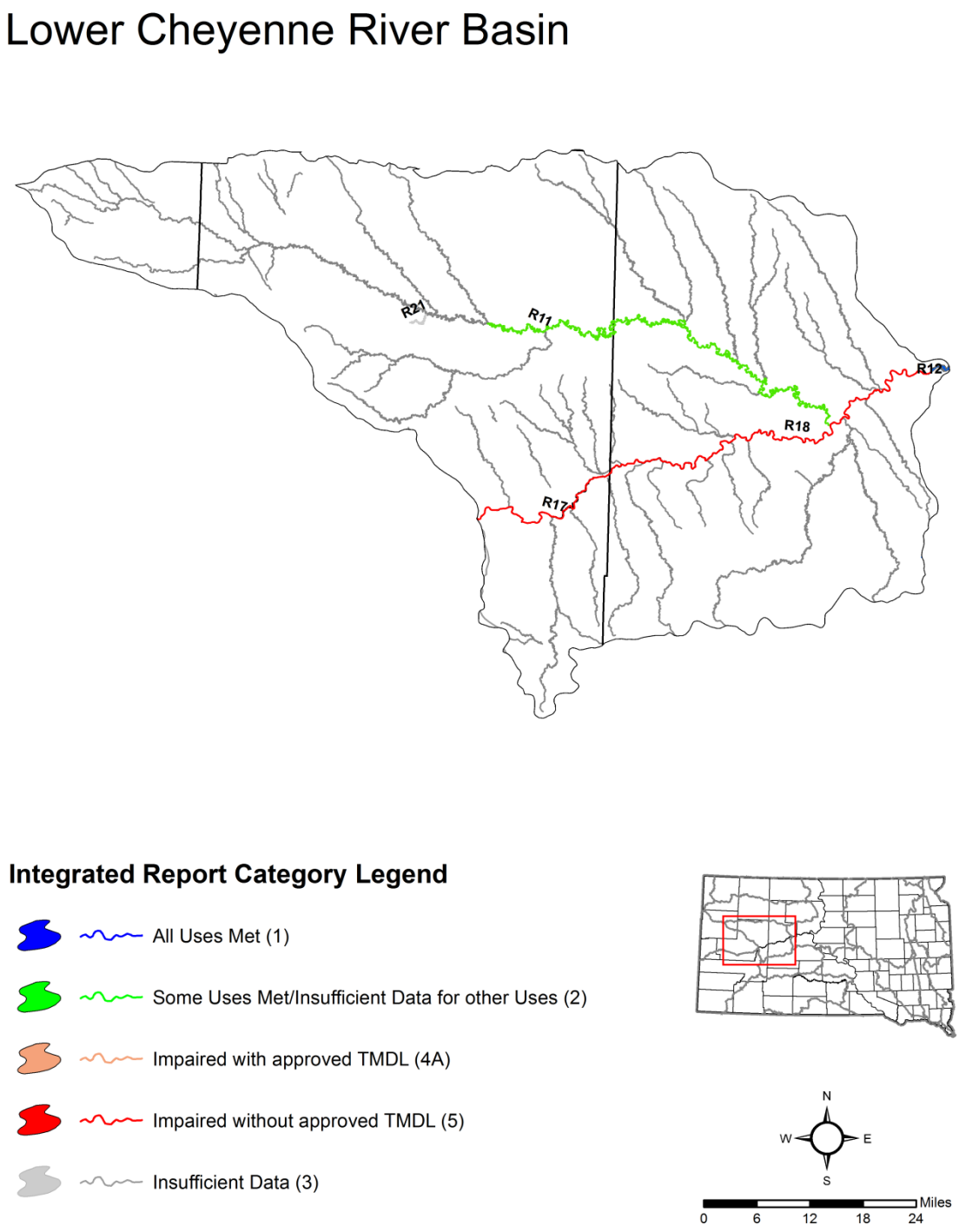


Figure 15: Lower Cheyenne River Basin

Grand River Basin (Figure 16, Table 28)

The Grand River basin covers 4,596 square miles in northwest South Dakota and southwest North Dakota. This is a sparsely populated region with a population density of approximately one person per square mile. The major income is derived from agriculture; however, this basin possesses energy resources in commercial quantities.

DENR has assessed five lakes and maintains nine water quality monitoring sites within the Grand River basin.

The USGS data are limited in the Grand River basin; however, USGS data were used for segments of the Grand River, South Fork Grand River, and North Fork Grand River. BOR submitted water quality data for Shadehill Reservoir.

Due to historic uranium mining in the Grand River basin, DENR maintains four water quality monitoring sites that are monitored for uranium and other associated parameters. For this reporting cycle, there are no surface water quality exceedances for uranium or other parameters associated with uranium mining.

Elevated specific conductance, pH, TSS, and sodium adsorption ratios (SAR) are typical of the entire basin. The North Fork watershed drains the southern periphery of the North Dakota badlands which may be a major source of high levels of specific conductance and SAR. The South Fork drainage contains erosive soils, which contribute sediment and suspended solids that often produce high TSS, pH, and SAR levels in the South Fork.

Shadehill Reservoir and the Grand River are considered impaired for irrigation use due to natural limitations imposed by local soil-water incompatibility. High sodium concentration, combined with the clay characteristics of most soils in this region, significantly reduce the acreages suitable for continuous irrigation. This condition is measured by the sodium adsorption ratio (SAR). A SAR value of 10 or greater indicates that a buildup of sodium will break down soil structure and cause serious problems for plant growth.

During the 2010 reporting cycle EPA added Lake Isabel to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

There are no on-going assessment or implementation projects occurring within the basin at this time.

DENR has referred TMDL development for all waterbodies in the Grand River basin to EPA. Therefore, TMDL priority and schedule have not been populated in the basin table. DENR is currently in discussions with EPA to determine next steps regarding TMDL development and prioritization for the Grand River Basin.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 28: Grand River Basin Information

WATERBODY Lake/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Flat Creek Dam SD-GR-L-FLAT_CREEK_01	Perkins County	L1	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Lake Gardner SD-GR-L-GARDNER_01	Harding County	L2	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NA NA FULL			2	NO
Lake Isabel SD-GR-L-ISABEL_01	Dewey County	L3	DENR	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL-TH NON NON NON	 Mercury in fish tissue Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Non-Point Source Source Unknown	5	YES-D**
Pudwell Dam SD-GR-L-PUDWELL_01	Corson County	L4	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	INS-TH NA NA NA	Mercury in fish tissue	Non-Point Source	5	YES-D**
Shadehill Reservoir SD-GR-L-SHADEHILL_01	Perkins County	L5	DENR BOR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON FULL FULL	 Salinity 	 Natural Sources 	5	YES-D**
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Bull Creek SD-GR-R-BULL_01	SF Grand River to S15, T21N, R5E	R1	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL-TH INS FULL	 Salinity	 Natural Sources	5	YES-D**
Crooked Creek SD-GR-R-CROOKED_01	ND border to S34, T23N, R5E	R2	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL-TH INS FULL	 Salinity	 Natural Sources	5	YES-D**
Grand River SD-GR-R-GRAND_01	Shadehill Reservoir to Corson County line	R3	DENR	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL-TH FULL	Temperature Salinity 	Natural Sources Natural Sources 	5	YES-D**

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Grand River SD-GR-R-GRAND_02	Corson County line to Bullhead	R4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	FULL-TH	Salinity	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Total Suspended Solids			
Grand River SD-GR-R-GRAND_03	Bullhead to mouth	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	FULL-TH	Salinity	Natural Sources		
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Permanent Fish Life	NON	Total Suspended Solids	Natural Sources		
							Grazing in Riparian or Shoreline Zones		
Grand River, North Fork SD-GR-R-GRAND_N_FORK_01	North Dakota border to Shadehill Reservoir	R6	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	NON	Salinity	Natural Sources		
						Specific Conductance	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Grand River, South Fork SD-GR-R-GRAND_S_FORK_01	Jerry Creek to Skull Creek	R7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	NON	Salinity	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Natural Sources		
							Grazing in Riparian or Shoreline Zones		
							Crop Production (Crop Land or Dry Land)		
Grand River, South Fork SD-GR-R-GRAND_S_FORK_02	Skull Creek to Shadehill Reservoir	R8	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	NON	Salinity	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Natural Sources		
							Grazing in Riparian or Shoreline Zones		
							Crop Production (Crop Land or Dry Land)		

Grand River Basin

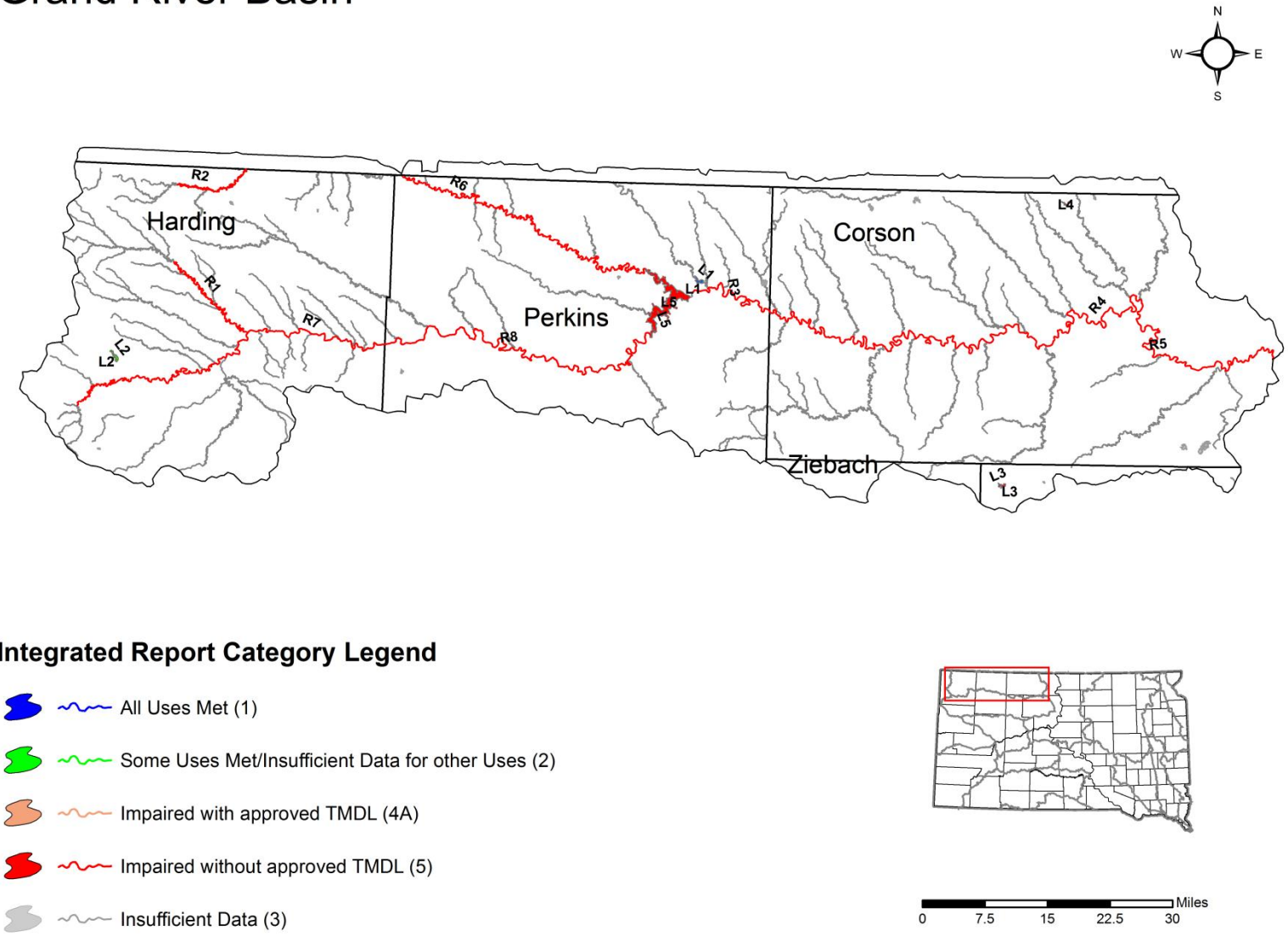


Figure 16: Grand River Basin

James River Basin (Figures 17 and 18, Table 29)

The James River drainage is the second largest river basin in the state. It drains approximately 14,729 square miles, stretching from the North Dakota border to the Missouri River near the Nebraska border. It is located in east-central South Dakota. Agriculture and related businesses are the predominant sources of income.

DENR has assessed 34 lakes and maintains 21 water quality monitoring sites within the James basin. Eleven monitoring sites are located on the James River. The other sites are located on various other streams in the basin. In addition, available data from DENR watershed assessment projects were also used to determine waterbody support. All DENR data, including WQM, assessment projects, implementation projects, special assessments, and other DENR funded projects, are all labeled as DENR as the basis in the basin tables.

The USGS has several water quality monitoring sites on the James River and other streams in the James River basin including: Elm River, Firesteel Creek, Moccasin Creek, Turtle Creek, Wolf Creek, Foot Creek, Rock Creek, and several unnamed tributaries in the basin. However, the data are very limited, and for most sites the only parameters that were measured were specific conductance and water temperature.

Dissolved oxygen (DO), high pH, TSS, and bacteria were the main impairments observed within the James River basin during this reporting cycle. Past reporting cycles have also identified these causes of impairment within the James River basin. Substantial organic loading from nonpoint sources throughout the watershed occurs during run-off events. Decay of this organic matter is attributed to low dissolved oxygen, especially during low or base flow conditions. Additionally, low DO is also measured after flood events. Decaying organic material reduces dissolved oxygen concentration of flood water inundating the flood plain. As water drains back into the river channel, the DO is greatly reduced. Agricultural activities such as livestock operations, grazing in riparian zones, lack of riparian vegetation, and row crop production heavily contribute to the amount of suspended sediments and bacteria in the James River basin.

Moccasin Creek (from the James River to Section 24, Township 123 North, Range 64 West) was listed as impaired for ammonia, pH, and DO in the previous reporting cycle. Previous ammonia violations were the result of wastewater discharges from the city of Aberdeen and a designated beneficial use change on Moccasin Creek. The city of Aberdeen was issued a compliance schedule to meet ammonia discharge limits and met their compliance schedule ahead of time on July 1, 2007. Since then, there have been no ammonia violations. Moccasin Creek is currently meeting water quality standards for pH and ammonia; however, is still not meeting water quality standards for dissolved oxygen. Low DO is attributed to organic loading in the watershed, coupled with stream characteristics, including the abundance of aquatic macrophytes and low flow.

Rosehill Dam in Hand County experienced heavy run-off in the spring of 2010 which overwhelmed the spillway and caused a significant breach in the dam. Rosehill Dam was reduced to intermittent stream flow and not considered a viable reservoir to support designated beneficial uses. As a result, Rosehill was removed from the 2012 303(d) list for not supporting the warmwater permanent fish life use due to dissolved oxygen. Planning is currently underway to rebuild the dam and spillway, and the project should be complete by fall of 2012. The beneficial use support status of Rosehill Dam will be considered

insufficient until sufficient water quality information is available to make a support determination and impairment decision in a future reporting cycle.

Lakes in the basin are highly eutrophic because of nutrient enrichment and siltation. Agricultural activities such as livestock operations and row crops are considered primary nonpoint pollution sources. During the 2010 reporting cycle EPA added Beirman Dam, Twin Lakes (Sanborn County) and Wilmarth Reservoir to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

The Upper James River Assessment Project was completed in 2011. Active implementation projects include the Lower James basin, and Brown County which encompasses watersheds of Richmond Lake, Elm Lake-Elm River, Moccasin Creek, Willow Reservoir, and the Maple River. Implementation efforts pertaining to Lake Mitchell and Firesteel Creek are being conducted under the Lower James Basin project.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 29: James River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Amsden Dam SD-JA-L-AMSDEN_01	Day County	L1	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
Beaver Lake SD-JA-L-BEAVER_01	Yankton County	L2	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Bierman Dam SD-JA-L-BIERMAN_01	Spink County	L3	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Source Unknown	5	YES - 2
Bullhead Lake SD-JA-L-BULLHEAD_02	Marshall County (formerly SD-BS-L-BULLHEAD_02)	L4	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	NA NA NA NA			3	NO
Lake Byron SD-JA-L-BYRON_01	Beadle County	L5	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NA FULL NA NON	 pH (high)		5*	YES - 2
Lake Carthage SD-JA-L-CARTHAGE_01	Miner County	L6	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Source Unknown	5	YES - 2
Cattail Lake SD-JA-L-CATTAIL_01	Marshall County (formerly SD-BS-L-CATTAIL_01)	L7	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
Lake Cavour SD-JA-L-CAVOUR_01	Beadle County	L8	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
Clear Lake SD-JA-L-CLEAR_M_01	Marshall County (formerly SD-BS-L-CLEAR_M_01)	L9	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
Cottonwood Lake SD-JA-L-COTTONWOOD_01	Spink County	L10	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1*	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Cottonwood Lake SD-JA-L-COTTONWOOD_M_01	Marshall County (formerly SD-BS-L-COTTONWOOD_01)	L11	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Cresbard Lake SD-JA-L-CRESBARD_01	Faulk County	L12	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2
Elm Lake SD-JA-L-ELM_01	Brown County	L13	DENR	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL FULL	 		1*	NO
Lake Faulkton SD-JA-L-FAULKTON_01	Faulk County	L14	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NA NA NON	 pH (high)		5*	YES - 2
Four Mile Lake SD-JA-L-FOUR_MILE_01	Marshall County (formerly SD-BS-L-FOUR_MILE_01)	L15	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL INS INS NON	 pH (high)		5	YES - 2
Lake Hanson SD-JA-L-HANSON_01	Hanson County	L16	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL	 		1*	NO
Henry Reservoir SD-JA-L-HENRY_01	Near Scotland, SD	L17	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL	 		1	NO
Jones Lake SD-JA-L-JONES_01	Hand County	L18	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2
Latham Lake SD-JA-L-LATHAM_01	Faulk County	L19	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL NON NON NON	 Oxygen, Dissolved Oxygen, Dissolved Oxygen, Dissolved		5	YES - 2
Lake Louise SD-JA-L-LOUISE_01	Hand County	L20	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Loyalton Dam SD-JA-L-LOYALTON_01	Edmunds County	L21	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
Menno, Lake SD-JA-L-MENNO_01	Hutchinson County	L22	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NA NA INS			2	NO
Mina Lake SD-JA-L-MINA_01	Edmunds County	L23	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NON NON NON	 Oxygen, Dissolved Oxygen, Dissolved Oxygen, Dissolved		5*	YES - 2
Lake Mitchell SD-JA-L-MITCHELL_01	Davison County	L24	DENR	Domestic Water Supply Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL NON	 pH (high)		5*	YES - 2
North Buffalo Lake SD-JA-L-N_BUFFALO_01	Marshall County (formerly SD-BS-L-N_BUFFALO_01)	L25	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Nine Mile Lake SD-JA-L-NINE_MILE_01	Marshall County (formerly SD-BS-L-NINE_MILE_01)	L26	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	NON FULL FULL NON	pH (high) pH (high)		5	YES - 2
North Scatterwood Lake SD-JA-L-NORTH_SCATTERWOOD_01	Edmunds County	L27	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
Pierpont Lake SD-JA-L-PIERPONT_01	Day County	L28	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL INS INS NON	 Temperature		5	YES - 2
Ravine Lake SD-JA-L-RAVINE_01	Beadle County	L29	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON NON	 Oxygen, Dissolved Oxygen, Dissolved Oxygen, Dissolved		5*	YES - 2
Lake Redfield SD-JA-L-REDFIELD_01	Spink County	L30	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL NA NA NON	 Oxygen, Dissolved		5*	YES - 2

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Richmond Lake SD-JA-L-RICHMOND_01	Brown County	L31	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1*	NO
Rosehill Lake SD-JA-L-ROSEHILL_01	Hand County	L32	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	INS INS INS INS			3*	NO
Rosette Lake SD-JA-L-ROSETTE_01	Edmunds County	L33	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Roy Lake SD-JA-L-ROY_01	Marshall County (formerly SD-BS-L-ROY_01)	L34	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
South Red Iron Lake SD-JA-L-S_RED_IRON_01	Marshall County (formerly SD-BS-L-S_RED_IRON_01)	L35	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
South Buffalo Lake SD-JA-L-SOUTH_BUFFALO_01	Marshall County (formerly SD-BS-L-SOUTH_BUFFALO_01)	L36	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Oxygen, Dissolved		5	YES - 2
Twin Lakes SD-JA-L-TWIN_01	Sanborn County	L37	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Source Unknown 	5	YES - 2
Twin Lakes SD-JA-L-TWIN_02	Spink County	L38	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Wilmarth Lake SD-JA-L-WILMARTH_01	Aurora County	L39	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^ pH (high)	 Source Unknown 	5	YES - 2
Wylie Lake SD-JA-L-WYLIE_01	Brown County	L40	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	NA NA NA NA			3	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Dawson Creek SD-JA-R-DAWSON_01	James River to Lake Henry	R1	DENR	Fish/Wildlife Prop, Rec, Stock	INS			4A*	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	FULL				
Elm River SD-JA-R-ELM_01	Elm Lake to mouth	R2	DENR	Domestic Water Supply	FULL			1	NO
			USGS	Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Firesteel Creek SD-JA-R-FIRESTEEL_01	West Fork Firesteel Creek to mouth	R3	DENR	Domestic Water Supply	FULL			5*	YES - 2
			USGS	Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Permanent Fish Life	FULL				
Foot Creek SD-JA-R-FOOT_01_USGS	Near Aberdeen, SD	R4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
			USGS	Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Marginal Fish Life	NON	Oxygen, Dissolved			
Foster Creek Tributary SD-JA-R-FOSTER_TRIB_01_USGS	Near Carpenter, SD	R5	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Tributary of Howard Creek SD-JA-R-HOWARD_TRIB_01_USGS	Near Leola, SD	R6	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
James River SD-JA-R-JAMES_01	North Dakota border to Mud Lake Reservoir	R7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			
James River SD-JA-R-JAMES_02	Mud Lake Reservoir	R8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
James River SD-JA-R-JAMES_03	Columbia Road Reservoir	R9	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			
James River SD-JA-R-JAMES_04	Columbia Road Reservoir to near US HWY 12	R10	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
			USGS	Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
James River SD-JA-R-JAMES_05	US HWY 12 to Mud Creek	R11	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON NON	 Oxygen, Dissolved Oxygen, Dissolved		5	YES - 1
James River SD-JA-R-JAMES_06	Mud Creek to James River Diversion Dam	R12	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON NON	 Oxygen, Dissolved Oxygen, Dissolved		5	YES - 1
James River SD-JA-R-JAMES_07	James River Diversion Dam to Huron 3rd Street Dam	R13	DENR City of Huron	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON NON	 Oxygen, Dissolved Oxygen, Dissolved		5	YES - 1
James River SD-JA-R-JAMES_08	Huron 3rd Street Dam to Sand Creek	R14	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids		5	YES - 1
James River SD-JA-R-JAMES_09	Sand Creek to I-90	R15	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids	Livestock (Grazing or Feeding Operations) Crop Production (Crop Land or Dry Land)	5	YES - 1
James River SD-JA-R-JAMES_10	I-90 to Yankton County Line	R16	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids		5	YES - 1
James River SD-JA-R-JAMES_11	Yankton County line to Mouth	R17	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids	Grazing in Riparian or Shoreline Zones Crop Production (Crop Land or Dry Land)	5*	YES - 1
Moccasin Creek SD-JA-R-MOCCASIN_01	S24, T123N, R64W to Headwaters	R18	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL	 		1	NO
Moccasin Creek SD-JA-R-MOCCASIN_02	James River to S24, T123N, R64W	R19	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL NON NON	 Oxygen, Dissolved Oxygen, Dissolved		5*	YES - 1

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Mud Creek SD-JA-R-MUD_01	James River to Hwy 37	R20	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Marginal Fish Life	NON	Oxygen, Dissolved			
Pierre Creek SD-JA-R-PIERRE_01	James River to S11, T102N, R58W	R21	DENR	Fish/Wildlife Prop, Rec, Stock	INS			5*	YES - 1
				Irrigation Waters	INS				
				Limited Contact Recreation	INS-TH	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	FULL				
Tributary of Preacher's Run Creek SD-JA-R-PREACHERS_RUN_TRIB_01_USGS	At Ipswich, SD	R22	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Rock Creek SD-JA-R-ROCK_01_USGS	S9, T103N, R59W to headwaters	R23	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Snake Creek SD-JA-R-SNAKE_01	James River to confluence with SF Snake Creek	R24	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			
Stony Run Creek SD-JA-R-STONYRUN_01_H	headwaters to Stony Run Lake	R25		Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	NA				
Turtle Creek SD-JA-R-TURTLE_01	James River to S17, T113N, R65W	R26	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	NON	pH (high)			
Wolf Creek SD-JA-R-WOLF_01	Wolf Creek Colony to S5, T103N, R56W	R27	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Marginal Fish Life	FULL				
Wolf Creek SD-JA-R-WOLF_02	Just above Wolf Creek Colony to the mouth.	R28	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Marginal Fish Life	NON	Total Suspended Solids	Non-Point Source		
Wolf Creek SD-JA-R-WOLF_SP_01	Turtle Creek to S10, T114N, R66W	R29	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				

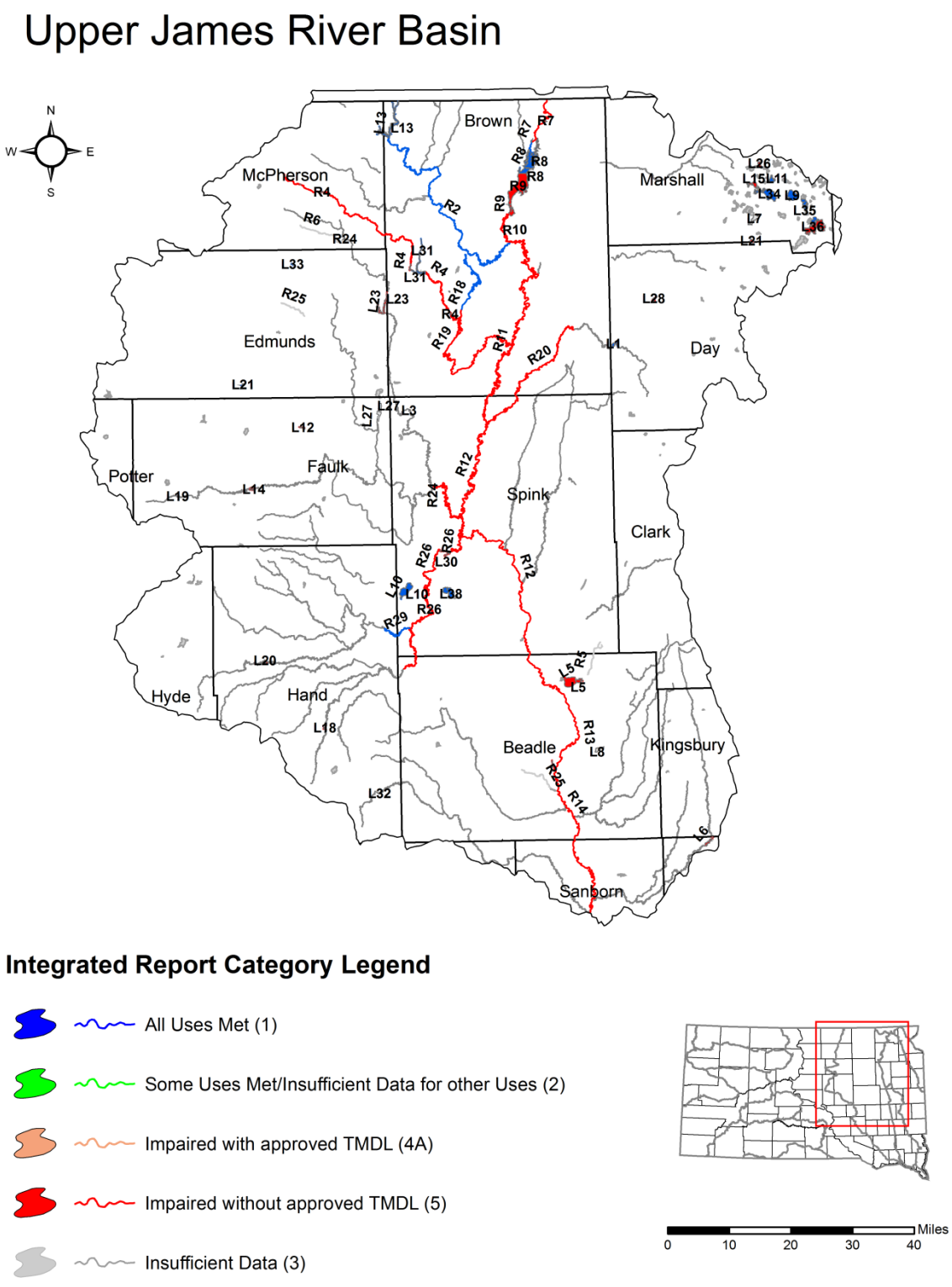


Figure 17: Upper James River Basin

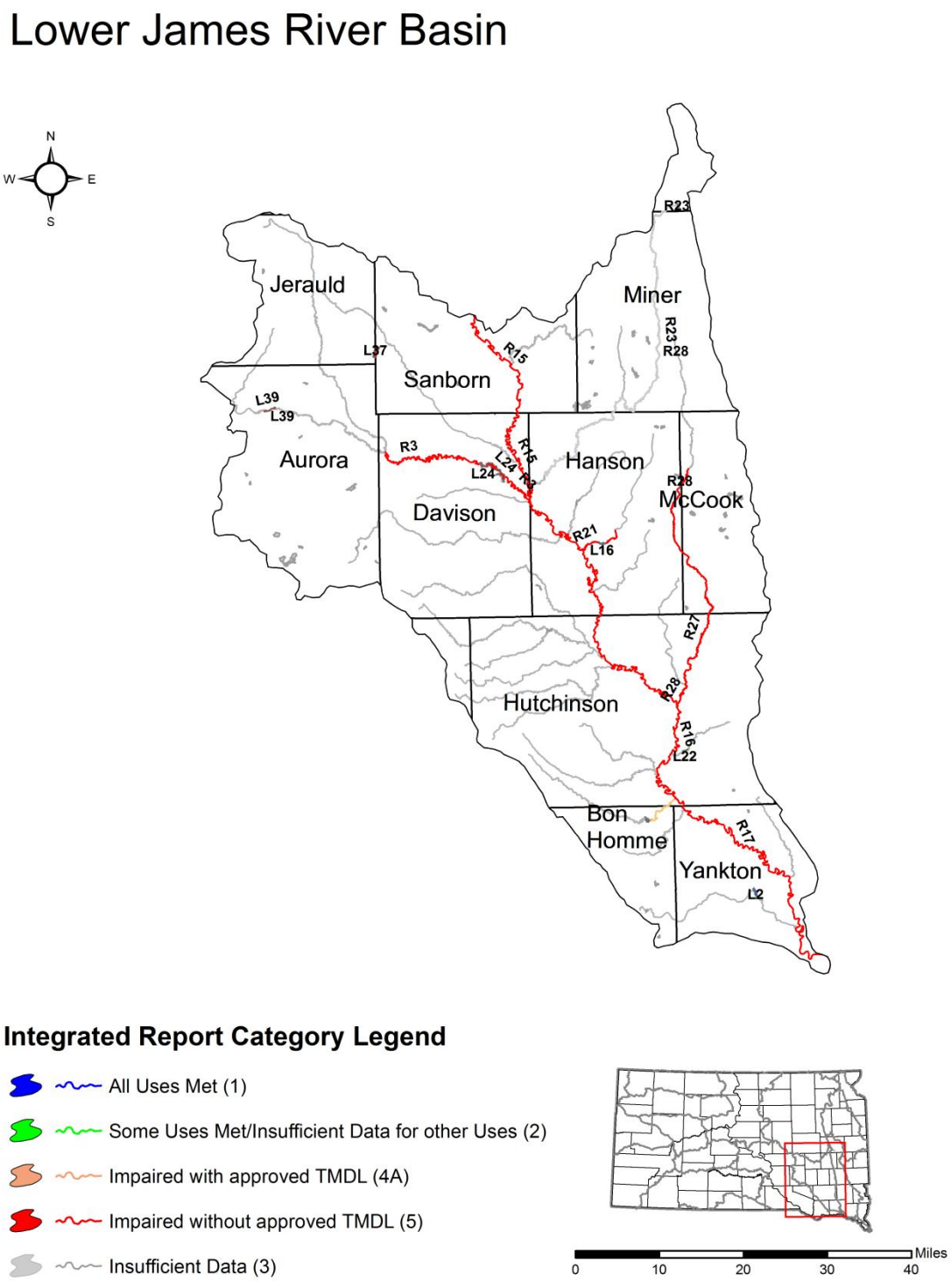


Figure 18: Lower James River Basin

Little Missouri River Basin (Figure 19, Table 30)

The Little Missouri River basin is a small basin located in the northwestern corner of the state. The river enters the state from southeastern Montana and drains 583 square miles before exiting into North Dakota. The basin's economy is dominated by agriculture with approximately 90% of the land being used for agricultural production. The majority of this land is rangeland due to limited rainfall.

There are no monitored lakes within this basin and DENR has one water quality monitoring station located on the Little Missouri River.

The USGS provided water quality data from a station on the Little Missouri River at Camp Crook.

The Little Missouri River is listed as impaired for TSS. There are currently no watershed assessment or implementation projects in the basin.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 30: Little Missouri River Basin Information

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Little Missouri River SD-LM-R-LITTLE_MISSOURI_01	Montana border to North Dakota border	R1	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			

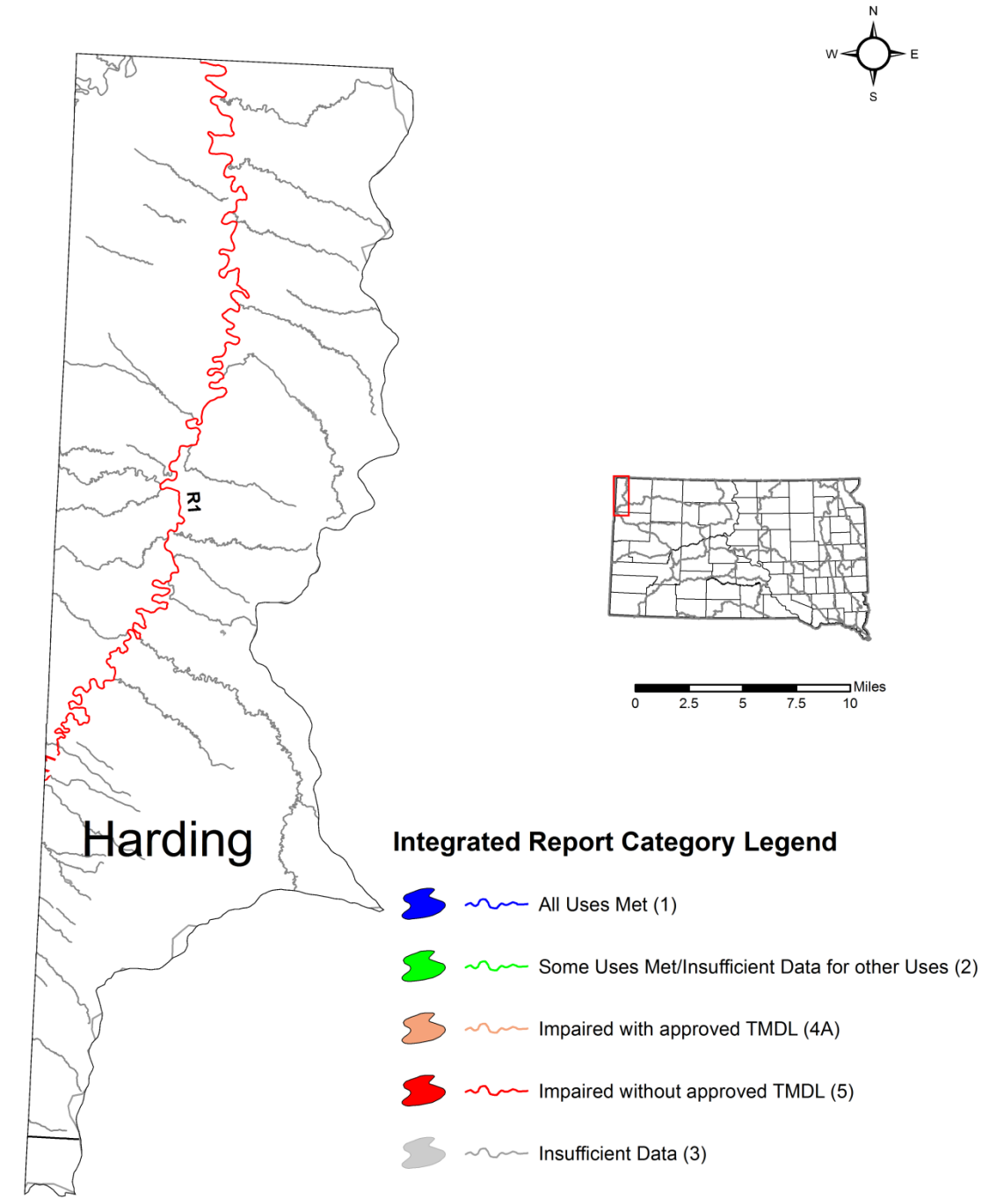


Figure 19: Little Missouri River Basin

Minnesota River Basin (Figure 20, Table 31)

The Minnesota River basin is found in the northeastern corner of the state. The basin is bordered on the north by the Red River tributaries, on the west by the Prairie Coteau Pothole region, on the south by the Big Sioux River, and on the east by the South Dakota/Minnesota border. The basin drains an area of 1,637 square miles within South Dakota.

DENR has assessed nine lakes and maintains nine water quality monitoring sites within the Minnesota basin. In addition, data from two of DENR's candidate reference sites were used.

The USGS has water quality monitoring sites on Cobb Creek and Big Coulee Creek in the basin. The data are very limited, and the only parameters measured were specific conductance and water temperature.

The Upper Minnesota River Watershed Water Quality Assessment project which included the Whetstone and Yellowbank River watersheds was completed in fall 2011. This investigation resulted in *E. coli* listings for the South Fork Whetstone River, North Fork Yellowbank River, and South Fork Yellowbank River. The Whetstone River was determined to be fully supporting its designated beneficial uses. An Implementation project for the Upper Minnesota River basin in Grant and Roberts counties is planned to begin in the summer of 2012. This project was included as part of the NE Glacial lakes project that currently encompasses Day and Marshall Counties.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 31: Minnesota River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Lake Alice SD-MN-L-ALICE_01	Deuel County	L1	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
Big Stone Lake SD-MN-L-BIG_STONE_01	Roberts County	L2	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL NON	 Temperature		5*	YES - 2
Lake Cochrane SD-MN-L-COCHRANE_01	Deuel County	L3	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1	NO
Lake Drywood North SD-MN-L-DRYWOOD_NORTH_01	Roberts County (formerly SD-BS-L-DRYWOOD_NORTH_01)	L4	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
Fish Lake SD-MN-L-FISH_01	Deuel County	L5	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1*	NO
Lake Hendricks SD-MN-L-HENDRICKS_01	Brookings County	L6	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2
Oak Lake SD-MN-L-OAK_01	Brookings County	L7	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS FULL FULL INS			2	NO
Lake Oliver SD-MN-L-OLIVER_01	Deuel County	L8	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1*	NO
Punished Woman Lake SD-MN-L-PUNISHED_WOMAN_01	Codington County	L9	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 pH (high)		5*	YES - 2
Turtle Foot Lake SD-MN-L-TURTLE_FOOT_01	Marshall County	L10	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Big Coulee Creek SD-MN-R-BIG_COULEE_01_USGS	Near Peever, SD	R1	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Cobb Creek SD-MN-R-COBB_01_USGS	SD/MN border to S19, T115N, R47W	R2	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	INS INS INS INS			3	NO
Lac Qui Parle River, West Branch SD-MN-R-LAC_QUI_PARLE_W_BR_01	SD/MN border to S8, T115N, R47W	R3	DENR	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL FULL			1	NO
Little Minnesota River SD-MN-R-LITTLE_MINNESOTA_01	Big Stone Lake to S15, T128N, R52W	R4	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON NON	 Oxygen, Dissolved Oxygen, Dissolved		5	YES - 2
Mud Creek SD-MN-R-MUD_01	SF Yellowbank R to S22, T118N, R48W	R10	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Warmwater Marginal Fish Life Limited Contact Recreation	FULL FULL NON NON	 Oxygen, Dissolved Oxygen, Dissolved		5	YES-1
Whetstone River SD-MN-R-WHETSTONE_01	SD/MN border to confluence with its north and south forks	R5	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL	 		1	NO
South Fork Whetstone River SD-MN-R-WHETSTONE_S_FORK_01	Headwaters to Lake Farley	R6	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL NON FULL	 Escherichia coli 		5	YES - 1
South Fork Whetstone River SD-MN-R-WHETSTONE_S_FORK_02	Lake Farley to mouth	R7	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL NON FULL	 Escherichia coli 		5	YES - 1
North Fork Yellow Bank River SD-MN-R-YELLOW_BANK_N_FORK_01	SD/MN border to S27, T120N, R48W	R8	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NON FULL	 Escherichia coli 		5	YES - 1
South Fork Yellow Bank River SD-MN-R-YELLOW_BANK_S_FORK_01	SD/MN border to S33, T118N, R49W	R9	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL FULL FULL NON	 Escherichia coli		5	YES - 1

Minnesota River Basin

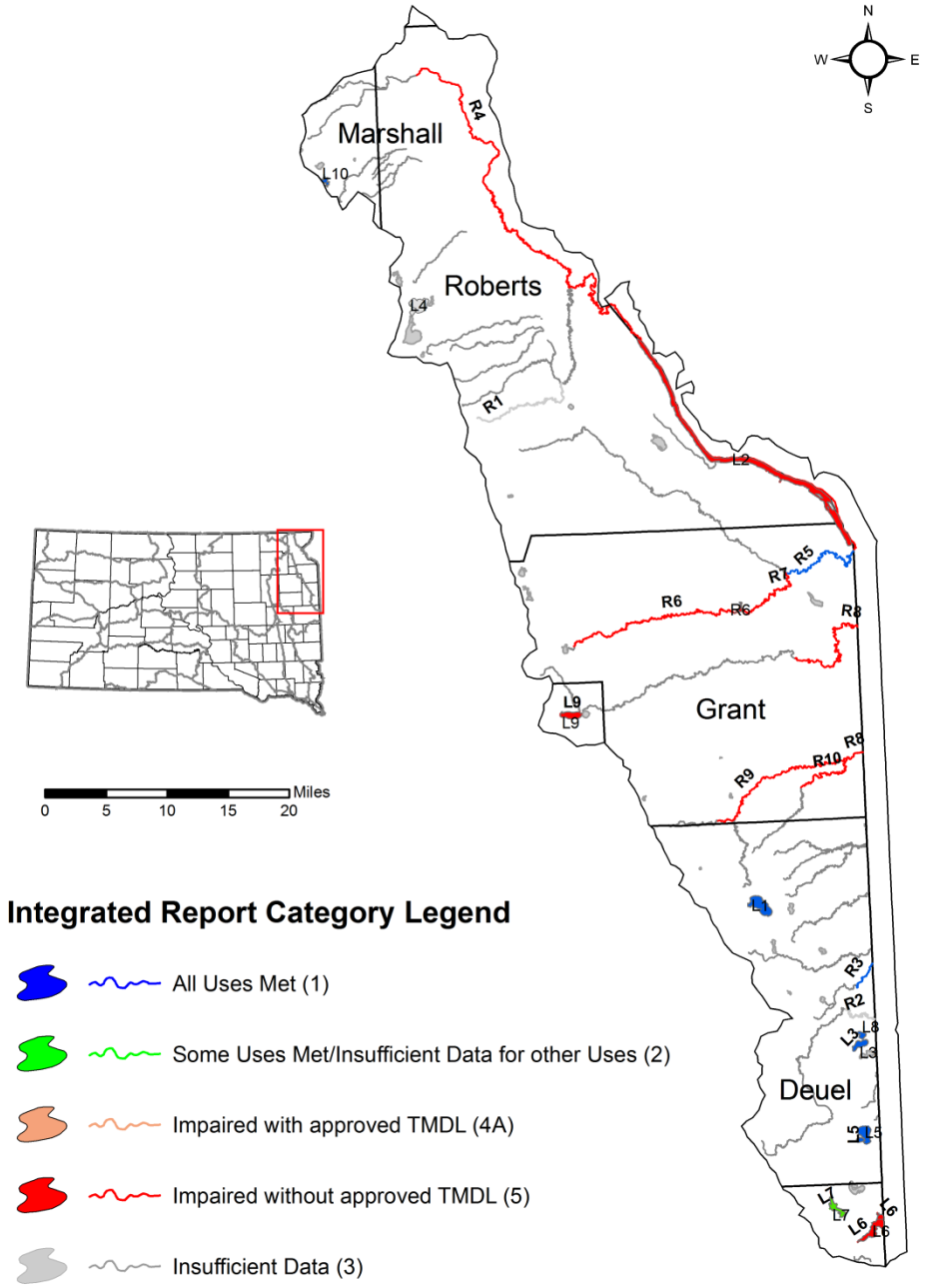


Figure 20: Minnesota River Basin

Missouri River Basin (Figures 21 and 22, Table 32)

The Missouri River is the largest body of water in South Dakota. It flows through the middle of the state to form what is commonly referred to as either "east" or "west" river. The river enters the state on the north from North Dakota and flows south until it reaches the vicinity of Pierre. Along this southern course it receives significant flows from the Grand, Moreau, and Cheyenne River basins. From Pierre, the river flows generally east-southeast until it exits the state on the southeast tip after receiving contributing flows from the Bad, White, James, Vermillion, Niobrara, and Big Sioux River basins. The Missouri River basin is the largest basin in South Dakota and drains approximately 15,865 square miles.

The dominant feature of the Missouri River in South Dakota is the presence of four impoundments: Lake Oahe at Pierre (Oahe Dam), Lake Sharpe at Fort Thompson (Big Bend Dam), Lake Francis Case at Pickstown (Ft. Randall Dam), and Lewis and Clark Lake at Yankton (Gavins Point Dam). The largest of these reservoirs is Lake Oahe with 22,240,000 acre-feet of storage capacity. The impoundments serve for flood control, hydroelectric generation, irrigation, municipal water use, water related recreation, and downstream navigation. The 70-mile reach from the Gavins Point Dam to Sioux City, Iowa, is the last major free-flowing segment of the Missouri River in the state.

DENR has assessed 22 lakes and maintains ten water quality monitoring stations within the Missouri River basin. In addition, data from DENR's 2005-2006 Missouri River Monitoring Project were used. USGS also has several water quality sites located on the mainstem of the Missouri River and several tributaries. USGS data on the Missouri River itself are fairly extensive and include data for dissolved oxygen, pH, water temperature, sodium adsorption ratio, alkalinity, sulfate, nitrates, total dissolved solids, ammonia, and chlorides. USACE summary data from the 2009 Report "Water Quality Conditions in the Missouri River Mainstem System" were also used in determining waterbody support on Lake Oahe and Lake Sharpe.

Lake Sharpe is listed in the Missouri River basin tables as nonsupporting for the (2) Coldwater permanent fish life propagation beneficial use for not meeting the temperature criterion. USACE profile data summaries and DENR data were used to assess water temperature. During summer months, the temperature criterion is often met in Lake Sharpe immediately downstream of Oahe Dam; however, the water can quickly heat up further downstream. Water in Lake Sharpe is well-mixed due to the short retention time in the reservoir, relative shallowness, and bottom withdrawal from Big Bend Dam. A significant thermocline does not typically develop in Lake Sharpe. By late summer, coldwater habitat is limited to coldwater discharges from Oahe Dam. It is important to note that the temperature of water discharged from Oahe Dam is dependent upon pool elevation and discharge rate. During years with low pool elevation in Lake Oahe, the thermocline is established below the intakes, resulting in warmer water withdrawal from the epilimnion or metalimnion. During years with high pool elevation, the thermocline establishes above the intakes resulting in coldwater withdrawals from the hypolimnion. However, during high pool elevation years, the discharge rate from Oahe Dam also influences the temperature of water discharged. Average or low discharge rates result in cold water drawn horizontally from the hypolimnion. During high discharge rates or when USACE is evacuating water from Lake Oahe, less dense water from the epilimnion or metalimnion is drawn down and results in periods of warmer water discharges. Profile data collected by DENR and USACE profile data summaries indicate periods of time during

summer months when no coldwater habitat exists and none of Lake Sharpe meets coldwater temperature criterion.

A significant temperature-depth gradient occurs on Lake Oahe in the near-dam lacustrine area during summer months. This results in the development of a strong thermocline approximately 20 to 25 meters below the surface. The longitudinal extent of the coldwater habitat is dependent upon pool elevation and thermocline depth. The shallower upper reaches of the reservoir are well-mixed by late summer and do not display significant vertical variations in temperature. However, this area may still provide coldwater habitat based on pool elevation. USACE profile data summaries were used to assess water temperature and resulting coldwater habitat in Lake Oahe. Thermal profile contour plots measured during the months of May, June, July, and August 2009, indicate the temperature criterion was met longitudinally throughout the length of the reservoir within the state boundary. Thermal profile contour plots measured in September 2009 indicate the temperature criterion was met longitudinally from Oahe Dam to near river mile 1190 (Indian Creek). During this time, pool elevation was high and ranged from 1613 to 1609 feet mean sea level (ft-msl). Thermal profile plots measured in August 2007 indicate temperature criterion was met from Oahe Dam to near river mile 1155 (near Whitlock Bay). Pool elevation measured approximately 1580 ft-msl. In comparison, the additional 30 feet of water in 2009 resulted in an additional 70 river miles of reservoir that met temperature criterion and provided coldwater habitat. Despite fluctuations in pool elevation and corresponding coldwater habitat, Lake Oahe is fully supporting its designated beneficial uses. Assessments by GF&P indicate Lake Oahe provides abundant coldwater habitat to support the thriving coldwater fishery. Coldwater species display good growth and condition and are not negatively impacted by minor fluctuations in reservoir levels and resulting coldwater habitat.

Most lakes in the Missouri River basin are highly eutrophic because of nutrient enrichment and siltation. Agricultural activities are the primary sources of pollution. During the 2010 reporting cycle EPA added Lake Pocasse, Lake Campbell (Campbell County), and Cottonwood Lake (Sully County) to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

The spillway at Academy Reservoir in Charles Mix County was compromised by flood waters in the spring of 2010. As a result, Academy de-watered and is no longer considered a viable reservoir capable of supporting its designated beneficial uses. There are currently no plans at the federal, state or local level to rebuild the spillway. Academy reservoir was removed from the support tables and 303(d) analysis records for the 2012 reporting cycle.

There are currently no active assessment projects in the Missouri River basin. The only active implementation project is in the Lewis and Clark watershed.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 32: Missouri River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Lake Andes SD-MI-L-ANDES_01	Charles Mix County	L1	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL NON NON NON	 Oxygen, Dissolved Oxygen, Dissolved Oxygen, Dissolved		5	YES - 2
Brakke Dam SD-MI-L-BRAKKE_01	Lyman County	L2	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1*	NO
Burke Lake SD-MI-L-BURKE_01	Gregory County	L3	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Oxygen, Dissolved pH (high)		4A*	NO
Byre Lake SD-MI-L-BYRE_01	Lyman County	L4	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1*	NO
Lake Campbell SD-MI-L-CAMPBELL_01	Campbell County	L5	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^ pH (high)	 Source Unknown	5	YES - 2
Corsica Lake SD-MI-L-CORSICA_01	Douglas County	L6	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
Cottonwood Lake SD-MI-L-COTTONWOOD_01	Sully County	L7	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Source Unknown	5	YES - 2
Dante Lake SD-MI-L-DANTE_01	Charles Mix County	L8	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL NON	 Oxygen, Dissolved		4A*	NO
Eureka Lake SD-MI-L-EUREKA_01	McPherson County	L9	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NA NA FULL			2	NO
Fairfax Lake SD-MI-L-FAIRFAX_01	Gregory County	L10	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NA NA FULL			2	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Fate Dam SD-MI-L-FATE_01	Lyman County	L11	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1*	NO
Geddes Lake SD-MI-L-GEDDES_01	Charles Mix County	L12	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Oxygen, Dissolved pH (high)		5*	YES - 2
Lake Hiddenwood SD-MI-L-HIDDENWOOD_01	Walworth County	L13	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON NON	 Oxygen, Dissolved Oxygen, Dissolved Oxygen, Dissolved		5*	YES - 2
Lake Hurley SD-MI-L-HURLEY_01	Potter County	L14	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NA NA FULL-TH	 Mercury in fish tissue	 Non-Point Source	5	YES - 1
McCook Lake SD-MI-L-MCCOOK_01	Union County	L15	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Temperature		5*	YES - 2
Platte Lake SD-MI-L-PLATTE_01	Charles Mix County	L16	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Lake Pocasse SD-MI-L-POCASSE_01	Campbell County	L17	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NON NON NON	 Chlorophyll-a ^ Chlorophyll-a ^ Chlorophyll-a ^	 Source Unknown 	5	YES - 2
Potts Dam SD-MI-L-POTTS_01	Potter County	L18	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NA NA FULL			2	NO
Roosevelt Lake SD-MI-L-ROOSEVELT_01	Tripp County	L19	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL-TH FULL FULL FULL	Mercury in fish tissue		5	YES - 1
Sully Lake SD-MI-L-SULLY_01	Sully County	L20	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Sully Dam SD-MI-L-SULLY_DAM_01	Tripp County	L21	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL NA NA INS			2	NO
Swan Lake SD-MI-L-SWAN_01	Walworth County	L22	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
Lake Yankton SD-MI-L-YANKTON_01	Yankton County	L23	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL NA NA FULL			2	NO
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Andes Creek SD-MI-R-ANDES_01_USGS	Near Armour, SD	R1	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	NA NA			3	NO
Campbell Creek SD-MI-R-CAMPBELL_01_USGS	Near Lee's Corner	R2	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Choteau Creek SD-MI-R-CHOTEAU_01	Lewis & Clark Lake to S34, T96N, R63W	R3	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1*	NO
Crow Creek SD-MI-R-CROW_01	Bedashosha Lake to Jerauld County line	R4	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
East Fork Platte Creek SD-MI-R-EAST_FORK_PLATTE_01_USGS	Near Aurora Center, SD	R5	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Elm Creek SD-MI-R-ELM_01_USGS	Near Gann Valley, SD	R6		Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	NA NA NA NA			3	NO
Emanuel Creek SD-MI-R-EMANUEL_01	Lewis and Clark Lake to S20, T94N, R60W	R7	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	INS INS NON NON	 Escherichia coli Fecal Coliform Total Suspended Solids		4A*	NO

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Missouri River (Lake Francis Case) SD-MI-R-FRANCIS_CASE_01	Big Bend Dam to Fort Randall Dam	R8	DENR	Commerce & Industry	FULL			1	NO
				Domestic Water Supply	FULL				
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Missouri River (Lewis and Clark Lake) SD-MI-R-LEWIS_AND_CLARK_01	Fort Randall Dam to North Sioux City	R9	DENR USGS	Commerce & Industry	FULL			1	NO
				Domestic Water Supply	FULL				
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Medicine Creek SD-MI-R-MEDICINE_01	Lake Sharpe to US Hwy 83	R10	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Medicine Knoll Creek SD-MI-R-MEDICINE_KNOLL_01	Lake Sharpe to confluence with its north and south forks	R11	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	INS				
				Warmwater Marginal Fish Life	INS				
Missouri River (Lake Oahe) SD-MI-R-OAHE_01	North Dakota border to Oahe Dam	R12	DENR USACE	Coldwater Permanent Fish Life	FULL			1	NO
				Commerce & Industry	FULL				
				Domestic Water Supply	FULL				
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Oak Creek SD-MI-R-OAK_01_USGS	S20, T21N, R28E to Oahe	R13	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	FULL				
Platte Creek SD-MI-R-PLATTE_01_USGS	Near Platte, SD	R14	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	FULL				

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Ponca Creek SD-MI-R-PONCA_01	SD/NE border to US Hwy 183	R15	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL-TH	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	FULL-TH	Total Suspended Solids			
Missouri River (Lake Sharpe) SD-MI-R-SHARPE_01	Oahe Dam to Big Bend Dam	R16	DENR USACE	Coldwater Permanent Fish Life	NON	Temperature		5	YES - 1
				Commerce & Industry	FULL				
				Domestic Water Supply	FULL				
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Slaughter Creek SD-MI-R-SLAUGHTER_01	Missouri River to headwaters	R17	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Snake Creek SD-MI-R-SNAKE_01_USGS	Headwaters to Academy Lake	R18	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Spring Creek SD-MI-R-SPRING_01	Lake Pocasse to US HWY 83	R19	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			

Upper Missouri River Basin

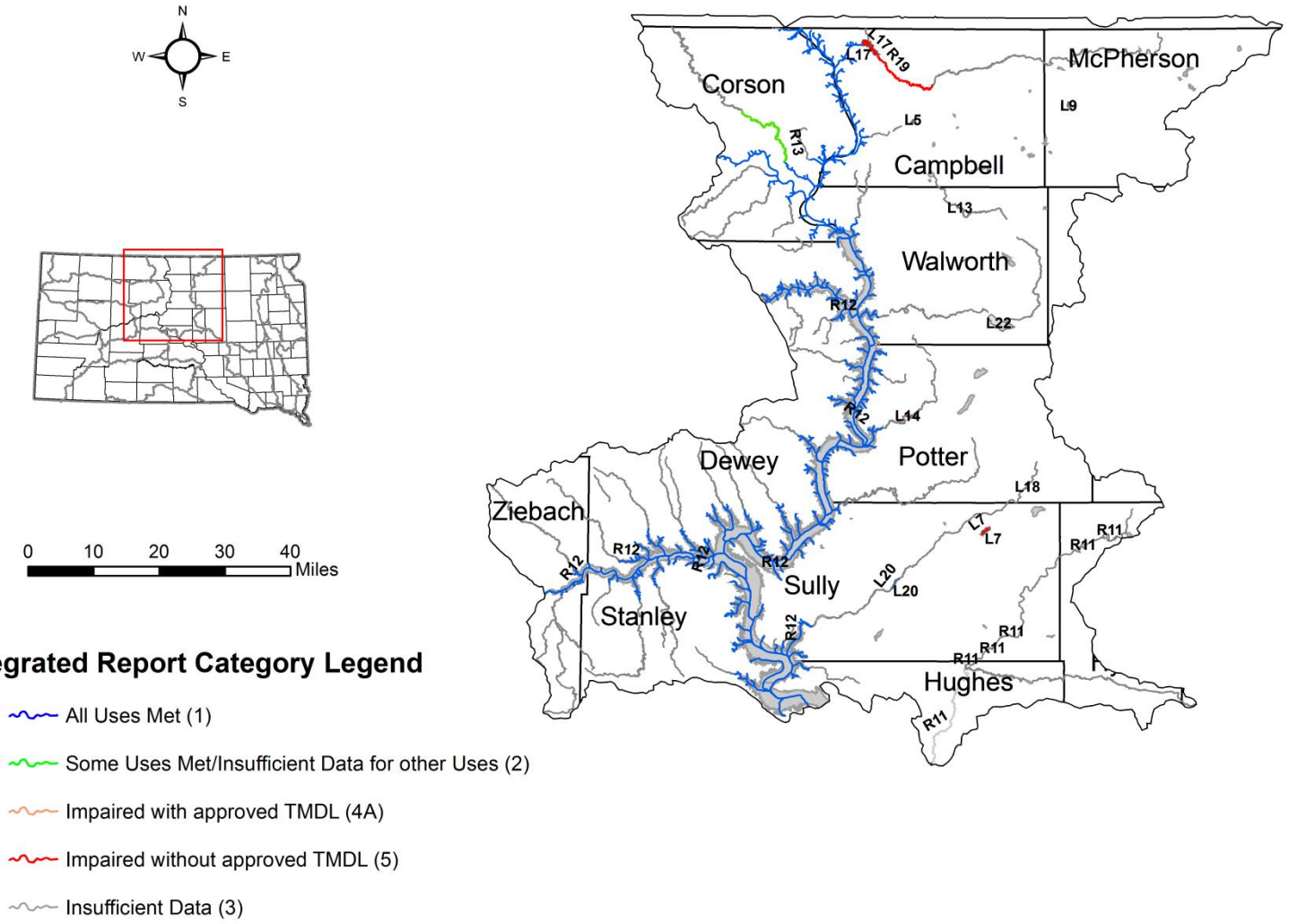


Figure 21: Upper Missouri River Basin

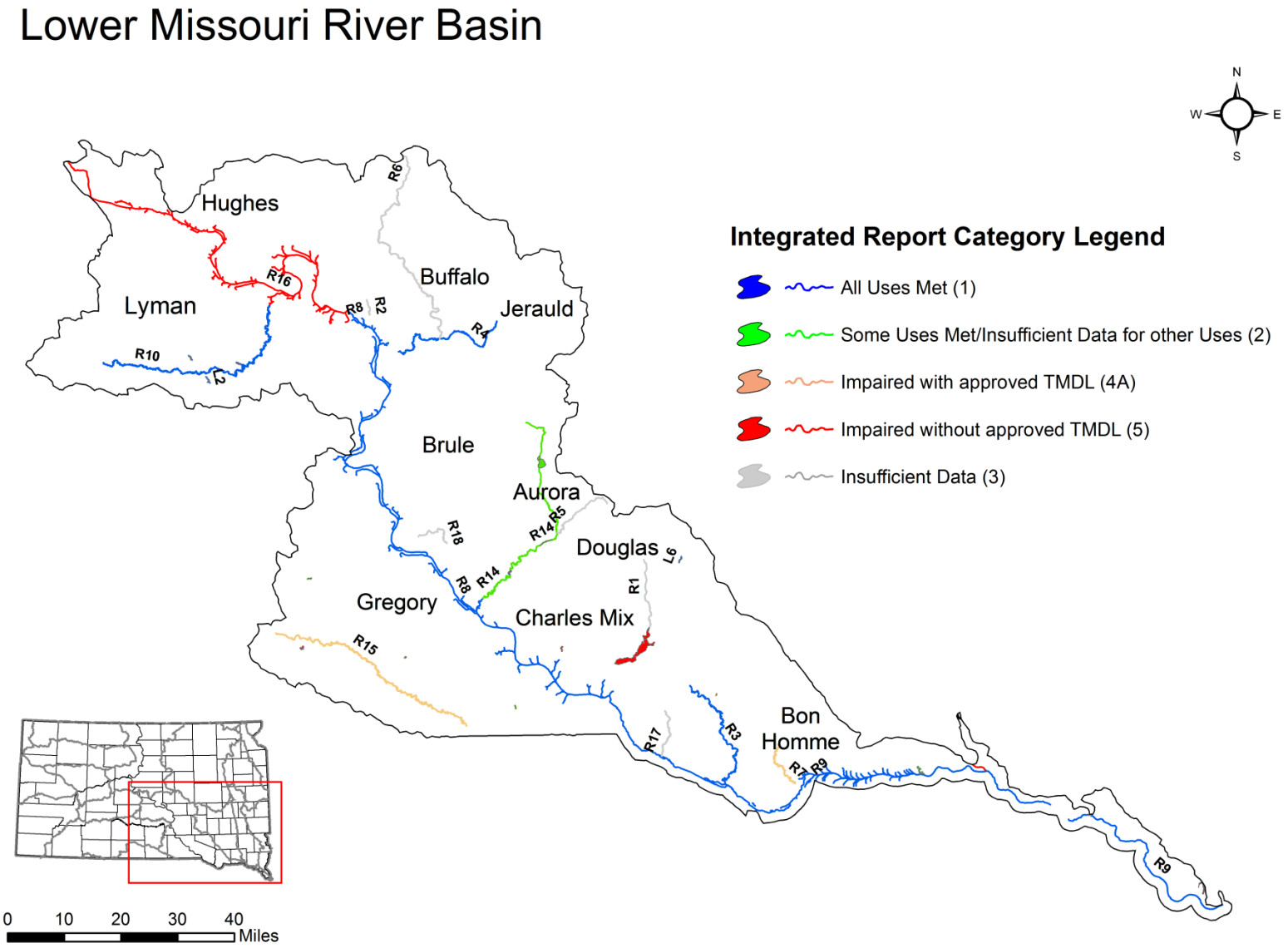


Figure 22: Lower Missouri River Basin

Moreau River Basin (Figure 23, Table 33)

The Moreau River basin is located in the northwest part of South Dakota and drains an area of 4,995 square miles. As with the Grand River basin to the north, agriculture is the mainstay of this sparsely populated basin. Population density is approximately two persons per square mile. A majority of the basin is devoted to ranching operations.

DENR maintains five water quality monitoring sites within this basin. Three of the five monitoring sites are located on the Moreau River, one is located on the South Fork Moreau, and one is located on Thunder Butte Creek.

The USGS has water quality monitoring sites on the Moreau River. The data are limited, and the only parameters measured were specific conductance and water temperature.

Water quality within the basin is marginal to poor. Much of the sediment in the drainage comes from erosive Cretaceous shales that also mineralize the water. As in the adjoining Grand River basin to the north, this leads to high levels of TDS in the water of local streams, primarily sulfate, iron, manganese, sodium, and other minerals. Other pollutants in the basin include TSS, SAR, fecal coliform, and *E. coli.*

The Moreau River is located downstream from historic uranium mining operations and is monitored for standard parameters and those associated with historic uranium mining. Waterbody support determination for the upper reach of the Moreau River was based on all measured parameters including those associated with uranium mining. This reach is listed as not supporting some beneficial use designations based on exceedances of TSS and SAR. There were no exceedances for any parameters associated with uranium mining.

There are no on-going assessment or implementation projects occurring within the Moreau basin at this time.

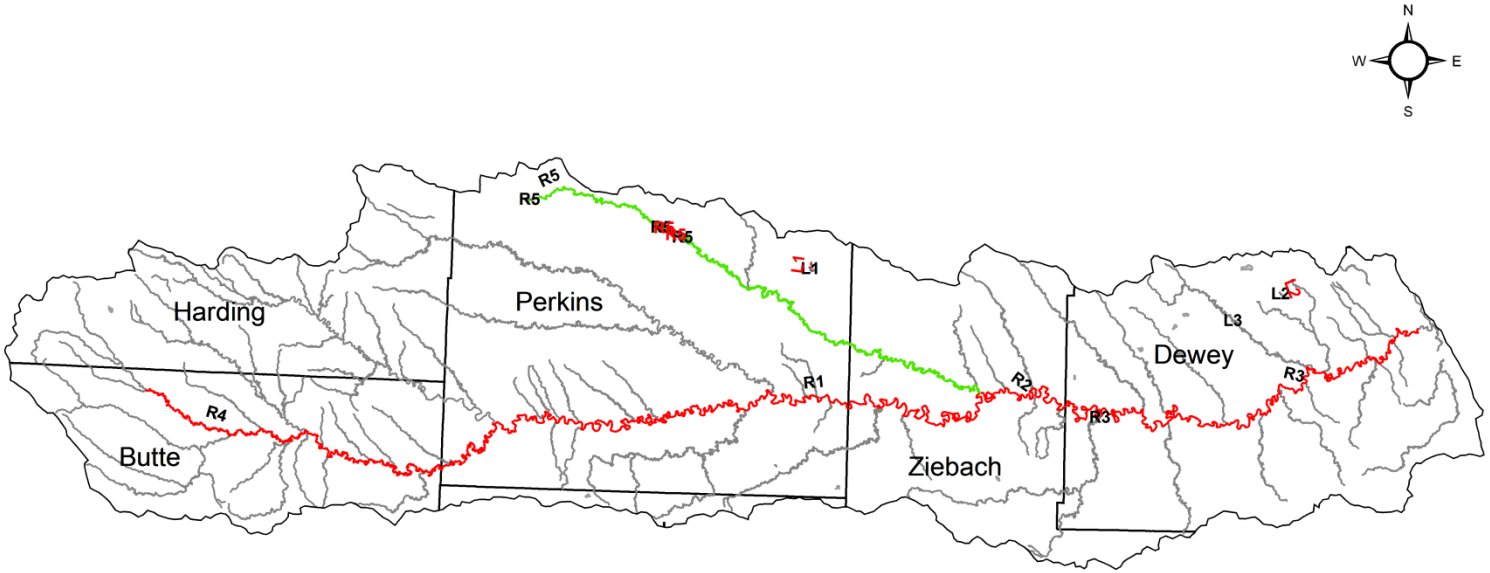
DENR has referred TMDL development for all waterbodies in the Moreau River basin to EPA. Therefore, TMDL priority and schedule have not been populated in the basin table. DENR is currently in discussions with EPA to determine next steps regarding TMDL development and prioritization for the Moreau River Basin.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 33: Moreau River Basin Information

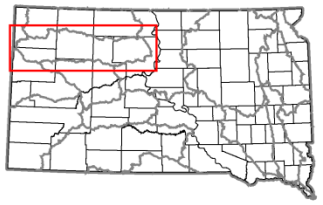
WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Coal Springs Reservoir SD-MU-L-COAL_SPRINGS_01	Perkins County	L1	DENR	Fish/Wildlife Prop, Rec, Stock	NON	Mercury in fish tissue pH (high)		5	YES-D**
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Permanent Fish Life	NON	pH (high)			
Dewberry Dam SD-MU-L-DEWBERRY_01	Dewey County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Immersion Recreation	NA				
				Limited Contact Recreation	NA				
				Warmwater Permanent Fish Life	INS				
Little Moreau No. 1 SD-MU-L-LITTLE_MOREAU_NO1_01	Dewey County	L3	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Moreau River SD-MU-R-MOREAU_01	North and South Forks to Ziebach/Perkins county line	R1	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	FULL-TH	Salinity	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Moreau River SD-MU-R-MOREAU_02	Ziebach/Perkins county line to Green Grass	R2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	FULL-TH	Salinity	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Moreau River SD-MU-R-MOREAU_03	Green Grass to mouth	R3	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES-D**
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL-TH	Escherichia coli Fecal Coliform			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Natural Sources Livestock (Grazing or Feeding Operations) Crop Production (Crop Land or Dry Land)		
South Fork Moreau River SD-MU-R-MOREAU_S_FORK_01	Alkali Creek to mouth	R4	DENR	Fish/Wildlife Prop, Rec, Stock	NON	Total Dissolved Solids		5	YES-D**
				Irrigation Waters	NON	Specific Conductance	Natural Sources		
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Thunder Butte Creek SD-MU-R-THUNDER_BUTTE_01	Headwaters to mouth	R5	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	INS				
				Warmwater Marginal Fish Life	FULL				

Moreau River Basin



Integrated Report Category Legend

- All Uses Met (1)
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)



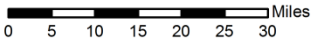


Figure 23: Moreau River Basin

Niobrara River Basin (Figure 24, Table 34)

The tributaries of the Niobrara basin that lie in South Dakota are located in the very south-central part of the state. These tributaries include the Keya Paha River and Minnechaduza Creek. These streams drain approximately 1,742 square miles in South Dakota. Agriculture is the leading source of income to the basin.

DENR has assessed Rahn Dam and maintains one water quality monitoring site on the Keya Paha River. USGS sites that had water quality information within this basin are located on Antelope Creek and Sand Creek. During the 2010 reporting cycle EPA added Rahn Dam to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

The Keya Paha River originates at the confluence with Antelope Creek in the Rosebud Indian Reservation. The river flows in a south-east direction and exits the state east of Wewela, South Dakota. The river is not supporting some designated beneficial uses due to exceedances of TSS, and fecal and *E. coli* bacteria. Land use along the Keya Paha River is primarily agriculture. Livestock on grass has been identified as the primary source of bacteria. There are no point source discharges to the Keya Paha River. A TMDL has been approved for the Keya Paha River to address the contaminants.

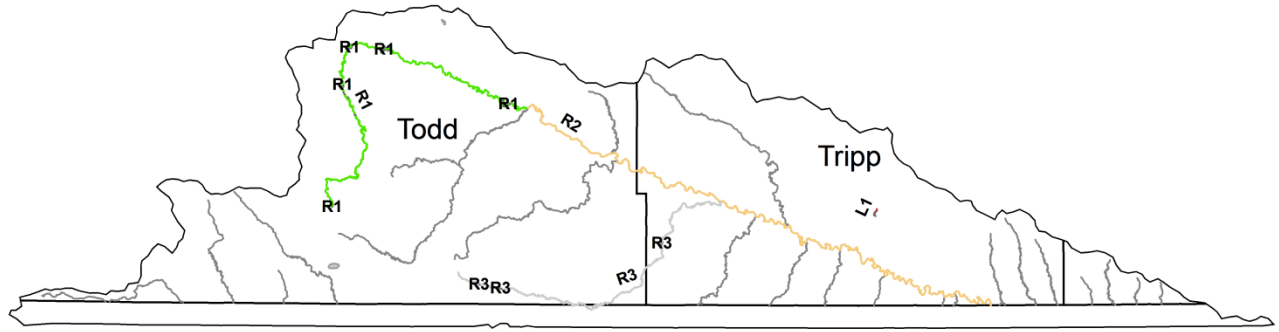
A portion of the Lewis and Clark Project (Missouri River Basin) is located in the Niobrara basin and is in the implementation phase.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 34: Niobrara River Basin Information

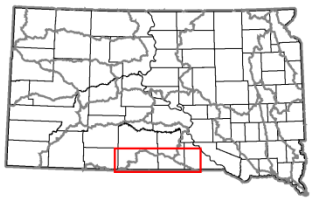
WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Rahn Lake SD-NI-L-RAHN_01	Tripp County	L1	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	NON	Chlorophyll-a ^	Source Unknown		
				Limited Contact Recreation	NON	Chlorophyll-a ^			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a ^			
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
Antelope Creek SD-NI-R-ANTELOPE_01_USGS	Near Mission, SD	R1	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	NA				
				Warmwater Semipermanent Fish Life	FULL				
Keya Paha River SD-NI-R-KEYA_PAHA_01	SD/NE border to confluence with Antelope Creek	R2	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL-TH	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	FULL-TH	Total Suspended Solids	Natural Sources		
Sand Creek SD-NI-R-SAND_01_USGS	Near Olsonville, SD	R3	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				

Niobrara River Basin



Integrated Report Category Legend

- All Uses Met (1)
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)



0 5 10 15 20 25 30 Miles

Figure 24: Niobrara River Basin

Red River Basin (Figure 25, Table 35)

The Red River basin covers the extreme northeastern corner of the state. The tributaries of the Red River that are in South Dakota drain a total of 627 square miles. Agriculture is the leading economic industry in the basin.

DENR has assessed two lakes and does not maintain any water quality monitoring sites in the Red River basin. The USGS maintains a monitoring site on La Belle Creek; however, there was insufficient data available for DENR to make a support determination.

There are no on-going assessment or implementation projects occurring within the Red River basin at this time.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 35: Red River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Lake Traverse SD-RD-L-TRAVERSE_01	Roberts County	L1	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL FULL			1	NO
White Lake SD-RD-L-WHITE_01	Marshall County	L2	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL FULL FULL			1*	NO
WATERBODY Streams/AUID	**LOCATION**	**MAP ID**	**BASIS**	**USE**	**SUPPORT**	**CAUSE**	**SOURCE**	**EPA Category**	**ON 303(d) & Priority**
La Belle Creek SD-RD-R-LA_BELLE_01_USGS	Near Veblen, SD	R1	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO

Red River Basin

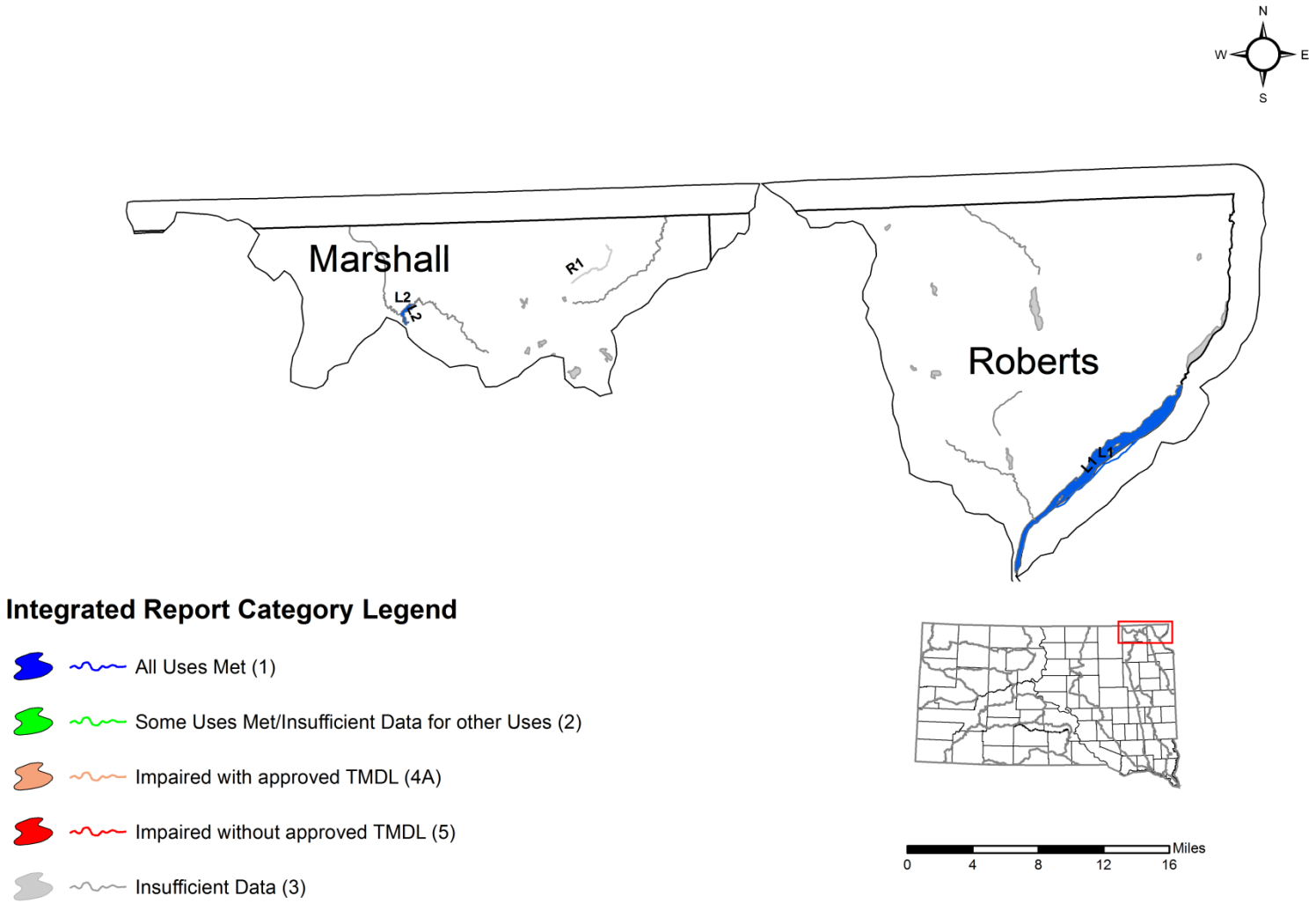


Figure 25: Red River Basin

Vermillion River Basin (Figure 26, Table 36)

The Vermillion River basin covers an area of 2,673 square miles in southeastern South Dakota. The basin is about 150 miles in length and varies in width from 12 miles in the north to 36 miles in the south. Much of the lower 22 miles of the river basin is channelized. Streams in the Vermillion River basin drain to the Vermillion River, which drains to the Missouri River near Vermillion, South Dakota. Agriculture is the leading source of income in the basin. It is estimated that 96% of the total surface area is devoted to agriculture. The remaining areas include municipalities, sand and gravel operations, and other uses.

DENR has assessed seven lakes and maintains five water quality monitoring sites within this basin. Three of the five monitoring sites are located on the Vermillion River and the other two are located on the East Fork Vermillion River. During the 2010 reporting cycle EPA added East Vermillion Lake to the 303(d) list for not supporting the designated warmwater fish life and recreation beneficial uses due to chlorophyll-*a*. This listing was based strictly on ad hoc criteria developed by EPA to address narrative standards associated with eutrophication. EPA's methodology and justification for this listing is defined in the 2010 Integrated Report.

The USGS has water quality monitoring sites in the basin including sites on the Little Vermillion River, the Vermillion River, East Fork Vermillion River, and West Fork Vermillion River. The data are limited and the only parameters measured were specific conductance and water temperature.

The upper reach of the Vermillion River is fully supporting all designated beneficial uses. The two lower reaches are nonsupporting due to exceedances of TSS. Row crops account for approximately 73% land use in the lower segments. Sediment sources are overland runoff from nearby croplands and feedlots, inflow from tributaries, and streambank erosion. There are approved TSS TMDLs for the two lower reaches of the Vermillion River.

On-going implementation projects in the Vermillion River basin include the Vermillion River watershed and Turkey Ridge Creek watershed.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 36: Vermillion River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
East Vermillion Lake SD-VM-L-E_VERMILLION_01	McCook County	L1	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	NON	Chlorophyll-a ^	Source Unknown		
				Limited Contact Recreation	NON	Chlorophyll-a ^			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a ^ Temperature			
Lake Henry SD-VM-L-HENRY_01	Kingsbury County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Marindahl Lake SD-VM-L-MARINDAHL_01	Yankton County	L3	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Immersion Recreation	NA				
				Limited Contact Recreation	NA				
				Warmwater Permanent Fish Life	FULL				
Silver Lake SD-VM-L-SILVER_01	Hutchinson County	L4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	NON	pH (high)			
Swan Lake SD-VM-L-SWAN_01	Turner County	L5	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Lake Thompson SD-VM-L-THOMPSON_01	Kingsbury County	L6	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Whitewood Lake SD-VM-L-WHITEWOOD_01	Kingsbury County	L7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Camp Creek SD-VM-R-CAMP_01	Vermillion River to S6, T99N, R52W	R1	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	INS				
				Warmwater Marginal Fish Life	INS				
Little Vermillion River SD-VM-R-LITTLE_VERMILLION_01_USGS	Near Salem, SD	R2	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Irrigation Waters	FULL				

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Long Creek SD-VM-R-LONG_01	Vermillion River to Highway 44	R3	DENR	Fish/Wildlife Prop, Rec, Stock	INS			5	YES - 1
				Irrigation Waters	INS				
				Limited Contact Recreation	INS-TH	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	INS				
Vermillion River SD-VM-R-VERMILLION_01	Headwaters to Turkey Ridge Creek	R4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Vermillion River SD-VM-R-VERMILLION_02	Turkey Ridge Creek to Baptist Creek	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Vermillion River SD-VM-R-VERMILLION_03	Baptist Creek to mouth	R6	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids	Livestock (Grazing or Feeding Operations) Grazing in Riparian or Shoreline Zones Crop Production (Crop Land or Dry Land)		
East Fork Vermillion River SD-VM-R-VERMILLION_E_FORK_01	McCook/Lake County to Little Vermillion River	R7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Fecal Coliform Oxygen, Dissolved			
				Warmwater Marginal Fish Life	FULL				
East Fork Vermillion River SD-VM-R-VERMILLION_E_FORK_02	Little Vermillion River to mouth	R8	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Marginal Fish Life	FULL				
West Fork Vermillion River SD-VM-R-VERMILLION_WEST_FORK_01_USGS	Vermillion River to McCook-Miner County Line	R9	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	INS-TH	Escherichia coli Fecal Coliform			
				Warmwater Marginal Fish Life	FULL				

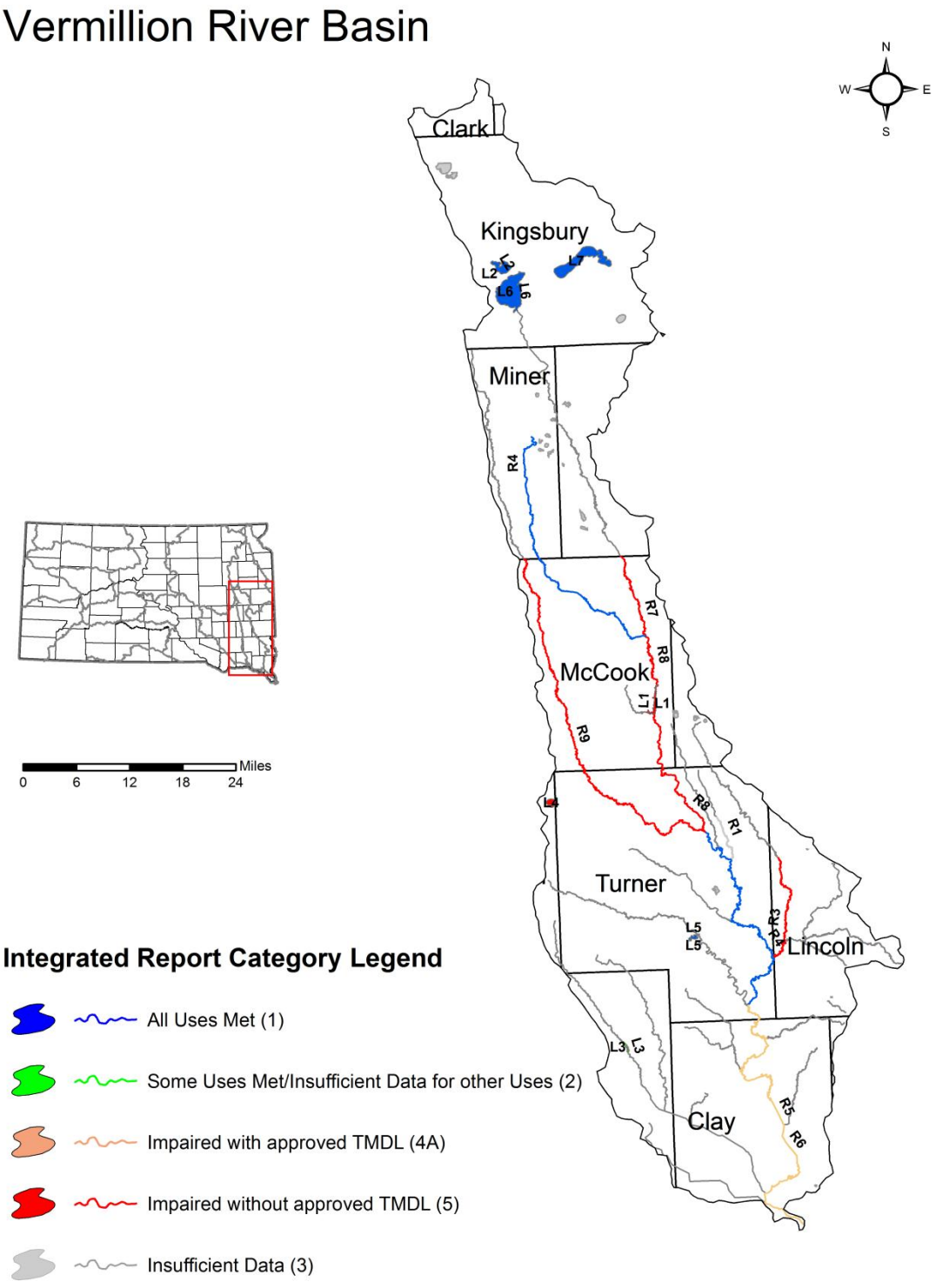


Figure 26: Vermillion River Basin

White River Basin (Figure 27, Table 37)

The White River basin is the most southern of the five major drainages in South Dakota that enters the Missouri River from the west. The total drainage area of the basin in the state is 8,246 square miles. Agriculture dominates the basin's economy, with the majority of the land used as rangeland or cropland.

DENR maintains six water quality monitoring sites within this basin. Four of the six monitoring sites are located on the White River, one is located on Cottonwood Creek, and the other is located on the Little White River.

The USGS has water quality monitoring sites in the basin, including sites on the White River, Little White River, Black Pipe Creek, Lake Creek, Rosebud Creek and others. The data are limited, and the only parameters that were measured were specific conductance and water temperature.

DENR has increased sampling parameters to include uranium, and others associated with uranium mining, at an ambient monitoring location on the White River near Oglala. This location was selected due to in-situ uranium mining upstream in Nebraska and the naturally occurring uranium in the highly erodible soils in the White River basin. Support determinations were based on all parameters; however, there were no surface water quality exceedances for uranium or other parameters associated with uranium mining.

The White River basin receives the majority of the runoff and drainage from the western Badlands. The exposed Badlands are a major natural source of both suspended and dissolved solids to the river. Severe erosion and leaching of soils occurs in the Badlands and throughout the entire length of the basin. Site specific water quality standards for total suspended solids (TSS) were established by DENR in 2009 for the White River and Little White River. The White River is listed as impaired for SAR, fecal coliform, and *E. coli*.

Assessment projects have been completed for the White River, Little White River, and Cottonwood Creek watersheds. There are currently no on-going implementation projects in the White River basin.

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

Table 37: White River Basin Information

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Black Pipe Creek SD-WH-R-BLACKPIPE_01_USGS	S25, T42N, R33W to White River	R1	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL NA FULL			2	NO
Cottonwood Creek SD-WH-R-COTTONWOOD_01	Headwaters to White River	R2	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
Lake Creek SD-WH-R-LAKE_01_USGS	Above and below refuge Near Tuthill, SD	R3	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Warmwater Permanent Fish Life Limited Contact Recreation	FULL FULL FULL NA			1	NO
Little White River SD-WH-R-LITTLE_WHITE_01	Rosebud Creek to mouth	R4	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON FULL	Escherichia coli Fecal Coliform		5	YES - 2
Little White River SD-WH-R-LITTLE_WHITE_02_USGS	S6, T36N, R39W to Rosebud Creek	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NA FULL			2	NO
Omaha Creek SD-WH-R-OMAHA_01_USGS	Headwaters to Little White River	R6	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Rosebud Creek SD-WH-R-ROSEBUD_01_USGS	S34, T38N, R30W to Little White River	R7	USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	INS INS INS NA			3	NO
Sawmill Canyon SD-WH-R-SAWMILL_CANYON_01_USGS	Headwaters to Little White River	R8	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	NA NA			3	NO
White River SD-WH-R-WHITE_01	NE/SD border to Willow Creek	R9	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON FULL	Escherichia coli Fecal Coliform		5	YES - 1

Category (1) All uses met; (2) Some uses met but insufficient data to determine support of other uses; (3) Insufficient data; (4a) Water impaired but has an approved TMDL; (5) Water impaired/requires a TMDL. * Waterbody has an EPA approved TMDL, refer to Appendix A. ^EPA added cause. D**- TMDL development deferred to EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
White River SD-WH-R-WHITE_02	Willow Creek to Pass Creek	R10	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON	 Salinity		5	YES - 1
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform	Wildlife Other than Waterfowl Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	FULL				
White River SD-WH-R-WHITE_03	Pass Creek to Little White River	R11	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	FULL NON NON	 Salinity Escherichia coli Fecal Coliform		5	YES - 1
				Warmwater Semipermanent Fish Life	FULL				
White River SD-WH-R-WHITE_04	Little White River to confluence with Missouri River	R12	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			5	YES - 1
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform	Wildlife Other than Waterfowl Natural Sources Livestock (Grazing or Feeding Operations) Crop Production (Crop Land or Dry Land)		
				Warmwater Semipermanent Fish Life	FULL				
White Clay Creek SD-WH-R-WHITECLAY_01_USGS	White Clay Lake to Oglala Lake	R13	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			2	NO
				Limited Contact Recreation Warmwater Permanent Fish Life	NA FULL				
Williams Creek SD-WH-R-WILLIAMS_01_USGS	headwaters to mouth	R14	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3	NO
Wounded Knee Creek SD-WH-R-WOUNDEDKNEE_01_USGS	Spring Creek to White River	R15	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			2	NO
				Limited Contact Recreation Warmwater Marginal Fish Life	NA FULL				

White River Basin

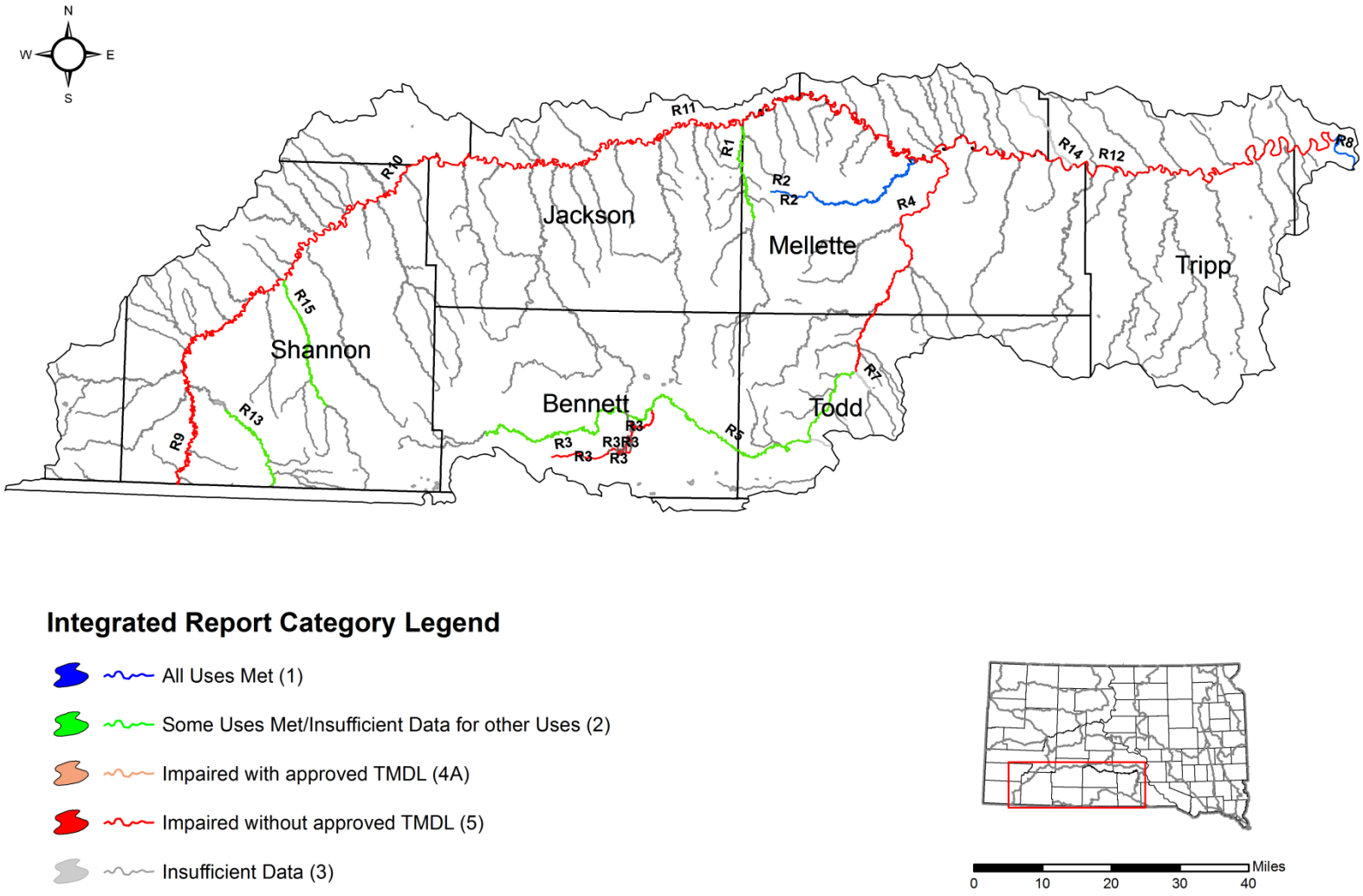


Figure 27: White River Basin

WETLANDS

Wetlands are a common feature in the glaciated prairie pothole region of eastern South Dakota (Figure 28). These systems are commonly considered a nuisance with regards to agricultural production and travel (Johnson and Higgins 1997). Upon settlement (1800s), wetland drainage became a common practice across the glaciated plains of eastern South Dakota. Considerable advances were made in the 1940s and 1950s to drain wetlands for increased agricultural production. Several government agencies, including the United States Department of Agriculture (USDA), once promoted wetland drainage as a responsible land use practice (Johnson and Higgins 1997). As a result, an estimated 35% of the natural wetland area in South Dakota prior to European settlement has been destroyed by human modification (Dahl 1990). Today, federal legislation and other programs have since decreased the rate of natural wetland destruction in South Dakota (Johnson and Higgins 1997).

Figure 28: Map Depicting Prairie Pothole Region

Wetland resources across the prairie pothole region of eastern South Dakota provide many ecological services (Rickerl et al. 2000). Wetlands provide hydrologic services such as water and nutrient storage and flood relief. They also enhance waterfowl production and promote biodiversity. Growing awareness of the importance of wetlands prompted the U.S. Fish and Wildlife Service (USFWS) in 1974 to conduct an inventory of U.S. wetlands, also known as the National Wetlands Inventory. The Cowardin et al. (1982), classification system was adopted by the USFWS to classify wetlands based on hydrologic, geomorphologic, biologic, and chemical characteristics. The National Wetlands Inventory efforts conducted in South Dakota provide documentation regarding identity and extent, characteristics and distribution of wetland resources. In short, eastern South Dakota has an estimated 2.2 million acres of wetlands and deep water habitat. Of this total, an estimated 80.1% or 1.8 million acres are palustrine systems. Palustrine wetlands (prairie potholes) represent small depressional wetlands with shallow water habitat. Johnson and Higgins (1997) summarize results of the latest National Wetlands Inventory survey conducted in eastern South Dakota.

DENR defines wetlands as “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated

soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (ARSD 74:51:01:01(68)). Wetlands are designated the beneficial use of fish and wildlife propagation, recreation and stock watering, which provides protection under existing narrative and numeric water quality standards. The USACE is responsible for the control of activities that place fill in wetlands. The USACE authority stems from Section 404 of the Clean Water Act. For purposes of Federal 404 identification and delineation, wetlands must have each of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes, (2) the substrate is predominantly hydric soil, and (3) the substrate is saturated with water or covered by shallow water at some time during the growing season of each year. Before exercising its authority on a particular action, the USACE issues a public notice, taking into consideration the comments of the EPA, GF&P, DENR, and other resource agencies. Construction projects involving wetlands must receive certification from DENR under Section 401 of the Clean Water Act to certify the action will not violate South Dakota Surface Water Quality Standards. DENR regulates the discharge of pollutants to wetlands under the Surface Water Discharge permitting program.

The USFWS and private entities, such as Ducks Unlimited, work to protect and preserve wetland resources in South Dakota. An estimated 700 US Fish and Wildlife Service Waterfowl Production Areas (WPAs) covering about 183,000 acres of uplands and wetlands were purchased in South Dakota by 1994 (Johnson and Higgins 1997). The USFWS has also obtained easements on an estimated 613,000 acres of eastern South Dakota wetlands through 1994. Approximately 51,000 acres of wetlands are currently owned by GF&P and managed as State Game Production Areas and Public Shooting Areas. Many of these aforementioned entities continue to purchase, obtain easements and manage wetland habitats for the purpose of preservation.

Despite regulatory programs and other protective measures, human impacts on wetland environments (i.e. agriculture) can limit a wetland's ability to provide ecological services. EPA is encouraging states to develop monitoring and assessment tools to determine the ecological integrity of wetland environments. EPA currently promotes three approaches to wetland assessment. A Level-1 assessment is a landscape level screening process using GIS technology and other geo-database information systems to evaluate potential impacts to wetland environments. Level-2 assessments incorporate Level-1 information and rapid, on-site evaluations of wetland attributes for comparison among wetlands. Level-3 assessments require a more rigorous and comprehensive physiochemical and biological assessment of wetland resources.

The Wildlife and Fisheries Department at South Dakota State University, in cooperation with GF&P, developed a Level-1 and Level-2 wetland rapid assessment protocol for prairie pothole wetlands in eastern South Dakota. The assessment method was modified from a protocol developed by the South Florida Water Management District (Miller and Gunsalus 1999) for evaluating wetland condition. The South Dakota wetland rapid assessment protocol was developed for the state's Natural Heritage and Wildlife Habitat Programs (GF&P) for identifying reference wetlands, monitoring randomly selected sites, and evaluating wetland restoration efforts.

A Level-3 wetland assessment was developed within the Prairie Pothole Region of South Dakota. This Level-3 assessment focused on development of an Index of Plant Community Integrity (IPCI) originally developed to assess seasonal wetlands in the Prairie Pothole Region (DeKeyser et al. 2003). The IPCI was modified to evaluate the vegetative composition of wetlands across classification (temporary and semipermanent) and

disturbance (native grass to cropland) gradients within the Northern Glaciated Plains and Northwestern Glaciated Plains ecoregions of South Dakota, North Dakota, and Montana. The IPCI method can be used in South Dakota to allow the placement of wetlands into disturbance classes for ecological and mitigation needs (Hargiss et al. 2007). During the course of the IPIC development in South Dakota, researchers noted that the ecological health of eastern South Dakota prairie pothole wetlands decrease from north to south. This was attributed to greater agricultural intensity in southeast South Dakota (Dekeyser, personal communication).

Wetland drainage using subsurface drain tile is becoming a popular agricultural practice in eastern South Dakota. Agricultural producers are motivated to drain small nuisance wetlands or wet pockets in fields to increase tillable acres due to recent increases in the market value of grain. Producers enrolled in USDA programs are required to gain approval before engaging in wetland drainage practices. Natural Resources Conservation Service offices in eastern counties are currently back-logged with producers waiting for conservationists to make criteria-based wetland determinations which establish a wetland's eligibility for drainage. As more determinations are made, drain tile equipment and tiling crews are becoming a common site in agricultural fields, especially in the eastern tier counties of South Dakota.

Potential environmental impacts associated with wetland drainage have become topics of concern within the natural resource management community. The main concern involves the potential for increased nutrient transport and flow to downstream receiving waters. In addition, the loss of wetland habitat may be detrimental to wildlife, especially waterfowl and other birds that rely on these systems during migration. Because drainage activities primarily focus on small, isolated, non-navigable wetlands, most do not fall under Clean Water Act jurisdiction or any other federal protection. Drainage issues in South Dakota are extensive and therefore managed at the county or township level.

PUBLIC HEALTH/AQUATIC LIFE CONCERNS

The cost of routinely monitoring most toxic pollutants is prohibitive. At present, priority toxins (heavy metals) are routinely monitored at several WQM stream sites located near historic or current mining activities in the northern Black Hills. Ammonia, which is a 307(a) toxic pollutant, is routinely monitored throughout the DENR fixed station monitoring network.

Table 38: Total Size Affected by Toxics

WATERBODY	SIZE MONITORED FOR TOXICS*	SIZE WITH ELEVATED LEVELS OF TOXICS**
Rivers (miles)	6,388	2
Lakes (acres)	136,693	55

* Ammonia, cyanide, chlorine, and/or metals including arsenic.

** Elevated levels are defined as exceedances of state water quality standards, 304(a) criteria, and/or FDA action levels, or levels of concern (where numeric criteria do not exist).

Aquatic Life (Fish Kills)

There were 26 separate aquatic life concern incidents investigated from October 1, 2009, to September 30, 2011. Of these incidents, 10 were the result of a winter kill, 10 were the result of environmental stress and/or infection. The remaining fish kills occurred for a variety of other reasons but mostly due to natural conditions and biological processes during the warm weather months.

The USFWS *Field Manual for the Investigation of Fish Kills* offers the following guide for reporting fish kills:

Minor Kill:	Less than 100 fish
Moderate Kill:	100 to 1,000 fish in 1.6 km of stream or equivalent lentic area.
Major Kill:	More than 1,000 fish in 1.6 km of stream or equivalent lentic area.

By these standards, from October 1, 2009 to September 30, 2011, there were 19 minor fish kills and 7 moderate fish kills in South Dakota.

It is extremely important that the initial phases of an investigation be performed at the earliest indication of a fish kill. The need for such urgency is due to the fact that fish degrade rapidly, and the cause of death may become unidentifiable within a very short time. Unfortunately, DENR is often notified days after an incident has occurred. For this reason, the department is occasionally unable to positively identify the event that caused the fish kill.

DENR reviews the cause(s) of a fish kill, the waterbody's designated beneficial uses, and the water quality sample data to determine impairment. Marginal fisheries may experience frequent fish kills, while semipermanent fisheries may experience occasional fish kills due to natural environmental conditions. DENR would consider a waterbody as impaired due to a fish kill if water quality data suggest that the cause of impairment is related to human influence. However, a waterbody that experiences a fish kill due to a single occurrence spill and has been remediated, will not be listed as impaired.

Table 39: Summary of Fish Kill Investigations

Date Reported	Fish Species	Kill Classification	Waterbody	County	Conclusions/Cause of Fish Kill
10/04/2011	black crappies	minor	Lake Madison	Lake	stress-related
09/27/2011	minnows, sunfish, catfish, bullheads	minor	Strom pond	Lincoln	Ag drain tile and surface runoff enriched with nutrients caused a DO crash.
09/07/2011	Lake Herring	minor	Lake Oahe	Hughes, Sully, Potter	Primary bacteremia, likely caused by environmental stress due to reservoir conditions (Missouri River flooding 2011)
07/07/2011	fathead minnows, age - 0 largemouth bass	moderate	Big Foot Dam	Pennington	Stressed by poor water quality after large storm event
summer 2011	freshwater drum	minor	Mina Lake	Edmunds	unknown
05/04/2011	chinook salmon	minor	Lake Oahe	Hughes, Sully	Severe fungal dermatitis with secondary bacteremia. Likely caused by environmental stress due to reservoir conditions (Missouri River flooding 2011)
winter 2010-2011	all	moderate	Pigors Lake	Brown	winterkill (oxygen depletion)
winter 2010-2011	all	moderate	3rd Ave Pond (Watertown)	Codington	winterkill (oxygen depletion)
winter 2010-2011	all	minor	Faulkton Lake	Faulk	winterkill (oxygen depletion)
winter 2010-2011	all	minor	Cottonwood Slough	Codington	winterkill (oxygen depletion)
winter 2010-2011	all	minor	Round Lake	Deuel	winterkill (oxygen depletion)
08/04/2010	goldfish, sunfish	minor	Galway Retention Pond (stormwater)	Minnehaha	low water levels, stress-related
07/26/2010	black crappies	minor	Lake Carthage	Miner	not investigated, assumed to be stress-related
07/22/2010	carp, walleye, black crappie	moderate	Wall Lake	Minnehaha	High precipitation flushed area wetland water into Wall Lake resulting in high organic and nutrient loading, low DO, and fish mortality.
07/14/2010	black crappies	minor	Lake Henry	Bon Homme	not investigated, assumed to be stress-related
06/27/2010	white & black crappies	moderate	Swan Lake	Turner	After a large precipitation event, the fish were stressed by poor water quality and subsequent parasite infection.
06/15/2010	goldfish, crappie, green sunfish, bullhead	minor	Covell Lake	Minnehaha	Infection due to stress after large storm event
06/07/2010	common carp	minor	An oxbow lake of Big Sioux River	Minnehaha	Poor water quality after large storm event
summer 2010	all	minor	Big Stone Lake	Roberts	summerkill
summer 2010	black crappies	moderate	Richmond Lake	Brown	spawning stress
winter 2009-2010	all	minor	Wolf Slough	Codington	winterkill (oxygen depletion)
winter 2009-2010	all	minor	Cottonwood Lake	Marshall	winterkill (oxygen depletion)
winter 2009-2010	all	moderate	Kampeska Pits (Yohota Pond)	Codington	winterkill (oxygen depletion)
winter 2009-2010	bluegill, largemouth bass	minor	Leola Lake	McPherson	winterkill (oxygen depletion)
winter 2009-2010	all	minor	Still Lake	Codington	winterkill (oxygen depletion)
10/19/2009	brown and rainbow trout	minor	Horsethief Lake	Pennington	Stocked trout were stressed before being released and did not recover.

Unsafe Beaches

Public beach managers were required to collect fecal coliform bacteria samples weekly from public beaches for analysis by an approved or certified laboratory in accordance with Public Beach Standards (SDCL Chapter 74:04:07). All public beaches regulated under Chapter 74:04:08 had to report results of the bacteria samples to the department within 10 days of receiving the results. A public beach was considered out of compliance and required to close based on the following criteria:

74:04:08:07 Water Quality Standards assigned to public beaches
(1) Any three consecutive samples exceed 200 fecal coliform per 100 milliliters;
(2) Any two consecutive samples exceed 300 fecal coliform per 100 milliliters; or
(3) Any single sample exceeds 1,000 fecal coliform per 100 milliliters.

A waterbody is listed as impaired if three beach closures per season occur in a consecutive three-week sampling period. One beach closure occurred during the 2010 recreation season (May 1 to September 30) due to unsafe bacteria levels. The closure occurred at Lake Alvin in Lincoln County in late June 2010. No other beach closures were reported from the approximately 58 designated public beaches throughout South Dakota.

During the 2010 legislative session the legislature passed a bill which removed DENR's authority to regulate public beach closures. Bacteria data collection and decisions related to public swimming beach closures became the responsibility of the particular management agency.

DENR solicits water quality information including beach closure information from federal, state and local natural resource agencies during the department's request for data process. In 2011, no bacteria results or recommended public beach closures were reported. No waterbodies were listed as impaired due to beach closures during this reporting period.

Fish Consumption Advisories

During the years 2010 and 2011, the Surface Water Quality Program, in partnership with the South Dakota Department of Game, Fish, and Parks, and the South Dakota Department of Health sampled and analyzed fish from a variety of waterbodies. DENR has been collecting and actively studying fish flesh contaminant data since 1994. The purpose of this work is to determine the concentration of various contaminants in fish to protect public health.

In 2010 and 2011, fish were collected from a total of 48 different locations:

Table 40: Waterbodies Sampled for Contaminants in Fish

Waterbody	County	Sample Year
Amsden Dam	Day	2011, 2004
Antelope Lake	Day	2011, 2000
Belle Fourche Reservoir (Orman)	Butte	2011, 2006, 1994
Blue Dog Lake	Day	2011, 2000, 1996
Brakke Dam	Lyman	2010, 1998
Brush Lake	Brookings	2011
Burke Lake	Gregory	2011
Cavour Lake	Beadle	2011, 2000
Coal Springs	Perkins	2011, 2003
Curlew Lake	Meade	2011, 2005
Dry Lake #2	Clark	2011, 2001
Enemy Swim Lake	Day	2011, 2007, 2005, 1996
Fate Dam	Lyman	2011, 2005
Horseshoe Lake	Day	2011, 2007, 2004
Lake Byron	Beadle	2011, 2005, 1999
Lake Cochrane	Deuel	2010
Lake Faulkton	Faulk	2010, 1999
Lake Hurley	Potter	2011, 2008, 2005, 2003, 2002
Lake Isabel	Dewey	2010, 2005, 2003, 2002, 1999
Lake Louise	Hand	2011, 2003
Lake Oahe (Cow Creek)	Sully	2011
Lake Oahe (Grand River Embayment)	Corson	2011, 2010, 2001, 1997
Lake Oahe (Minneconjou Bay)	Stanley	2010, 2007, 2002, 2001, 1997
Lake Oahe (Moreau River Embayment)	Dewey	2011, 2001, 1997
Lake Oahe (West Whitlock)	Potter	2011, 2010, 2007, 2002
Lake Poinsett	Hamlin	2011, 2010, 1997
Lake Sharpe (Fort George)	Hughes	2010, 1999
Lake Sharpe (Hipple Lake)	Hughes	2010
Lake Sharpe (Stilling Basin)	Hughes	2010
Lake Sharpe (West Bend)	Hughes	2010, 1999
Little Missouri River	Harding	2011, 2002
McCook Lake	Union	2011, 2005

Waterbody (continued)	County	Sample Year
Mina Lake (Lake Parmley)	Edmunds	2010, 1998
Newell Lake	Butte	2011, 2010, 2004, 2002
Opitz Lake	Day	2011, 2010
Pactola Reservoir	Pennington	2011, 2005, 1994
Reetz Lake	Day	2011, 2001
Reid Lake	Clark	2011, 2001
Roosevelt Lake	Tripp	2011, 2008, 2003, 2002
Rush Lake	Day	2011, 2000
Shadehill Reservoir	Perkins	2011, 2004, 1994
South Buffalo Lake	Marshall	2011
Stockade Lake	Custer	2010, 1998
Twin Lakes	Minnehaha	2011
Twin Lakes/Hwy 81	Kingsbury	2011, 2003, 2002
Waubay Lake	Day	2011, 2008, 2001, 2000, 1999, 1998
Whitewood Lake	Kingsbury	2011
Wilmarth Lake	Aurora	2011, 2005, 2003

Most mercury results are samples collected from individual fish using a nonlethal biopsy punch. PCB and pesticide results are composites of fillets from five fish. Initial fish analysis for each waterbody typically includes the parameters listed below. Following receipt and study of initial data, intensive sampling for specific parameters may be performed. The parameters sampled are listed below.

Table 41: Contaminants Analyzed in Fish Flesh

PCB's	Pesticides		Metals
Aroclor 1016	DDT	DDD	Total Cadmium
Aroclor 1221	DDE	Aldrin	Total Selenium
Aroclor 1232	BHC-alpha	Dieldrin	Total Mercury
Aroclor 1242	BHC-beta	Endosulfan I	
Aroclor 1248	BHC-delta	Endosulfan II	
Aroclor 1254	BHC-gamma	Endosulfan Sulfate	
Aroclor 1260	Heptachlor	Chlordane	
Total PCBs	Heptachlor Epoxide	Toxaphene	
	Hexachlorobenzene	Endrin	
	Methoxychlor	Endrin Aldehyde	

The Food and Drug Administration (FDA) has set 1 ppm (part per million) total mercury as the action level for commercial fish. In South Dakota, the Department of Health is responsible for issuing fish consumption advisories. Please refer to Table 42 for specific fish consumption guidelines.

Table 42: Waterbodies Affected by Fish and Shellfish Consumption Restrictions

Name of Waterbody	Pollutant of Concern	Size Affected (acres)	Type of Fishing Restrictions			
			Non Consumption		Limited Consumption	
			General Population	Sub-Population	General Population	Sub-Population
Bitter Lake (Day)	mercury	3,228	-	-	1	1
Lake Hurley (Potter)	mercury	106	-	-	1	1
Lake Isabel (Dewey)	mercury	113	-	-	1	1
Roosevelt Lake (Tripp)	mercury	93	-	-	1	1
Twin Lakes W. Hwy 81 (Kingsbury)	mercury	303	-	-	1	1
Reid Lake (Clark)	mercury	380	-	-	1	1
Opitz Lake (Day)	mercury	170	-	-	1	1
Coal Springs Reservoir (Perkins)	mercury	91	-	-	1	1
North Island Lake (Minnehaha & McCook)	mercury	375	-	-	1	1
Pudwell Dam (Corson)	mercury	105	-	-	1	1
Newell Lake (Butte)	mercury	154	-	-	1	1
Twin Lakes (Minnehaha)	mercury	287	-	-	1	1
Consumption Guidelines	Adults should eat no more than 7 ounces of fish per week.		Women who plan to become pregnant, are pregnant, or are breast-feeding, should eat no more than 7 ounces per month.		Children under age 7 should eat no more than 4 ounces per month	

Domestic Water Supply Restrictions

There are currently no water consumption restrictions on waterbodies with the domestic water supply beneficial use designation.

Table 43: Waterbodies Affected by Domestic Water Supply Restrictions

Name of Waterbody	Waterbody Type	Type of Restriction			Cause(s) (Pollutant(s)) of Concern	Source(s) of Pollutants
		Closure[a] (Y/N)	Advisory[b] (Y/N)	Other (explain)		
None	-	-	-	-	-	-

[a] Closures restrict all consumption from a domestic water supply.
[b] Advisories require that consumers disinfect water (through boiling or chemical treatment before ingestions).

Table 44: Summary of Waterbodies Not Fully Supporting Domestic Water Supply Use

Waterbodies (List)	Source(s) of Data (√)			Characterization	Cause(s)
	Ambient	Finished	Use Restrictions		
River and Streams					
None	-	-	-	-	-
Lakes and Reservoirs					
None	-	-	-	-	-

Table 45: Summary of Domestic Water Supply Use Assessments for Streams

Total Miles Designated for Domestic Water Supply Use_1,824_ Total Miles Assessed for Domestic Water Supply Use_827_				
Miles Fully Supporting Domestic Water Supply Use	827	% Fully Supporting Domestic Water Supply Use	100%	Causes
Miles Fully Supporting but Vulnerable For Domestic Water Supply Use	-	% Fully Supporting but Vulnerable for Domestic Water Supply Use	-	
Miles Not Supporting Domestic Water Supply Use	-	% Not Supporting Domestic Water Supply Use	0%	-
Total Miles Assessed for Domestic Water Supply Use	827			

Table 46: Summary of Domestic Water Supply Use Assessment for Lakes

Total Waterbody Acreage designated for Domestic Water Supply Use_8,410_ Total Waterbody Acreage Assessed for Domestic Water Supply Use_7,995_				
Acres Fully Supporting Domestic Water Supply Use	7,995	% Fully Supporting Domestic Water Supply Use	100%	Causes
Acres Fully Supporting but Vulnerable For Domestic Water Supply Use	-	% Fully Supporting but Vulnerable for Domestic Water Supply Use	-	
Acres Not Supporting Domestic Water Supply Use	0	% Not Supporting Domestic Water Supply Use	0%	-
Total Acres Assessed for Domestic Water Supply Use	7,995			

IV. POLLUTION CONTROL PROGRAMS

POINT SOURCE POLLUTION CONTROL PROGRAM

The state received delegation of the federal National Pollutant Discharge Elimination System (NPDES) program from the United States Environmental Protection Agency (EPA) on December 30, 1993. The NPDES permits issued by the state are referred to as Surface Water Discharge (SWD) permits. EPA continues to issue NPDES permits in South Dakota for facilities over which they retained jurisdiction. As of September 30, 2011, the state has issued a total of 273 individual SWD permits in South Dakota. In addition, DENR has issued coverage to 2,563 facilities under General Storm Water permits, 315 facilities under Multi-Media General permits (Storm Water & Air Quality), and 600 facilities under other General permits. DENR has also issued 24 biosolids-only permits.

Technology-based controls are placed in most SWD and NPDES permits. However, technology-based controls alone do not necessarily protect waters of the state from toxic pollutants. Therefore, water quality-based limits and toxicity testing requirements are also placed in many of the permits.

Water quality-based limits are developed when technology-based limits alone are not adequate to protect the beneficial uses of the receiving stream. In these cases, the state develops water quality-based effluent limits to ensure the surface water quality standards are met and maintained.

The state continues to require whole effluent toxicity testing for all major SWD permittees and certain significant minors. The goal of the whole effluent toxicity approach is to ensure that point source discharges do not contain toxics in toxic amounts. If toxicity is found, the discharger is required to conduct an evaluation of the discharge to determine the source of the toxicity and eliminate the toxicity.

The South Dakota Surface Water Quality Standards contain the following provision concerning discharges to lakes:

> ***ARSD 74:51:01:27. Lakes not allowed a zone of mixing.*** *No zone of mixing is allowed for lakes. Discharges to lakes must meet the water quality standards at the point of discharge. No discharge of pollutants is allowed which reaches a lake classified for the beneficial use of coldwater permanent, coldwater marginal, warmwater permanent, warmwater semipermanent, or warmwater marginal fish life propagation or causes impairment of an assigned beneficial use.*

DENR's Surface Water Discharge permitting program regulates the discharge of pollutants from point sources. In most cases, DENR has not allowed discharges to lakes classified for the fish life propagation uses outlined in ARSD 74:51:01:27. There have been only limited exceptions to this provision.

Many of South Dakota's streams eventually drain into classified lakes. If a point source discharges into a tributary of a lake, DENR takes into account the distance from the lake and the natural attenuation of any pollutants present before the discharge is permitted. During the reissuance of each of these permits, DENR re-evaluates these discharges. If DENR determines that a discharge has a potential to impact a classified lake, DENR has required the point source

to cease its discharge to the classified lake. DENR has permitted discharges of uncontaminated water to lakes (i.e. non-contact cooling water).

To date, this approach has protected South Dakota's lakes and has not caused or contributed to a violation of the surface water quality standards from a point source discharge.

To help ensure that wastewater collection and treatment systems in the state are in compliance, the department provides cost share funding for their planning, design, and construction. The department administers the Clean Water State Revolving Fund (CWSRF) Loan Program which provides low interest loans to publicly owned wastewater facilities. The department's CWSRF Intended Use Plan establishes the criteria the department uses for fund awards. The Intended Use Plan can be accessed at:

http://denr.sd.gov/dfta/wwf/dwsrf/09DWSRFIUP.pdf

Between October 1, 2009, and September 30, 2011, the department's Board of Water and Natural Resources awarded 40 CWSRF loans totaling $68,031,930. Portions of sixteen of the awards were provided as additional subsidy in the form of principal forgiveness. The principal forgiveness totaled $15,257,265. These funds were used for the design and construction of sanitary sewer collection systems, wastewater treatment facilities, storm sewers, and nonpoint source implementation Best Management Practices (BMPs).

The current CWSRF interest rates are 2.25% for loans with a term of 10 years or less, 3.0% for loans with a term greater than 10 years up to 20 years, and 3.25% for loans with a term greater than 20 years up to a maximum of 30 years. There is also a nonpoint source incentive loan rate for communities that are sponsoring a nonpoint source implementation project. The loan rate for these projects ranges from 1.25% for up to 10 years and 2.0% for up to 20 years.

CWSRF administrative surcharge fees have been used to provide grant assistance for various clean water activities. To encourage responsible and proactive engineering planning, the Board uses CWSRF administrative surcharge funds to cost share engineering planning studies for small communities (2,500 population and below). Between October 1, 2009, and September 30, 2011, the department awarded a total of $292,296 for 40 engineering studies. Additionally, $75,000 was awarded for a Sioux Falls sewer regionalization study, and $468,160 was awarded to conduct energy audits of sixteen mechanical wastewater treatment facilities. The Board awarded $1,080,000 for the construction of 3 wastewater improvement projects and $86,000 for a nonpoint source implementation project.

South Dakota has a state water planning process that was established in 1972. This establishes an orderly planning process for water development. In addition, the state established a dedicated water funding program in 1993. The dedicated funding sources provide approximately $8.5 million annually. Between October 1, 2009, and September 30, 2011, $6,498,815 in state grants was awarded to 24 wastewater collection or treatment and storm water projects. Additionally, a $130,000 state grant was awarded to provide nonfederal cost share for a section 319 nonpoint source implementation project.

COST/BENEFIT ASSESSMENT

DENR provides the Governor and Legislature with annual reports summarizing water and wastewater development activities for the preceding calendar year. The 2010 and 2011 annual reports can be accessed at:

http://denr.sd.gov/documents.aspx#Funding

Information on operation and maintenance costs for local units of government is not readily available. Not all benefit data are readily available, but some information has been included in the Statewide Surface Water Quality Summary section of this report.

NONPOINT SOURCE POLLUTION CONTROL PROGRAM

South Dakota's nonpoint source pollution management activities are implemented through the South Dakota Nonpoint Source Pollution Management Program. The primary focus of the program is the control of nonpoint source pollution through the use of voluntary implementation of best management practices (BMPs) and holistic resource management plans. The major sources of NPS pollution in South Dakota are summarized in Table 47.

The program coordinates its NPS control activities with local, state, and federal agencies and stakeholder organizations. These agencies and organizations provide BMPs and financial and technical assistance that increase the program's capacity to develop and implement NPS management projects.

The remainder of this section provides a summary that describes the South Dakota Nonpoint Source Pollution Management Program and the types of NPS projects that are being developed and implemented. Additional information concerning the program and projects may be obtained by consulting the South Dakota Nonpoint Source Management Program Plan and annual reports. Copies of these documents are available from the DENR, the South Dakota State Library, or by visiting:

http://denr.sd.gov/dfta/wp/wp.aspx

South Dakota Nonpoint Source Management Program

The South Dakota Nonpoint Source Pollution Management Program is housed in the DENR Water Resources Assistance Program (WRAP). NPS pollution activities completed by program staff are selected to improve, restore, and maintain the water quality of the state's lakes, streams wetlands, and ground water in partnership with other agencies, organizations, and citizen groups.

Implementation of the NPS Pollution Management Program is guided by the South Dakota Nonpoint Source Management Plan. The most recent revision of South Dakota's NPS Management Plan was submitted to EPA in December 2007. The NPS Management Plan:

- addresses the nine mandated elements required to access Section 319 incremental funds;
- expands on activities included in previous editions of the plan; and
- continues to achieve improved water quality through voluntary actions developed in partnership with the landowners and managers.

The primary tools selected to accomplish the tasks outlined in the plan include:

- technical and financial assistance delivered through program staff and project partnerships; and
- a comprehensive information and education effort.

A copy of the management plan is available upon request or by visiting:

http://denr.sd.gov/dfta/wp/documents/npsmgmtplan07.pdf

A key element in implementing the South Dakota NPS Management Plan is the South Dakota Nonpoint Source Task Force. The task force is a citizen's advisory group composed of approximately 30 agencies, organizations, and tribal representatives. The task force:

- provides a forum for the exchange of information on activities that impact nonpoint source pollution control;
- prioritizes waterbodies for NPS control activities;
- provides guidance and application procedures for funding NPS control projects;
- reviews project applications;
- recommends projects to the South Dakota Board of Water and Natural Resources for funding approval;
- serves as the coordinating body for the review and direction of federal, state, and local government programs to ensure that the programs will achieve NPS pollution control efficiently;
- serves as a focal point for the information, education, and public awareness regarding NPS pollution control;
- provides oversight of NPS control activities and prioritize the activities; and
- provides a forum for discussion and resolution of program conflicts.

For additional information about the task force visit:

http://denr.sd.gov/dfta/wp/npstf.aspx

South Dakota Nonpoint Source Projects

Since the reauthorization of the Clean Water Act in 1987, the South Dakota NPS Pollution Management Program has used Section 319, 104(b)(3), 106, 604(b), Pollution Prevention, and state and local funding to support more than 265 NPS projects. During 2011, there were approximately 20 active NPS projects. The total includes four watershed assessments/total maximum daily load (TMDL) developments, 12 watershed/TMDL implementations, two statewide BMP planning technical assistance projects, one BMP research project, and one information and education project. The technical assistance projects provide watershed and TMDL development project sponsors with technical assistance for planning and arranging funding for livestock feeding and riparian management and other sediment and nutrient reduction BMP installation. In addition, TMDL development efforts not specifically associated with the aforementioned NPS sponsored projects are conducted by DENR program staff.

A list of the projects funded is contained in the South Dakota Nonpoint Source Management Program Annual Report. A copy of the report may be obtained from the South Dakota Department of Environment and Natural Resources, the South Dakota State Library, or by visiting:

http://denr.sd.gov/dfta/wp/npsannualreports.aspx

Project implementation plans, reports of project progress/results, and final reports for completed projects are available on the EPA Grants Reporting and Tracking System. Copies of final reports are also available by contacting DENR or the South Dakota State Library. Electronic copies of the final report for many of the more recently completed projects are available on the State Library web site or by visiting:

http://denr.sd.gov/dfta/wp/wqinfo.aspx#Project

While the size, target audience, and structure of the projects vary; all share common elements:

- increase awareness of NPS pollution issues;
- identify, quantify, and locate sources of nonpoint source impairment;
- reduce or prevent the delivery of NPS pollutants to waters of the state with emphasis on meeting targets established through total maximum daily loads (TMDLs), and disseminate information about effective solutions to NPS pollution.

Although most of the projects fit into one of the following three categories: assessment/development, information and education, watershed implementation, most include components of each category.

A portion of the Section 319 funds awarded to the state has also been used to assess major aquifers in the state and promote and implement practices that prevent ground water contamination.

Historically, the majority of the projects developed and implemented focused on reducing NPS pollution originating from agricultural operation. More recently, increased resources have been directed toward local initiatives that:

- evaluate water quality conditions;
- determine sources and causes of NPS pollution within priority watersheds; and
- develop and implement total maximum daily loads (TMDLs) for impaired waterbodies.

Waterbodies assessed are selected from those on the 303(d) list of impaired waterbodies. Activities included in implementation project work plans are selected to reach the TMDLs developed as part of the assessment process.

TMDLs are prepared as a part of an assessment project. Activities completed during an assessment project include an inventory of existing data and information and supplemental monitoring, as needed, to allow an accurate assessment of the watershed. Through these efforts, local project sponsors are able to:

- determine the extent to which beneficial uses are impaired;
- identify specific sources and causes of the impairments;
- establish preliminary pollutant reduction goals or TMDL endpoints; and
- identify management practices and alternatives that will reduce the pollution at its source(s) and restore or maintain the beneficial uses of the waterbody.

The project period for assessment/development projects generally ranges from one to three years.

Information and education projects are designed to provide information about NPS pollution issues and solutions. Information transfer tools typically used by the department and its project partners include brochures, print and electronic media, workshops, BMP implementation manuals, tours, exhibits, and demonstrations. Information and education projects usually range from one to five years in length. During recent years the NPS Program has:

- focused a portion of its information and education efforts on the development of BMPs to improve management of nutrients originating from livestock operations through a partnership with the academic community; and
- formed a partnership with the South Dakota Discovery Center for the implementation of the statewide information and education efforts that target a wider cross section of the state's population.

Watershed projects are the most comprehensive type of project implemented through the South Dakota NPS Pollution Management Program. Watershed projects are typically long term in duration and designed to implement TMDLs that address NPS pollution sources and beneficial use impairments identified during the completion of an assessment project. Common watershed project objectives include:

- protect/restore impaired beneficial uses through the promotion and voluntary implementation of best management practices (BMPs) that prevent/reduce NPS pollution;
- disseminate information about NPS pollution and effective solutions; and
- evaluate project progress toward use attainment or NPS pollutant reduction goals.

Watershed projects typically range from four to ten years in length with the duration being dependent on the size of the watershed and extent of the NPS pollution impacts that must be addressed.

Nonpoint Source Pollution Control Program Funding Strategy

DENR receives approximately $3.0 million Section 319 funds annually from EPA. Administrative costs total about $680,000. The remaining $2.3 million is made available for project awards. DENR attempts to package the funding for TMDL assessment and implementation projects using a variety of other department, state, federal, or private funding.

Other department funds used for cost share include department fee funds, 604(b) funds, 106 funds, dedicated water development funding, Clean Water SRF administrative surcharge funds, and Clean Water SRF conventional loan funds.

State financial resources from other programs commonly used in implementing NPS projects include the Department of Agriculture's Soil and Water Conservation Grant funds, Game, Fish & Parks funds, and Water Development District funds. Private funds include Ducks Unlimited and Izaac Walton League.

For many TMDL assessment and implementation projects, DENR attempts to fund about half of the 40% nonfederal share needed to match the Section 319 funds.

Other federal funding sources commonly used in completing NPS projects include U.S. Bureau of Reclamation funds (or services), U.S. Department of Agriculture's Environmental Quality Incentive Program, Wildlife Habitat Incentives, Wetlands Reserve, Grasslands Reserve and Conservation Reserve Programs; and EPA Pollution Prevention Program Grants. Local project partners are also encouraged to apply for EPA Region VIII Consolidated Funding Process and Information and Education Grant Program funds.

DENR is on schedule to complete the TMDL assessments for those waterbodies on the 1998, 2002, 2004, 2006, 2008, and 2010 303(d) lists. The department typically moves completed TMDLs to implementation within a year after completion.

The implementation projects can be expensive. To ensure that timely progress is made, DENR typically awards funds for an initial two to three year implementation project. A second segment is funded only if sufficient progress is made during the first phase.

Implementation projects funded are typically designed to implement multiple TMDLs in a geographic or river basin area. This practice increases efficiency in the use of limited financial resources and provides the local sponsor and its partners with the opportunity to hire a more highly skilled project staff.

TMDL assessments in eastern South Dakota indicate bacteria and TSS reductions may be achieved through the implementation of a suite of BMPs. DENR limits Section 319 funding primarily to riparian area restoration, shoreline stabilization, livestock exclusion, and installation of animal waste systems for small animal feeding operations. The department's project partners are urged to seek funding for other BMPs from the Environmental Quality Incentive Program and other state and federal programs.

Implementation projects typically begin at about $200,000 and can run as high as several million dollars. The cost depends on the size of the watershed and the estimated number and types of BMPs needed to attain the project TMDL goal(s).

For information about specific South Dakota NPS projects funded using Clean Water Act Section 319 funds, contact DENR, or access EPA's Nonpoint Source Grants Reporting and Tracking System database.

Table 47: South Dakota Categories and Subcategories of NPS Pollution Sources

Agriculture	Resource Extraction/Exploration/Development
Crop Production	Surface Mining (historic)
Pasture grazing-riparian and upland	Subsurface Mining
Animal feeding operations	Petroleum activities
Rangeland – riparian and upland	Acid mine drainage
Silviculture	**Habitat Modification**
Harvesting, restoration, residue management	Removal of riparian vegetation
Forest management	Drainage/filling of wetlands
Logging road construction/maintenance	Streambank modification/destabilization
Bank or shoreline modification/destabilization	
Construction Runoff	**Urban Runoff**
<1 acre highway/road/bridge construction projects	Surface Runoff
Land development	Highway/road/bridge runoff
Channelization	
Other	
Dam construction	
Golf courses	
Atmospheric deposition	
Waste storage/storage tank leaks	
Spills	
Erosion and sedimentation	
Drought-related impacts	
Natural Sources	

Future Nonpoint Source Program Directions

NPS pollution originates from diverse sources. Nonpoint source pollution controls must reflect this by using all of the resources available from the various state, federal, and local organizations and in addition, have landowner support and participation. The technical and financial assistance currently available is not sufficient to solve all of the NPS pollution problems in the state. Additional solutions must be attempted. Landowners have the capability to accomplish much if they understand the problems and the ways to solve them. Educating the public about NPS pollution issues may prompt landowners to voluntarily implement activities to control NPS pollution. New federal programs must also be developed to supplement existing programs. The continuation of existing activities coupled with the addition of innovative new programs will ensure that South Dakota remains a leader in nonpoint source pollution control. Figure 29 depicts the status of TMDL assessment and implementation projects within South Dakota.

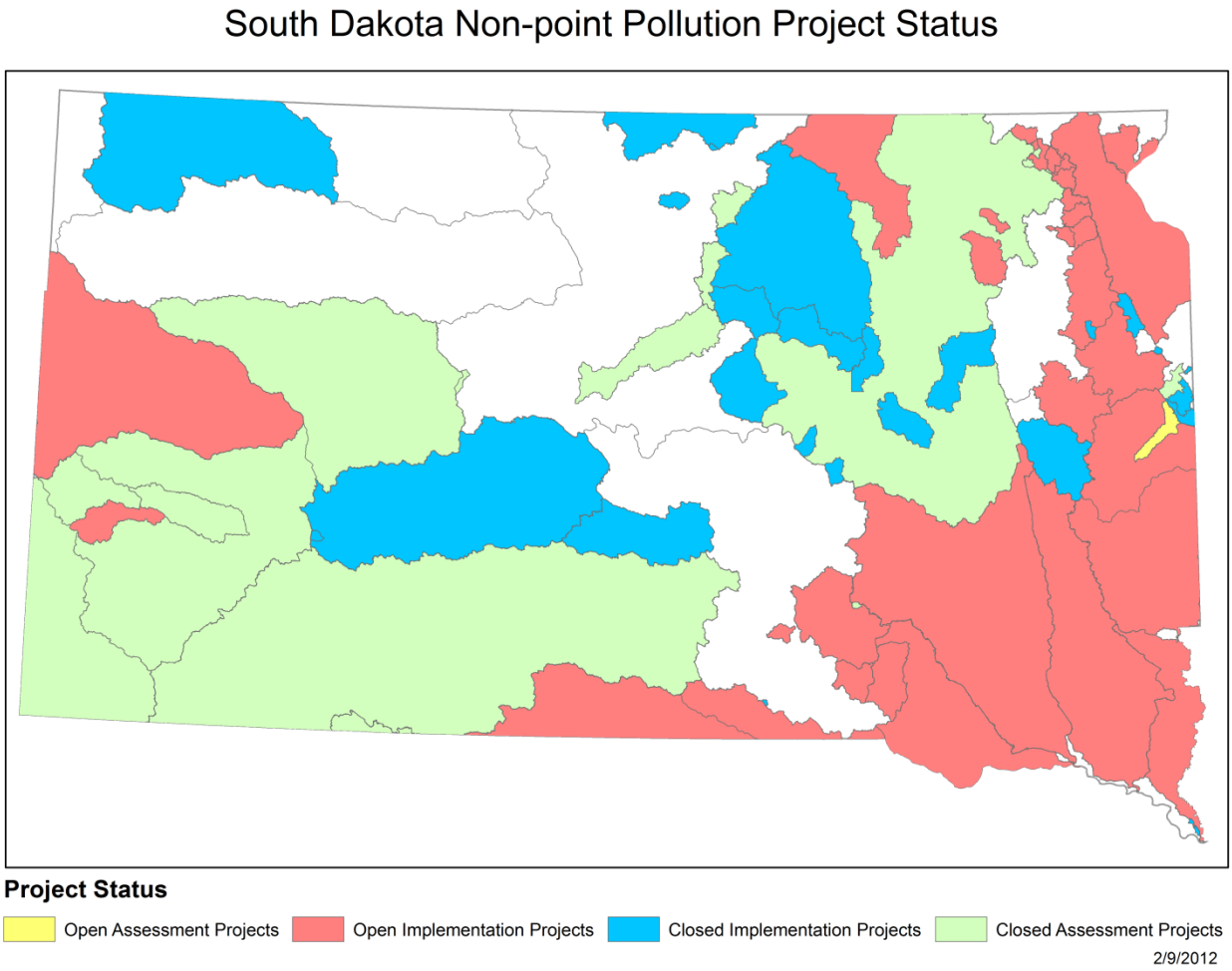


Figure 29: Status of TMDL Assessment/Implementation Projects

V. PUBLIC PARTICIPATION PROCESS

To fulfill the requirements of the federal Clean Water Act and involve the affected community and stakeholders in the water quality improvement process, a public participation process is implemented. Summarized below are the procedures employed by DENR to involve the public and affected parties.

Process Description

First Public Review/Input Period
An ad is published in approximately ten statewide daily newspapers, announcing DENR is developing the Integrated Report and requesting water quality data that will aid in the assessment of South Dakota's waters. This announcement is also sent to approximately 120 individuals and organizations.

Second Public Review Period
Data received after the first public review period and additional data gathered by DENR are reviewed and a draft Integrated Report is developed. The draft report is released for a 30-day public review and comment period. The announcement on the availability of the draft report is again published in the ten daily newspapers. The draft report is also made available on DENR's web page at: http://denr.sd.gov/documents/12irdraft.pdf. At this time, the draft list is also provided to EPA Region VIII for review and comment.

Personnel from DENR respond to inquiries and are available to meet with interested groups about the list and listing process. Copies of public participation documents and responses to oral and written comments received during the comment period are included in Appendix E.

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VII. KEY TO ABBREVIATIONS

ADB – EPA's Assessment Database (used for Integrated Report development)
AnnAGNPS – agricultural nonpoint source computer model
ARSD – Administrative Rules of South Dakota
BMP – best management practice
CWSRF – Clean Water State Revolving Fund
DENR – South Dakota Department of Environment and Natural Resources
DO – dissolved oxygen
EPA – Environmental Protection Agency
E. coli - *Escherichia coli*
GF&P – South Dakota Department of Game, Fish and Parks
IPCI – Index of Plant Community Integrity
NPDES – National Pollutant Discharge Elimination System
NPS – Nonpoint Source
QA/QC – quality assurance/quality control
SAR – Sodium adsorption ratio
SDCL – South Dakota Codified Law
WQS – South Dakota Surface Water Quality Standards
STORET – EPA computer data storage and retrieval system
SWD – Surface Water Discharge
SWLA – Statewide Lakes Assessments
TDS – total dissolved solids
TMDL – Total Maximum Daily Load
TSI – Carlson's (1997) Trophic State Indices
TSS – total suspended solids
USACE – United States Army Corp of Engineers
USDA – United States Department of Agriculture
USGS – United States Geological Survey
WQM – ambient water quality monitoring
WRAP – Water Resources Assistance Program
USFWS – United States Fish and Wildlife Service

APPENDICES

APPENDIX A

WATERBODIES WITH EPA APPROVED TMDLS

River Basin	Waterbody	Segment or Lake Location	Impairment	TMDL Approved
Bad	Freeman Lake	Jackson County	Nitrates/Selenium	2/7/01
Bad	Hayes Lake	Stanley County	TSI	9/29/04
Bad	Bad River	Stanley County line to mouth	TSS	2/7/01
Belle Fourche	Bear Butte Cr.	Strawberry Cr. To near Bear Den Mountain	TSS	8/8/07
Belle Fourche	Belle Fourche River	Wyoming to Redwater River	Fecal	10/17/11
Belle Fourche	Belle Fourche River	Wyoming to near Fruitdale	TSS	2/2/05
Belle Fourche	Belle Fourche River	Near Fruitdale to Whitewood Creek	TSS	2/2/05
Belle Fourche	Belle Fourche River	Whitewood Creek to Willow Creek	TSS	2/2/05
Belle Fourche	Belle Fourche River	Willow Creek to Alkali Creek	TSS	2/2/05
Belle Fourche	Belle Fourche River	Alkali Creek to mouth	*E. coli*/Fecal	10/17/11
Belle Fourche	Belle Fourche River	Alkali Creek to mouth	TSS	2/2/05
Belle Fourche	Horse Creek	Indian Creek to mouth	TSS	2/2/05
Belle Fourche	Strawberry Creek	Bear Butte Creek to S5, T4N, R4E	Cadmium	4/19/10
Belle Fourche	West Strawberry Creek	Headwaters to mouth	Fecal	4/6/11
Belle Fourche	Whitewood Creek	Deadwood Creek to Spruce Gulch	*E. coli*/Fecal	7/28/11
Big Sioux	Lake Alvin	Lincoln County	TSI/Fecal	11/9/01
Big Sioux	Blue Dog Lake	Day County	TSI/Fecal	2/7/01
Big Sioux	Brant Lake	Lake County	TSI	4/12/99
Big Sioux	Clear Lake	Deuel County	TSI/Sediment	2/7/01
Big Sioux	East Oakwood Lake	Brookings County	TSI/pH	6/13/08
Big Sioux	Lake Herman	Lake County	TSI	9/29/04
Big Sioux	Lake Madison	Lake County	TSI/fish kill	4/12/99
Big Sioux	Lake Kampeska	Codington County	Nutrients/Sediment -special approval	12/26/96
Big Sioux	Pelican Lake	Codington County	Nutrients/Sediment -special approval	12/26/96
Big Sioux	School Lake	Deuel County	TSI	9/2/08
Big Sioux	West Oakwood Lake	Brookings County	TSI	6/13/08
Big Sioux	Lake Poinsett	Hamlin County	Nutrients-special approval	11/26/96
Big Sioux	Beaver Creek	Split Rock Creek to SD-MN border	Fecal/TSS	5/28/08
Big Sioux	Beaver Creek	Big Sioux River to S9, T98N, R49W	Fecal	8/10/11
Big Sioux	Big Sioux River	Willow Creek to Stray Horse Creek	Fecal	6/4/08
Big Sioux	Big Sioux River	Willow Creek to Stray Horse Creek	*E. coli*	8/8/11
Big Sioux	Big Sioux River	I-29 to near Dell Rapids	TSS	5/28/08
Big Sioux	Big Sioux River	Near Dell Rapids to Below Baltic	Fecal	5/28/08

River Basin	Waterbody	Segment or Lake Location	Impairment	TMDL Approved
Big Sioux	Big Sioux River	Above Brandon to Nine Mile Creek	Fecal	1/23/08
Big Sioux	Big Sioux River	Nine Mile Creek to near Fairview	*E. coli*/Fecal	1/23/08
Big Sioux	Big Sioux River	Fairview to near Alcester	*E. coli*/Fecal	1/23/08
Big Sioux	Big Sioux River	Fairview to near Alcester	TSS	2/1/10
Big Sioux	Big Sioux River	Near Alcester to Indian Creek	*E. coli*/Fecal	1/23/08
Big Sioux	Big Sioux River	Near Alcester to Indian Creek	TSS	2/1/10
Big Sioux	Big Sioux River	Indian Creek to Mouth	*E. coli*/Fecal	1/23/08
Big Sioux	Big Sioux River	Indian Creek to Mouth	TSS	1/23/08
Big Sioux	Brule Creek	Big Sioux River to confluence with its east and west forks	Fecal	6/2/11
Big Sioux	East Brule Creek	Confluence with Brule Creek to S3, T95N, R49W	Fecal	3/24/11
Big Sioux	Flandreau Creek	Big Sioux River to MN border	Fecal	5/28/08
Big Sioux	Hidewood Creek	Big Sioux River to US Hwy 77	Fecal	6/4/08
Big Sioux	Jack Moore Creek	Big Sioux River to S33, T 107N, R 49W	Fecal	5/28/08
Big Sioux	North Deer Creek	Six Mile Creek to US Hwy 77	Fecal	5/28/08
Big Sioux	Peg Munky Run	Big Sioux River to S17, T113N, R50W	Fecal	8/10/11
Big Sioux	Pipestone Creek	Split Rock Creek to MN border	Fecal	5/28/08
Big Sioux	Skunk Creek	Brandt Lake to mouth	Fecal	5/28/08
Big Sioux	Split Rock Creek	At Corson, SD	TSS/Fecal	5/28/08
Big Sioux	Spring Creek	Big Sioux River to S22, T109N, R47W	Fecal	5/28/08
Big Sioux	Stray Horse Creek	Big Sioux River to S26, T116N, R51W	Fecal	6/4/08
Big Sioux	Willow Creek	Big Sioux River to S7, T117N, R50W	Fecal	6/4/08
Big Sioux	Union Creek	Big Sioux River to confluence with east and west forks	Fecal	8/8/11
Cheyenne	Center Lake	Custer County	pH	3/24/11
Cheyenne	Center Lake	Custer County	TSI	8/8/07
Cheyenne	Horsethief Lake	Pennington	pH	3/24/11
Cheyenne	Legion Lake	Custer County	pH	3/24/11
Cheyenne	Legion Lake	Custer County	TSI	9/2/08
Cheyenne	Sheridan Lake	Pennington County	TSI	8/30/06
Cheyenne	Sylvan Lake	Custer County	TSI	9/1/05
Cheyenne	Beaver Creek	Wyoming border to Cheyenne River	Fecal	3/12/10
Cheyenne	Cheyenne River	Fall River to Cedar Creek	*E. coli*/Fecal	9/28/10
Cheyenne	Cheyenne River	Cedar Creek to Belle Fourche River	*E. coli*/Fecal	9/28/10
Cheyenne	Cheyenne River	Belle Fourche River to Bull Creek	*E. coli*/Fecal	9/28/10
Cheyenne	Cheyenne River	Bull Creek to Lake Oahe	*E. coli*/Fecal	9/28/10
Cheyenne	Rapid Creek	Canyon Lake to S15, T1N, R8E	Fecal	9/28/10
Cheyenne	Rapid Creek	S15, T1N, R8E to above Farmingdale	*E. coli*/Fecal	9/28/10
Cheyenne	Rapid Creek	Above Farmingdale to Cheyenne River	*E. coli*/Fecal	9/28/10

River Basin	Waterbody	Segment or Lake Location	Impairment	TMDL Approved
Cheyenne	Rapid Creek	Above Farmingdale to Cheyenne River	TSS	9/27/11
Cheyenne	Spring Creek	Headwaters to Sheridan Lake	Fecal	12/11/08
James	Cottonwood Lake	Spink County	TSI	11/9/01
James	Cresbard Lake	Faulk County	TSI	12/3/03
James	Elm Lake	Brown County	TSI	4/12/99
James	Lake Faulkton	Faulk County	TSI/Sediment	4/12/99
James	Lake Hanson	Hanson County	TSI	6/3/04
James	Jones Lake	Hand County	TSI	4/2/03
James	Lake Louise	Hand County	TSI	11/9/01
James	Loyalton Dam	Edmunds County	TSI	4/2/03
James	Mina Lake	Edmunds County	TSI	4/2/03
James	Dawson Creek	James River to Lake Henry	*E. coli*/Fecal	6/2/11
James	James River	Yankton County line to mouth	Fecal	3/24/11
James	Wolf Creek	Just above Wolf Creek Colony to mouth	TSS	8/8/11
James	Moccasin Creek	Aberdeen to Warner	Ammonia	3/19/01
James	Ravine Lake	Beadle County	TSI/Fecal	4/12/99
James	Richmond Lake	Brown County	TSI	8/8/07
James	Rose Hill Lake	Hand County	TSI	4/2/03
James	Lake Byron	Beadle County	Nutrients/Sediment -special approval	4/12/99
James	Lake Mitchell	Davison County	Nutrients-special approval	4/22/97
James	Lake Redfield	Spink County	Nutrients/Sediment -special approval	4/12/99
James	Firesteel Creek	West Fork Firesteel to mouth	Nutrients-special approval	4/22/97
James	Pierre Creek	James River to S11, T102N, R58W	Fecal	9/29/09
Minnesota	Lake Alice	Deuel County	TSI	6/3/04
Minnesota	Fish Lake	Deuel County	TSI	9/29/04
Minnesota	Lake Hendricks	Brookings County	TSI/Sediment	4/12/99
Minnesota	Lake Oliver	Deuel County	TSI	11/9/01
Minnesota	Punished Woman Lake	Codington County	TSI/Sediment	2/7/01
Minnesota	Big Stone Lake	Roberts County	Nutrients-special approval	12/26/96
Missouri	Brakke Dam	Lyman County	TSI	9/29/04
Missouri	Burke Lake	Gregory County	DO/pH/TSI	8/8/07
Missouri	Byre Lake	Lyman County	TSI	6/3/04
Missouri	Corsica Lake	Douglas County	TSI	8/30/06
Missouri	Dante Lake	Charles Mix County	TSI/DO	9/27/06
Missouri	Geddes Lake	Charles Mix County	TSI/DO	5/6/08
Missouri	Fate Dam	Lyman County	TSI	1/14/05
Missouri	Hiddenwood Lake	Walworth County	TSI/Sediment	4/12/99
Missouri	McCook Lake	Union County	TSI	4/12/99
Missouri	Choteau Creek	Lewis & Clark Lake to S34, T96N, R63W	TSS	5/3/10
Missouri	Emanuel Creek	Lewis and Clark Lake to S20, T94N, R60W	*E. coli*	8/10/11
Missouri	Emanuel Creek	Lewis and Clark Lake to S20, T94N, R60W	Fecal/TSS	9/29/09
Missouri	Medicine Creek	US Hwy 83 to mouth	Fecal/TSS	8/30/06

River Basin	Waterbody	Segment or Lake Location	Impairment	TMDL Approved
Missouri	Ponca Creek	SD/NE border to US Hwy 183	Fecal	8/2/10
Missouri	Ponca Creek	SD/NE border to US Hwy 183	TSS	4/27/10
Missouri	Missouri River (Sharpe)	Oahe Dam to Big Bend Dam	Sediment	2/7/01
Niobrara	Keya Paha River	Keya Paha to NE border	*E. coli*	9/22/11
Niobrara	Keya Paha River	Keya Paha to NE border	TSS	9/29/09
Niobrara	Keya Paha River	Keya Paha to NE border	Fecal	2/1/10
Red River	White Lake	Marshall County	DO/TSI	8/20/06
Vermillion	Swan Lake	Turner County	TSI/Sediment	4/12/99
Vermillion	Vermillion River	Turkey Ridge Creek to Baptist Creek	TSS	9/27/10
Vermillion	Vermillion River	Baptist Creek to mouth	TSS	7/511
Vermillion	Turkey Ridge Creek	Vermillion River to S31, T98N, R53W	Fecal	9/27/06

APPENDIX B

DENR 2012 WATERBODY DELISTING REPORT

AUID	WATER_NAME	LOCATION	2012 Category	CAUSE_NAME	DELISTING_REASON_DESC
SD-BF-R-BELLE_FOURCHE_01	Belle Fourche River	Wyoming border to Redwater River	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-BF-R-BELLE_FOURCHE_05	Belle Fourche River	Alkali Creek to mouth	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-BF-R-HORSE_01_USGS	Horse Creek	Indian Creek to mouth	2	Specific Conductance	Applicable WQS attained; reason for recovery unspecified
SD-BF-R-STRAWBERRY_01	Strawberry Creek	Bear Butte Creek to S5, T4N, R4E	4a	Cadmium	TMDL approved or established by EPA (4A)
SD-BF-R-W_STRAWBERRY_01	West Strawberry Creek	Headwaters to mouth	1	Fecal Coliform	Applicable WQS attained; reason for recovery unspecified
SD-BF-R-WHITEWOOD_03	Whitewood Creek	Deadwood Creek to Spruce Gulch	4a	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-BF-R-WHITEWOOD_03	Whitewood Creek	Deadwood Creek to Spruce Gulch	4a	Fecal Coliform	Applicable WQS attained; reason for recovery unspecified
SD-BF-R-WILLOW_01_USGS	Willow Creek	Near Vale, SD	3	Specific Conductance	Applicable WQS attained; due to change in WQS
SD-BS-L-BITTER_01	Bitter Lake	Day County	5	pH	Applicable WQS attained; reason for recovery unspecified
SD-BS-L-BLUE_DOG_01	Blue Dog Lake	Day County	5	*Escherichia coli*	Applicable WQS attained; original basis for listing was incorrect
SD-BS-L-BULLHEAD_01	Bullhead Lake	Deuel County	5	pH	Applicable WQS attained; reason for recovery unspecified
SD-BS-R-BEAVER_01	Beaver Creek	Big Sioux River to S9, T98N, R49W	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_03	Big Sioux River	Willow Creek to Stray Horse Creek	4a	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_06	Big Sioux River	Brookings to Brookings/Moody County Line	1	Total Suspended Solids (TSS)	Applicable WQS attained; reason for recovery unspecified
SD-BS-R-BRULE_01	Brule Creek	Big Sioux River to confluence of its east and west forks	1	Fecal Coliform	Applicable WQS attained; reason for recovery unspecified
SD-BS-R-BRULE_01	Brule Creek	Big Sioux River to confluence of its east and west forks	1	Total Suspended Solids (TSS)	Applicable WQS attained; reason for recovery unspecified
SD-BS-R-EAST_BRULE_01	East Brule Creek	confluence with Brule Creek to S3, T95N, R49W	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-BS-R-NORTH_DEER_01	North Deer Creek	Six Mile Creek to U.S. Highway 77	1	Oxygen, Dissolved	Applicable WQS attained; original basis for listing was incorrect
SD-BS-R-PEG_MUNKY_RUN_01	Peg Munky Run	Big Sioux River to S17, T113N, R50W	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-BS-R-UNION_01	Union Creek	Big Sioux River to confluence with East and West Forks	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-L-CENTER_01	Center Lake	Custer County	5	pH	TMDL approved or established by EPA (4A)

AUID	WATER_NAME	LOCATION	2012 Category	CAUSE_NAME	DELISTING_REASON_DESC
SD-CH-L-CURLEW_01	Curlew Lake	Meade County	2	Temperature, water	Applicable WQS attained; reason for recovery unspecified
SD-CH-L-HORSETHIEF_01	Horsethief Lake	Pennington County	5	pH	TMDL approved or established by EPA (4A)
SD-CH-L-LEGION_01	Legion Lake	Custer County	4a	Oxygen, Dissolved	Applicable WQS attained; original basis for listing was incorrect
SD-CH-L-LEGION_01	Legion Lake	Custer County	4a	pH	TMDL approved or established by EPA (4A)
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	5	Oxygen, Dissolved	Applicable WQS attained; reason for recovery unspecified
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	5	Fecal Coliform	Applicable WQS attained; threatened water no longer threatened
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	5	Total Suspended Solids (TSS)	Applicable WQS attained; reason for recovery unspecified
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	5	Salinity	Applicable WQS attained; due to change in WQS
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	5	Specific Conductance	Applicable WQS attained; due to change in WQS
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	5	Total Dissolved Solids	Applicable WQS attained; due to change in WQS
SD-CH-R-CHEYENNE_02B	Cheyenne River	Cascade Creek to Angostura Reservoir	1	Total Suspended Solids (TSS)	Applicable WQS attained; reason for recovery unspecified
SD-CH-R-CHEYENNE_03	Cheyenne River	Fall River to Cedar Creek	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-CHEYENNE_05	Cheyenne River	Belle Fourche River to Bull Creek	5	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-CH-R-CHEYENNE_05	Cheyenne River	Belle Fourche River to Bull Creek	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-CHEYENNE_06	Cheyenne River	Bull Creek to Lake Oahe	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-FRENCH_01	French Creek	S23, T3S, R3E to Custer	1	Oxygen, Dissolved	Applicable WQS attained; reason for recovery unspecified
SD-CH-R-HORSEHEAD_01_USGS	Horsehead Creek	At Oelrichs	3	Specific Conductance	Applicable WQS attained; due to change in WQS
SD-CH-R-RAPID_03	Rapid Creek	Canyon Lake to S15, T1N, R8E	5	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-RAPID_04	Rapid Creek	S15, T1N, R8E to above Farmingdale	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-RAPID_05	Rapid Creek	Above Farmingdale to Cheyenne River	4a	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-CH-R-RAPID_05	Rapid Creek	Above Farmingdale to Cheyenne River	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-CH-R-RAPID_05	Rapid Creek	Above Farmingdale to Cheyenne River	4a	Total Suspended Solids (TSS)	TMDL approved or established by EPA (4A)
SD-CH-R-SPRING_02	Spring Creek	Sheridan Lake to SD HWY 79	1	Temperature, water	Applicable WQS attained; reason for recovery unspecified
SD-JA-L-ROSEHILL_01	Rosehill Lake	Hand County	3	Oxygen, Dissolved	Other: dam breach

AUID	WATER_NAME	LOCATION	2012 Category	CAUSE_NAME	DELISTING_REASON_DESC
SD-JA-R-DAWSON_01	Dawson Creek	James River to Lake Henry	4a	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-JA-R-DAWSON_01	Dawson Creek	James River to Lake Henry	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-JA-R-FIRESTEEL_01	Firesteel Creek	West Fork Firesteel Creek to mouth	5	Total Dissolved Solids	Applicable WQS attained; reason for recovery unspecified
SD-JA-R-JAMES_01	James River	North Dakota border to Mud Lake Reservoir	5	pH	Applicable WQS attained; reason for recovery unspecified
SD-JA-R-JAMES_02	James River	Mud Lake Reservoir	1	pH	Applicable WQS attained; reason for recovery unspecified
SD-JA-R-JAMES_11	James River	Yankton County line to mouth	5	Fecal Coliform	Applicable WQS attained; reason for recovery unspecified
SD-JA-R-MOCCASIN_02	Moccasin Creek	James River to S24, T123N, R64W	5	pH	Applicable WQS attained; reason for recovery unspecified
SD-JA-R-WOLF_02	Wolf Creek	Just above Wolf Creek Colony to the mouth.	5	Total Suspended Solids (TSS)	TMDL approved or established by EPA (4A)
SD-MI-L-DANTE_01	Dante Lake	Charles Mix County	4a	Oxygen, Dissolved	TMDL approved or established by EPA (4A)
SD-MI-L-GEDDES_01	Geddes Lake	Charles Mix County	5	Oxygen, Dissolved	TMDL approved or established by EPA (4A)
SD-MI-L-POCASSE_01	Lake Pocasse	Campbell County	5	*Escherichia coli*	Applicable WQS attained; original basis for listing was incorrect
SD-MI-R-CHOTEAU_01	Choteau Creek	Lewis & Clark Lake to S34, T96N, R63W	1	Total Suspended Solids (TSS)	Applicable WQS attained; reason for recovery unspecified
SD-MI-R-EMANUEL_01	Emanuel Creek	Lewis and Clark Lake to S20, T94N, R60W	4a	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-MI-R-PONCA_01	Ponca Creek	SD/NE border to US Hwy 183	4a	Fecal Coliform	TMDL approved or established by EPA (4A)
SD-MN-R-WHETSTONE_S_FORK_02	South Fork Whetstone River	Lake Farley to mouth	5	Oxygen, Dissolved	Applicable WQS attained; threatened water no longer threatened
SD-MU-R-MOREAU_03	Moreau River	Green Grass to mouth	5	Salinity	Applicable WQS attained; threatened water no longer threatened
SD-MU-R-THUNDER_BUTTE_01	Thunder Butte Creek	Headwaters to mouth	2	Oxygen, Dissolved	Applicable WQS attained; threatened water no longer threatened
SD-NI-R-KEYA_PAHA_01	Keya Paha River	SD/NE border to confluence with Antelope Creek	4a	*Escherichia coli*	TMDL approved or established by EPA (4A)
SD-VM-L-SWAN_01	Swan Lake	Turner County	1	pH	Applicable WQS attained; reason for recovery unspecified
SD-VM-R-VERMILLION_02	Vermillion River	Turkey Ridge Creek to Baptist Creek	4a	*Escherichia coli*	Applicable WQS attained; original basis for listing was incorrect
SD-VM-R-VERMILLION_02	Vermillion River	Turkey Ridge Creek to Baptist Creek	4a	Total Suspended Solids (TSS)	TMDL approved or established by EPA (4A)
SD-VM-R-VERMILLION_03	Vermillion River	Baptist Creek to mouth	4a	Total Suspended Solids (TSS)	TMDL approved or established by EPA (4A)
SD-WH-R-LAKE_01_USGS	Lake Creek	Above and below refuge near Tuthill, SD	1	Temperature, water	Applicable WQS attained; original basis for listing was incorrect

APPENDIX C

SURFACE WATER QUALITY MONITORING SCHEDULE

AND SAMPLING SITE DESCRIPTION

Analysis Groups	1	2	3	4	5	6	7	8	9	10	11	12
Field Analysis Parameters												
Water Temperature	X	X	X	X	X	X	X	X	X	X	X	X
Air Temperature	X	X	X	X	X	X	X	X	X	X	X	X
Dissolved Oxygen	X	X	X	X	X	X	X	X	X	X	X	X
Conductivity	X	X	X	X	X	X	X	X	X	X	X	X
pH	X	X	X	X	X	X	X	X	X	X	X	X
Waterbody Depth	X	X	X	X	X	X	X	X	X	X	X	X
Waterbody Width	X	X	X	X	X	X	X	X	X	X	X	X
Laboratory Analysis Parameters												
Alkalinity	X	X	X	X	X	X	X	X	X	X	X	X
Hardness	X	X	X	X	X	X	X	X	X	X	X	X
Dissolved Solids	X	X	X	X	X	X	X	X	X	X	X	X
Suspended Solids	X	X	X	X	X	X	X	X	X	X	X	X
Total Phosphorous	X	X	X	X	X	X	X	X	X	X	X	X
Dissolved Phosphorus	X	X	X	X	X	X	X	X	X	X	X	X
Ammonia	X	X	X	X	X	X	X	X	X	X	X	X
Nitrate-Nitrite	X	X	X	X	X	X	X	X	X	X	X	X
TKN	X	X	X	X	X	X	X	X	X	X	X	
BOD				X				X	X			X
CBOD									X			
E. Coli	M/S	M/S	M/S	M/S	M/S	M/S	M/S	X	M/S	M/S	M/S	M/S
Total Fecal Coliform	M/S	M/S	M/S	M/S	M/S	M/S	M/S	X	M/S	M/S	M/S	M/S
Total Calcium	M/A	M/A		M/A		M/A	X		M/A	M/A	X	M/A
Chloride	X						X	M/A			X	X
Total Magnesium	M/A	M/A		M/A		M/A	X	M/A	M/A	M/A	X	M/A
Total Sodium	M/A	M/A		M/A		M/A	X	X	M/A	M/A	X	M/A
Sulfates	X						X				X	X
Total Cyanide					X	X						X
WAD Cyanide					X	X						X
Total and Dissolved Arsenic					X	X				X	X	X
Total and Dissolved Cadmium					X	X						X
Total and Dissolved Chromium					X	X						X
Total and Dissolved Copper					X	X						X
Total and Dissolved Lead					X	X						X
Total and Dissolved Mercury					X	X						X
Total and Dissolved Nickel					X	X						X
Total and Dissolved Selenium					X	X						X
Total and Dissolved Silver					X	X						X
Total and Dissolved Zinc					X	X						X
Total and Dissolved Barium										X	X	
Total and Dissolved Molybdenum										X	X	
Total and Dissolved Uranium										X	X	
Radium 226										X	X	
Radium 228										X	X	
Total Petroleum Hydrocarbons												X
Volatile Organic Carbons												X

M/A = May through August M/S = May through September X = Every visit

Ambient WQM Stations - By WQM Number

WQM #	Waterbody	Storet Number	County	Sampling Frequency	Beneficial Uses	Analysis Group	Region
1	Big Sioux River	460740	CODINGTON	Monthly	5,8,9,10	Group 1	Northeast
2	Big Sioux River	460702	BROOKINGS	Monthly	5,8,9,10	Group 1	Southeast
3	Big Sioux River	460703	MINNEHAHA	Monthly	1,5,7,8,9,10	Group 1	Southeast
4	Vermillion River	460755	CLAY	Monthly	5,8,9,10	Group 2	Southeast
5	Vermillion River	460745	CLAY	Monthly	5,8,9,10	Group 2	Southeast
6	James River	460805	BROWN	Monthly	5,8,9,10	Group 2	Northeast
7	James River	460707	HANSON	Quarterly	5,8,9,10	Group 2	Southeast
8	James River	460761	YANKTON	Monthly	5,8,9,10	Group 2	Southeast
10	Keya Paha River	460815	TRIPP	Quarterly	5,8,9,10	Group 1	Central
11	White River	460835	JACKSON	Monthly	5,8,9,10,S4	Group 2	Central
12	White River	460825	LYMAN	Monthly	5,8,9,10,S5	Group 2	Central
13	Little White River	460840	MELLETTE	Monthly	5,8,9,10,S6	Group 2	Central
14	Cheyenne River	460875	FALL RIVER	Monthly	5,8,9,10	Group 11	Black Hills
15	Cheyenne River	460865	PENNINGTON	Monthly	5,7,8,9,10	Group 2	Central
16	Cheyenne River	468860	ZIEBACH	Monthly	4,7,8,9,10	Group 2	Central
17	Battle Creek	460905	PENNINGTON	Monthly	2,8,9,10	Group 3	Black Hills
19	Rapid Creek	460910	PENNINGTON	Monthly	4,7,8,9,10	Group 2	Black Hills
21	Belle Fourche River	460880	MEADE	Quarterly	4,7,8,9,10	Group 2	Central
22	Spearfish Creek	460900	LAWRENCE	Monthly	1,2,7,8,9,10	Group 3	Black Hills
23	Redwater River	460895	BUTTE	Monthly	3,8,9,10	Group 2	Central
24	Moreau River	460935	DEWEY	Monthly	5,8,9,10	Group 2	Central
25	Grand River	460945	CORSON	Monthly	4,8,9,10	Group 2	Central
26	Little Missouri River	460955	HARDING	Quarterly	5,8,9,10	Group 2	Central
27	Little Minnesota River	460710	ROBERTS	Quarterly	5,8,9,10	Group 3	Northeast
28	Whetstone River	460700	GRANT	Quarterly	5,8,9,10	Group 3	Northeast
29	Bad River	460850	STANLEY	Quarterly	6,8,9,10	Group 4	Central
30	Box Elder Creek	460925	LAWRENCE	Monthly	2,8,9,10	Group 3	Black Hills
31	Big Sioux River	460831	MINNEHAHA	Monthly	5,7,8,9,10	Group 2	Southeast
32	Big Sioux River	460832	UNION	Monthly	5,7,8,9,10	Group 3	Southeast
33	James River	460733	BROWN	Monthly	5,8,9,10	Group 2	Northeast
34	James River	460734	BROWN	Quarterly	5,8,9,10	Group 2	Northeast
35	James River	460735	BEADLE	Quarterly	1,5,8,9,10	Group 9	Southeast
36	James River	460736	BEADLE	Quarterly	5,8,9,10	Group 9	Southeast
37	James River	460737	DAVISON	Quarterly	5,8,9,10	Group 2	Southeast
39	Moreau River	460039	PERKINS	Quarterly	5,8,9,10	Group 10	Central
40	Grand River	460640	PERKINS	Quarterly	3,8,9,10	Group 10	Central
42	White River	460842	SHANNON	Quarterly	5,8,9,10,S3	Group 10	Black Hills
45	Lac Qui Parle River, W Branch	460645	DEUEL	Quarterly	3,8,9,10	Group 3	Northeast
46	Castle Creek	460646	PENNINGTON	Monthly	2,8,9,10	Group 3	Black Hills
47	Rapid Creek	460647	PENNINGTON	Monthly	1,2,7,8,9,10	Group 1	Black Hills

WQM #	Waterbody	Storet Number	County	Sampling Frequency	Beneficial Uses	Analysis Group	Region
49	Spring Creek	460649	PENNINGTON	Quarterly	3,7,8,9,10	Group 3	Black Hills
50	Grace Coolidge Creek	460650	CUSTER	Quarterly	2,8,9,10	Group 3	Black Hills
51	French Creek	460651	CUSTER	Quarterly	3,8,9,10	Group 3	Black Hills
52	Whitewood Creek	460652	LAWRENCE	Monthly	4,8,9,10	Group 3	Black Hills
53	French Creek	460653	CUSTER	Quarterly	3,8,9,10	Group 3	Black Hills
54	Spring Creek	460654	PENNINGTON	Monthly	3,7,8,9,10	Group 3	Black Hills
55	Big Sioux River	460655	CODINGTON	Monthly	5,8,9,10	Group 2	Northeast
57	Fall River	460657	FALL RIVER	Quarterly	3,8,9,10	Group 1	Black Hills
61	Vermillion River	460661	TURNER	Monthly	5,8,9,10	Group 2	Southeast
62	Big Sioux River	460662	BROOKINGS	Monthly	5,8,9,10	Group 1	Southeast
64	Big Sioux River	460664	MINNEHAHA	Monthly	1,5,7,8,9,10	Group 4	Southeast
65	Big Sioux River	460665	LINCOLN	Monthly	5,7,8,9,10	Group 2	Southeast
66	Big Sioux River	460666	LINCOLN	Monthly	5,7,8,9,10	Group 2	Southeast
67	Big Sioux River	460667	UNION	Monthly	5,7,8,9,10	Group 2	Southeast
69	Rapid Creek	460669	PENNINGTON	Monthly	1,2,7,8,9,10	Group 7	Black Hills
70	Ponca Creek	460670	GREGORY	Quarterly	5,8,9,10	Group 1	Central
71	Missouri River	460671	HUGHES	Quarterly	1,2,7,8,9,10,	Group 2	Central
72	Missouri River	460672	LYMAN	Quarterly	1,2,7,8,9,10,	Group 2	Central
73	Missouri River	460673	CHARLES MIX	Quarterly	1,4,7,8,9,10,	Group 2	Southeast
74	Missouri River	460674	YANKTON	Quarterly	1,4,7,8,9,10,	Group 2	Southeast
75	West Strawberry Creek	460675	LAWRENCE	Quarterly	2,8,9,10	Group 3	Black Hills
76	Belle Fourche River	460676	MEADE	Monthly	4,7,8,9,10	Group 2	Central
77	Grand River, N Fork	460677	PERKINS	Quarterly	6,8,9,10	Group 2	Central
78	Grand River, S Fork	460678	PERKINS	Quarterly	5,8,9,10	Group 2	Central
79	Box Elder Creek	460679	PENNINGTON	Quarterly	6,8,9,10	Group 2	Black Hills
81	Belle Fourche River	460681	BUTTE	Quarterly	4,7,8,9,10	Group 6	Central
82	Whitewood Creek	460682	BUTTE	Monthly	4,8,9,10	Group 5	Central
83	Belle Fourche River	460683	BUTTE	Quarterly	4,7,8,9,10	Group 6	Central
84	Whitewood Creek	460684	LAWRENCE	Monthly	3,7,8,9,10	Group 5	Black Hills
85	Whitewood Creek	460685	LAWRENCE	Monthly	3,7,8,9,10	Group 7	Black Hills
86	Whitewood Creek	460686	LAWRENCE	Quarterly	2,7,8,9,10	Group 5	Black Hills
87	Yellow Bank River, S Fork	460687	GRANT	Quarterly	3,8,9,10	Group 3	Northeast
88	Yellow Bank River, N Fork	460688	GRANT	Quarterly	4,8,9,10	Group 3	Northeast
89	Spearfish Creek	460689	LAWRENCE	Monthly	1,2,7,8,9,10	Group 3	Black Hills
90	Whetstone River, S Fork	460690	GRANT	Quarterly	6,8,9,10	Group 3	Northeast
91	Whetstone River, S Fork	460691	GRANT	Quarterly	6,8,9,10	Group 3	Northeast
92	Rapid Creek	460692	PENNINGTON	Monthly	4,7,8,9,10	Group 2	Black Hills
94	Moccasin Creek	460694	BROWN	Monthly	9,10	Group 3	Northeast
95	Moccasin Creek	460695	BROWN	Monthly	6,8,9,10	Group 3	Northeast
102	French Creek	460102	CUSTER	Monthly	3,8,9,10	Group 2	Black Hills
103	Battle Creek	460103	PENNINGTON	Seasonal	2,8,9,10	Group 3	Black Hills
110	Rapid Creek	460110	PENNINGTON	Monthly	4,7,8,9,10	Group 7	Black Hills
111	Flynn Creek	460111	CUSTER	Quarterly	3,8,9,10	Group 3	Black Hills
112	James River	460112	BROWN	Monthly	5,8,9,10	Group 2	Northeast

WQM #	Waterbody	Storet Number	County	Sampling Frequency	Beneficial Uses	Analysis Group	Region
113	James River	460113	BROWN	Monthly	5,8,9,10	Group 2	Northeast
116	Strawberry Creek	460116	LAWRENCE	Monthly	3,8,9,10	Group 5	Black Hills
117	Big Sioux River	460117	MINNEHAHA	Monthly	5,7,8,9,10	Group 4	Southeast
118	Whitetail Creek	460118	LAWRENCE	Monthly	2,7,8,9,10	Group 5	Black Hills
119	Fantail Creek	460119	LAWRENCE	Quarterly	2,7,8,9,10	Group 5	Black Hills
120A	Stewart Gulch	460124	LAWRENCE	Quarterly	2,8,9,10	Group 5	Black Hills
121	Skunk Creek	460121	MINNEHAHA	Quarterly	6,8,9,10	Group 4	Southeast
122	Whitewood Creek	460122	LAWRENCE	Monthly	3,7,8,9,10	Group 7	Black Hills
123	Whitewood Creek	460123	LAWRENCE	Monthly	3,7,8,9,10	Group 5	Black Hills
125	Bear Butte Creek	460125	LAWRENCE	Monthly	2,8,9,10	Group 5	Black Hills
126	Bear Butte Creek	460126	LAWRENCE	Monthly	2,8,9,10	Group 5	Black Hills
127	Deadwood Creek	460127	LAWRENCE	Monthly	3,7,8,9,10	Group 5	Black Hills
128	Beaver Creek	460128	FALL RIVER	Quarterly	3,8,9,10	Group 11	Black Hills
130	Belle Fourche River	460130	BUTTE	Monthly	4,7,8,9,10	Group 7	Central
131	Cherry Creek	460131	MEADE	Quarterly	6,8,9,10	Group 2	Central
132	Cheyenne River	460132	CUSTER	Monthly	5,7,8,9,10	Group 2	Black Hills
133	Cheyenne River	460133	HAAKON	Monthly	4,7,8,9,10	Group 2	Central
134	Choteau Creek	460134	BON HOMME	Quarterly	5,8,9,10	Group 2	Southeast
135	Crow Creek	460135	BUFFALO	Quarterly	5,8,9,10	Group 2	Central
136	Elm River	460136	BROWN	Monthly	1,5,8,9,10	Group 2	Northeast
137	Firesteel Creek	460137	DAVISON	Quarterly	1,4,8,9,10	Group 2	Southeast
138	Grand River	460138	CORSON	Quarterly	4,8,9,10	Group 2	Central
139	Grand River, S Fork	460139	HARDING	Quarterly	5,8,9,10	Group 2	Central
140	James River	460140	SPINK	Monthly	5,8,9,10	Group 2	Northeast
141	Medicine Creek	460141	LYMAN	Monthly	6,8,9,10	Group 2	Central
142	Medicine Knoll Creek	460142	HUGHES	Quarterly	6,8,9,10	Group 2	Central
143	Moreau River	460143	ZIEBACH	Quarterly	5,8,9,10	Group 2	Central
144	Moreau River, S Fork	460144	PERKINS	Quarterly	6,8,9,10	Group 2	Central
145	Mud Creek	460145	BROWN	Quarterly	6,8,9,10	Group 2	Northeast
146	Snake Creek	460146	SPINK	Quarterly	5,8,9,10	Group 2	Northeast
147	Thunder Butte Creek	460147	PERKINS	Quarterly	6,8,9,10	Group 2	Central
150	Vermillion River, E Fork	460150	MCCOOK	Quarterly	6,8,9,10	Group 2	Southeast
151	Wolf Creek	460151	SPINK	Quarterly	6,8,9,10	Group 2	Northeast
152	White River	460152	MELLETTE	Monthly	5,8,9,10,S5	Group 2	Central
153	Cottonwood Creek	460153	MELLETTE	Monthly	9,10	Group 2	Central
154	Vermillion River, E Fork	460154	MCCOOK	Quarterly	6,8,9,10	Group 2	Southeast
155	Spring Creek	460155	CAMPBELL	Monthly	5,8,9,10	Group 2	Central
156	Cheyenne River 1 mile below	460156	FALL RIVER	Monthly	5,8,9,10	Group 11	Black Hills
157	Wolf Creek above Wolf Creek Colony	460157	HUTCHINSON	Monthly	6,8,9,10	Group 8	Southeast
158	Wolf Creek below Wolf Creek Colony	460158	HUTCHINSON	Monthly	6,8,9,10	Group 8	Southeast
160	Crooked Creek	460160	Harding	Quarterly	6,8,9,10	Group 10	Central
161	Bull Creek	460161	Harding	Quarterly	6,8,9,10	Group 10	Central
162	Grand River, S Fork	460162	Perkins	Quarterly	5,8,9,10	Group 10	Central
163	Cheyenne River	460163	Fall River	Quarterly	5,8,9,10	Group 11	Black Hills

WQM #	Waterbody	Storet Number	County	Sampling Frequency	Beneficial Uses	Analysis Group	Region
164	Cheyenne River	460164	Fall River	Quarterly	5,8,9,10	Group 11	Black Hills
165	Unnamed tributary to Big Ditch Creek	460165	Union	Quarterly	9,10	Group 12	Southeast
166	Brule Creek	460166	Union	Quarterly	6,8,9,10	Group 12	Southeast
167	Unnamed tributary to Brule Creek	460167	Union	Quarterly	9,10	Group 12	Southeast
168	Brule Creek	460168	Union	Quarterly	6,8,9,10	Group 12	Southeast
169	Big Ditch Creek	460169	Union	Quarterly	9,10	Group 12	Southeast
170	Little Minnesota River	460170	Roberts	Monthly	9,10	Group 8	Northeast
171	Little Minnesota River	460171	Roberts	Monthly	5,8,9,10	Group 8	Northeast
172	Turtle Creek	460172	Spink	Quarterly	6,8,9,10	Group 2	Southeast
173	Rapid Creek	460173	Pennington	Monthly	1,2,7,8,9,10	Group 7	Black Hills
BSA1	Big Sioux River	46BSA1	GRANT	Monthly	5,8,9,10	Group 1	Northeast
BS08	Big Sioux River	46BS08	HAMLIN	Monthly	5,8,9,10	Group 1	Northeast
BS18	Big Sioux River	46BS18	MOODY	Monthly	1,5,8,9,10	Group 1	Southeast
BS23	Big Sioux River	46BS23	MINNEHAHA	Monthly	1,5,7,8,9,10	Group 1	Southeast
BS29	Big Sioux River	46BS29	MINNEHAHA	Monthly	5,7,8,9,10	Group 4	Southeast
BS49	Brule Creek	46BS49	UNION	Quarterly	6,8,9,1	Group 12	Southeast
MN31	Annie Creek	46MN31	LAWRENCE	Quarterly	3,8,9,10	Group 5	Black Hills
MN32	Spearfish Creek	46MN32	LAWRENCE	Quarterly	1,2,7,8,9,10,	Group 5	Black Hills
MN33	Spearfish Creek	46MN33	LAWRENCE	Quarterly	1,2,7,8,9,10,	Group 5	Black Hills
MN34	Spearfish Creek	46MN34	LAWRENCE	Quarterly	1,2,7,8,9,10,	Group 5	Black Hills
MN35	Spearfish Creek	46MN35	LAWRENCE	Quarterly	2,8,9,10	Group 5	Black Hills
MN38	False Bottom Creek	46MN38	LAWRENCE	Quarterly	3,8,9,10	Group 5	Black Hills
MN39	Cleopatra Creek (former Squaw Creek)	46MN39	LAWRENCE	Quarterly	2,7,8,9,10	Group 5	Black Hills

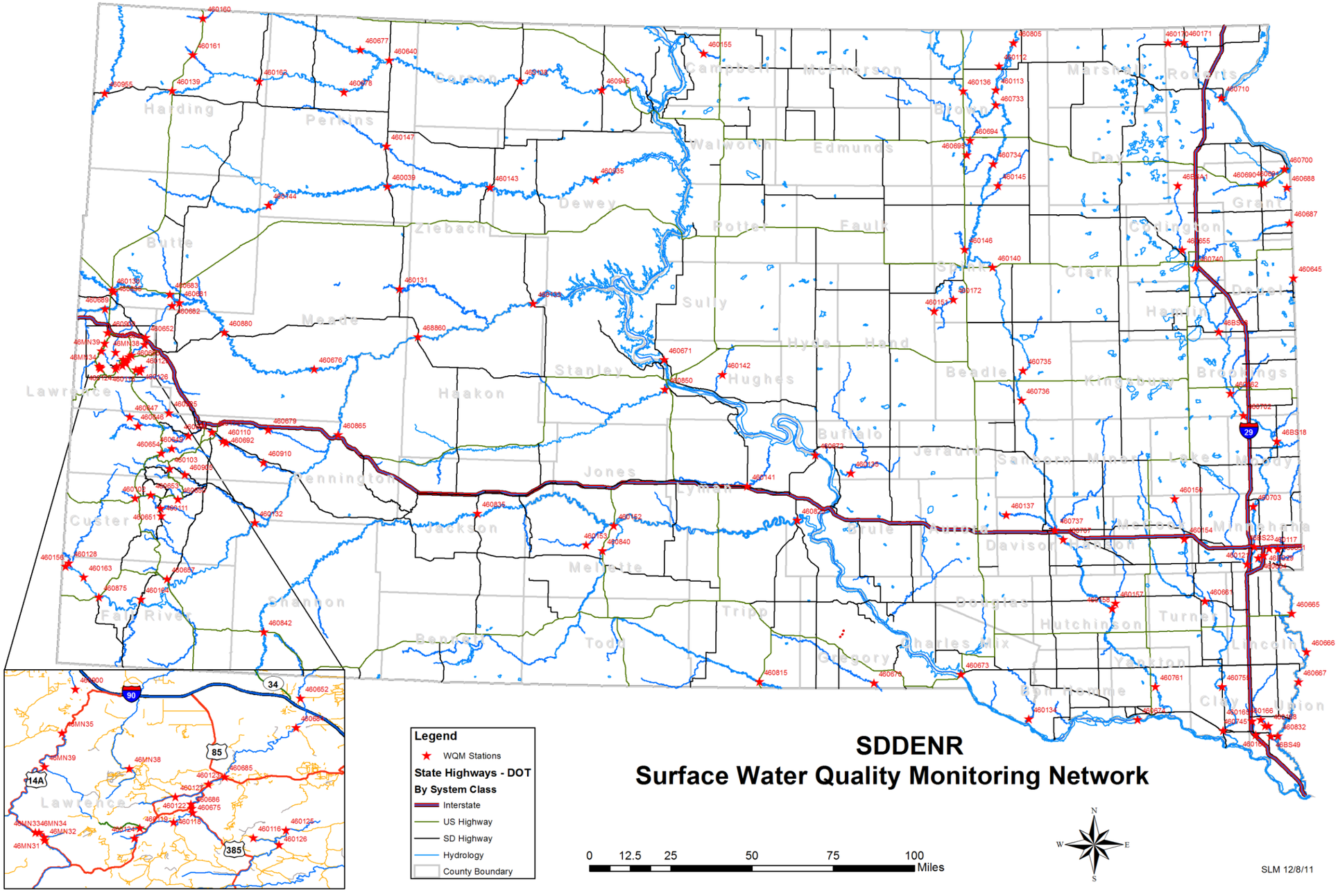

Figure 30: South Dakota DENR Water Quality Monitoring Sites

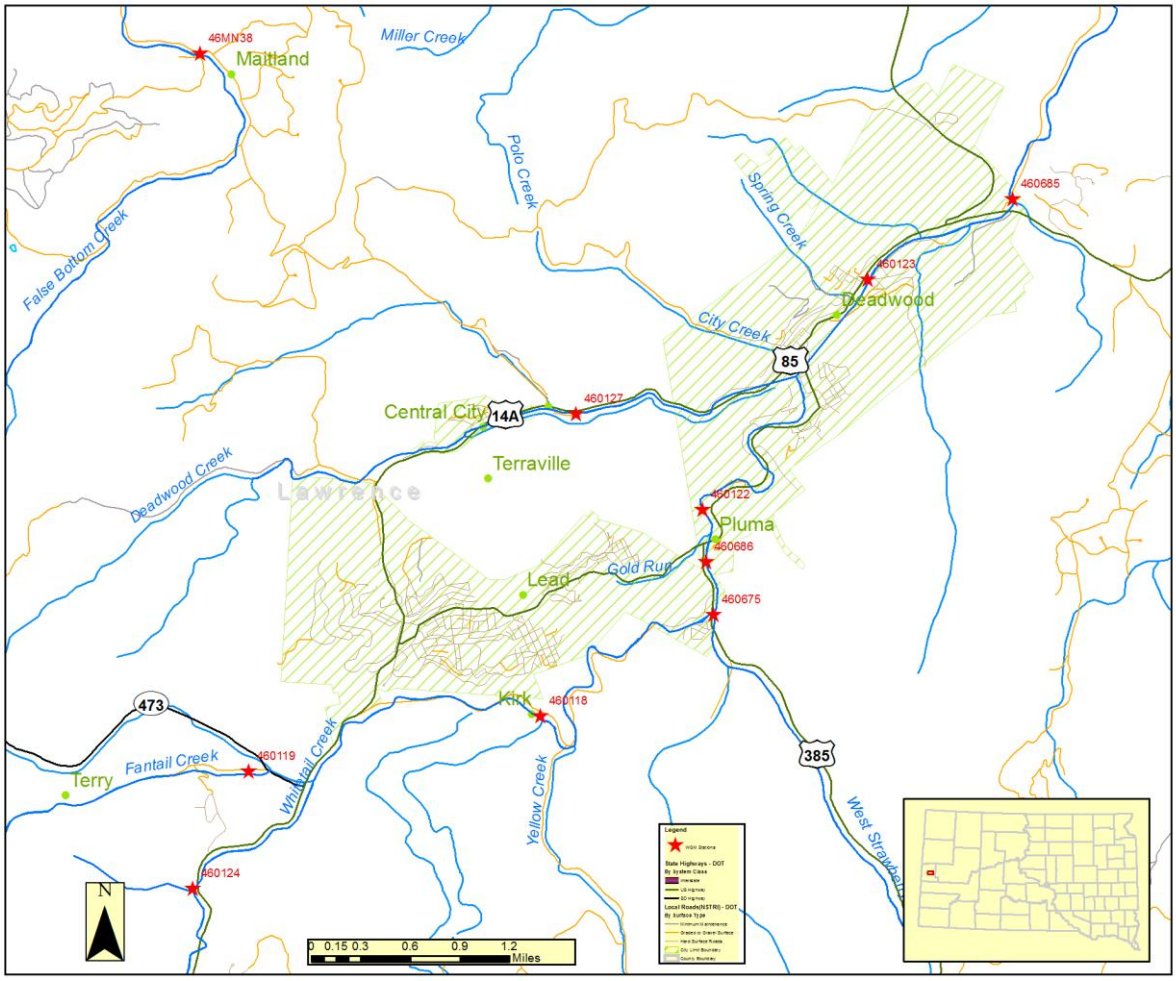

Figure 31: Water Quality Monitoring Sites on Whitewood Creek and Tributaries in Lead-Deadwood Area

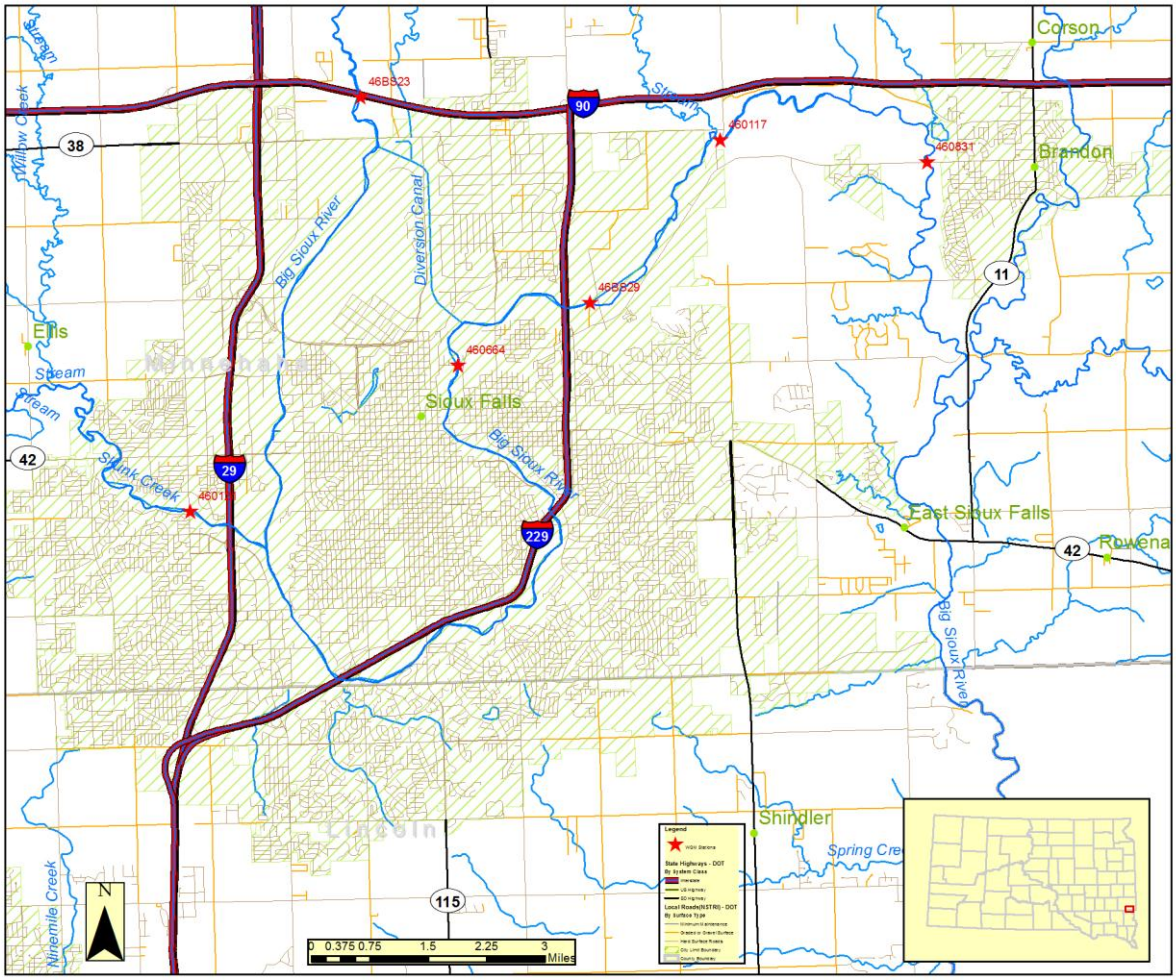

Figure 32: Water Quality Monitoring Sites Located on the Big Sioux River in the Sioux Falls Area

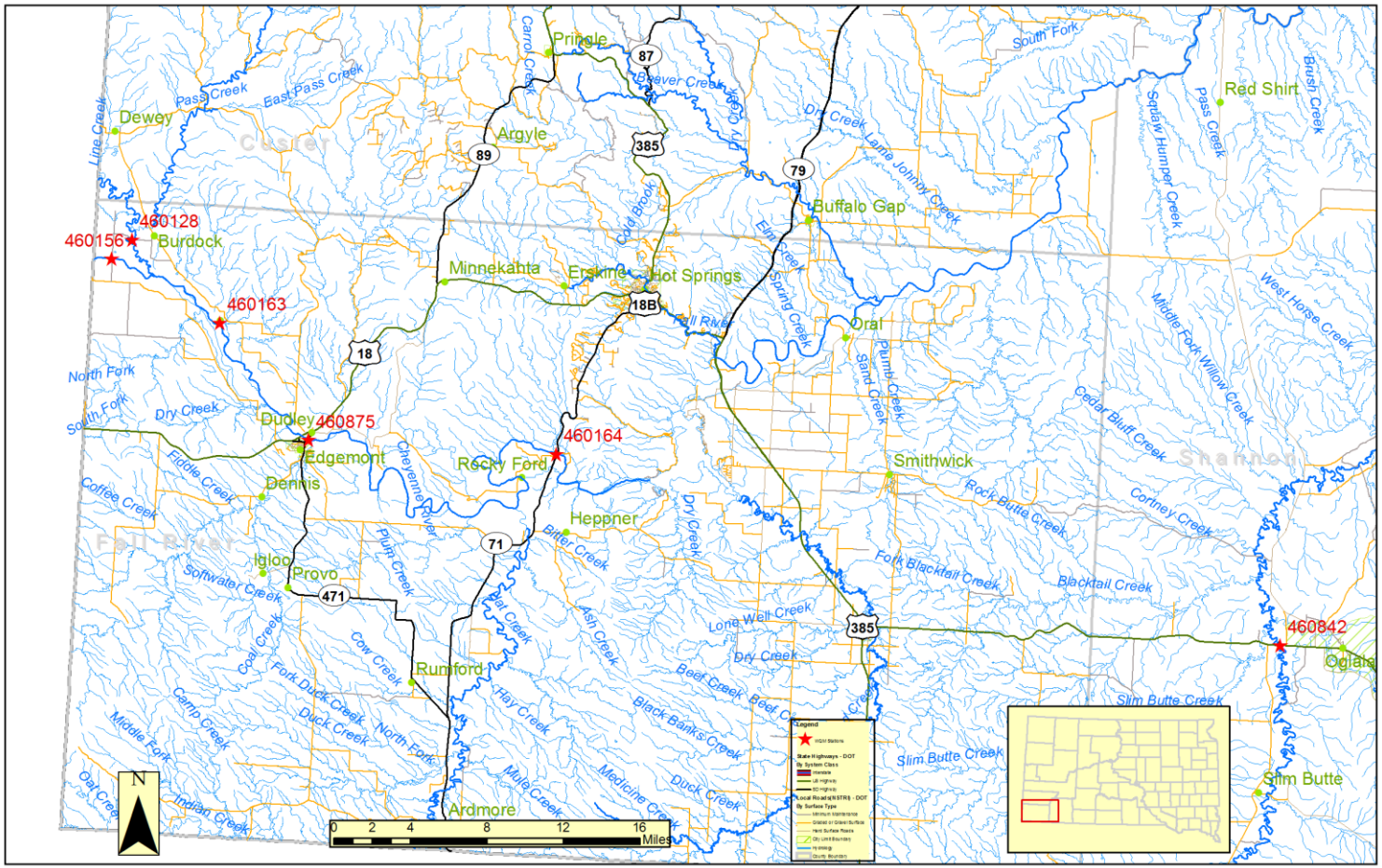

Figure 33: Water Quality Monitoring Sites Located along the Cheyenne River and White River that are Monitored for Uranium

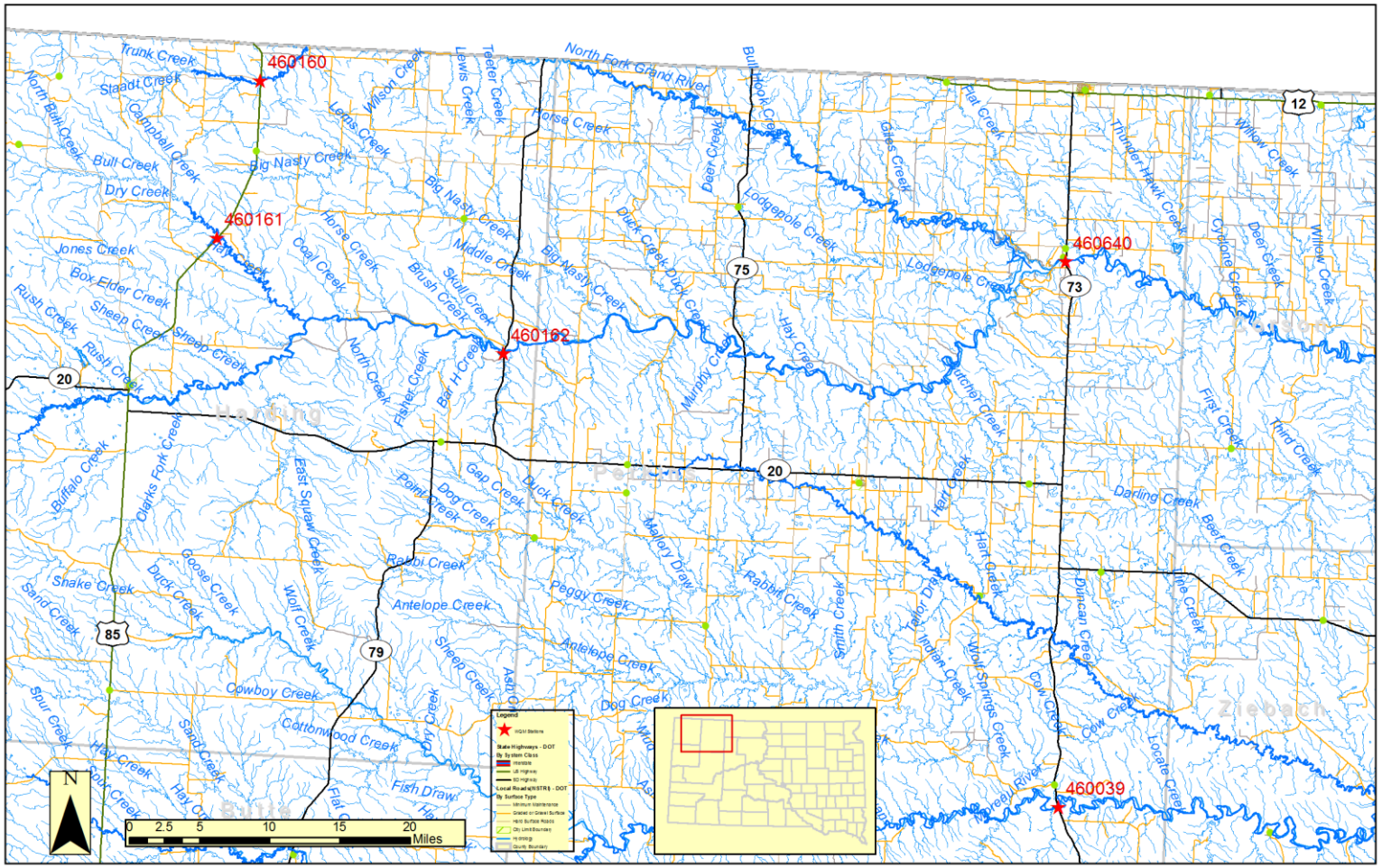

Figure 34: Water Quality Monitoring Sites Located near the Grand River and Moreau River that are Monitored for Uranium

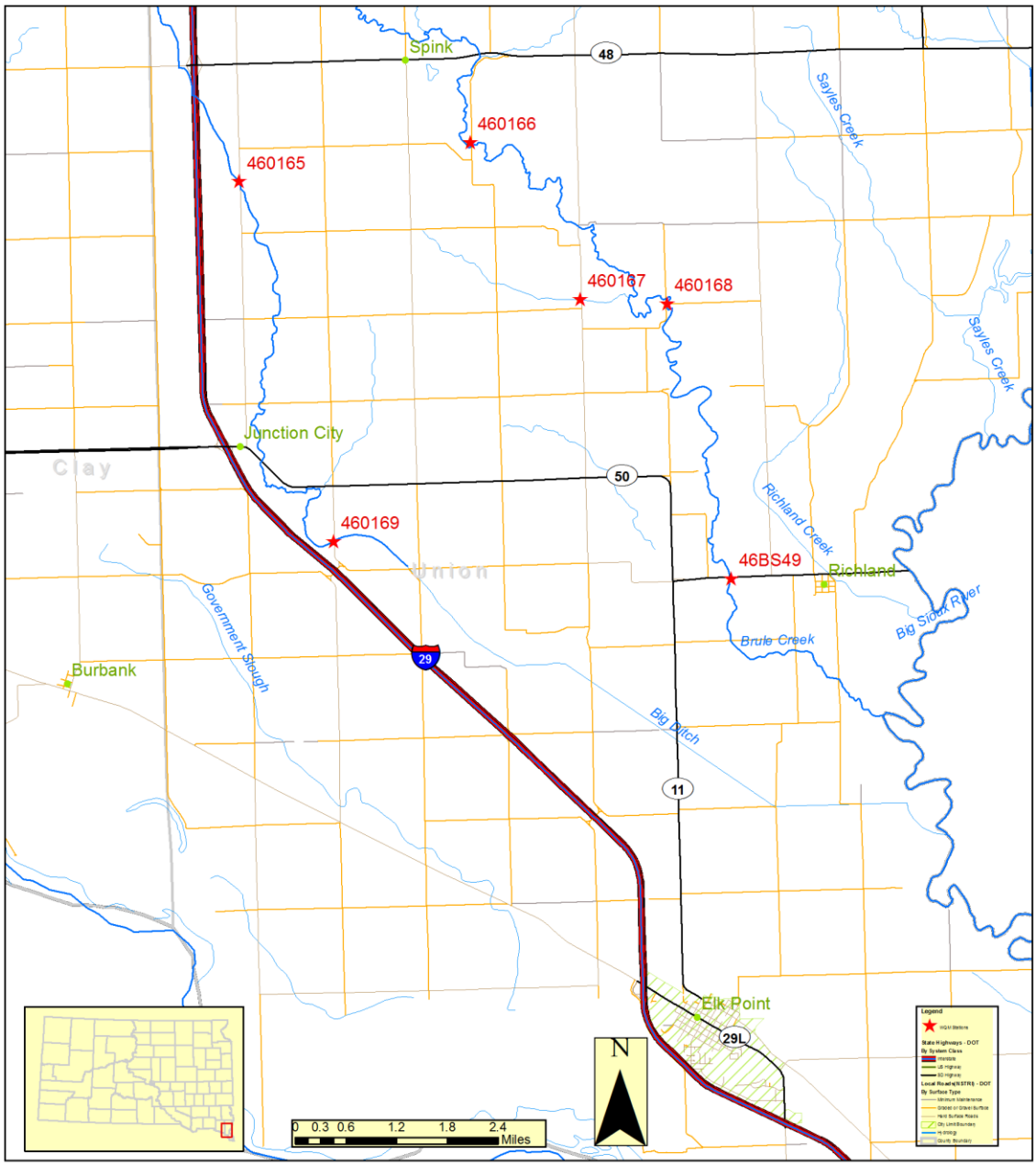

Figure 35: Water Quality Monitoring Sites Located near the Proposed Hyperion Site

APPENDIX D

303(D) SUMMARY

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	Specific Conductance	2006	L	2018
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	TDS	2006	L	2018
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	Oxygen, Dissolved	2010	L	2018
SD-BA-L-MURDO_01	Murdo Dam	Jones County	Oxygen, Dissolved	2012	L	2024
SD-BA-L-WAGGONER_01	Waggoner Lake	Haakon County	Chlorophyll-a	2010	L	2022
SD-BF-L-IRON_CREEK_01	Iron Creek Lake	Lawrence County	Temperature, water	2010	L	2022
SD-BF-L-MIRROR_EAST_01	Mirror Lake East	Lawrence County	Temperature, water	2006	L	2018
SD-BF-L-MIRROR_WEST_01	Mirror Lake West	Lawrence County	Temperature, water	2008	L	2020
SD-BF-L-NEWELL_01	Newell Lake	Butte County	Mercury	2012	H	2016
SD-BF-L-NEWELL_CITY_01	Newell City Pond	Butte County	Temperature, water	2010	L	2022
SD-BF-R-BEAR_BUTTE_01	Bear Butte Creek	Headwaters to Strawberry Creek	Temperature, water	1998	H	2016
SD-BF-R-BEAR_BUTTE_02	Bear Butte Creek	Strawberry Creek to S2, T4N, R4E	Temperature, water	2008	L	2020
SD-BF-R-BELLE_FOURCHE_01	Belle Fourche River	Wyoming border to Redwater River	*Escherichia coli*	2012	H	2014
SD-BF-R-REDWATER_01_USGS	Redwater River	WY border to Hwy 85	Temperature, water	2008	H	2016
SD-BF-R-WHITEWOOD_01	Whitewood Creek	Whitetail Summit to Gold Run Creek	Temperature, water	2006	H	2018
SD-BF-R-WHITEWOOD_04	Whitewood Creek	Spruce Gulch to Sandy Creek	*Escherichia coli*	2012	L	2024
SD-BF-R-WHITEWOOD_05	Whitewood Creek	Sandy Creek to I-90	pH	2006	L	2018
SD-BF-R-WHITEWOOD_06	Whitewood Creek	I-90 to Crow Creek	pH	2008	L	2020
SD-BF-R-WHITEWOOD_07	Whitewood Creek	Crow Creek to mouth	TSS	2010	L	2022
SD-BS-L-ALVIN_01	Lake Alvin	Lincoln County	Temperature, water	2010	L	2022
SD-BS-L-BITTER_01	Bitter Lake	Day County	Mercury	2006	H	2016
SD-BS-L-BLUE_DOG_01	Blue Dog Lake	Day County	pH	2010	L	2024
SD-BS-L-BULLHEAD_01	Bullhead Lake	Deuel County	Chlorophyll-a	2010	L	2022
SD-BS-L-E_OAKWOOD_01	East Oakwood Lake	Brookings County	pH	2012	L	2024
SD-BS-L-ISLAND_N_01	North Island Lake	Minnehaha/McCook counties	Mercury	2010	H	2016
SD-BS-L-OPITZ_01	Opitz Lake	Day County	Mercury	2012	H	2016
SD-BS-L-PELICAN_01	Pelican Lake	Codington County	pH	2008	L	2020
SD-BS-L-REID_01	Reid Lake	Clark County	Mercury	2012	H	2016
SD-BS-L-TWIN_01	Twin Lakes/W. Hwy 81	Kingsbury County	Mercury	2006	H	2016
SD-BS-L-TWIN_02	Twin Lakes	Minnehaha County	Mercury	2010	H	2016
SD-BS-R-BIG_SIOUX_01	Big Sioux River	S28, T121N, R52W to Lake Kampeska	Oxygen, Dissolved	2004	H	2014
SD-BS-R-BIG_SIOUX_01	Big Sioux River	S28, T121N, R52W to Lake Kampeska	*Escherichia coli*	2010	H	2014
SD-BS-R-BIG_SIOUX_08	Big Sioux River	S2, T104N, R49W to I-90	*Escherichia coli*	2010	H	2014

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-BS-R-BIG_SIOUX_08	Big Sioux River	S2, T104N, R49W to I-90	TSS	2010	H	2014
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	Fecal Coliform	2004	H	2016
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	*Escherichia coli*	2010	H	2016
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	TSS	2010	H	2016
SD-BS-R-BIG_SIOUX_11	Big Sioux River	Diversion return to SF WWTF	Fecal Coliform	2004	H	2016
SD-BS-R-BIG_SIOUX_11	Big Sioux River	Diversion return to SF WWTF	TSS	2004	H	2016
SD-BS-R-BIG_SIOUX_11	Big Sioux River	Diversion return to SF WWTF	*Escherichia coli*	2010	H	2016
SD-BS-R-BIG_SIOUX_12	Big Sioux River	SF WWTF to above Brandon	Fecal Coliform	2004	H	2016
SD-BS-R-BIG_SIOUX_12	Big Sioux River	SF WWTF to above Brandon	TSS	2004	H	2016
SD-BS-R-BIG_SIOUX_12	Big Sioux River	SF WWTF to above Brandon	*Escherichia coli*	2010	H	2016
SD-BS-R-BIG_SIOUX_13	Big Sioux River	Above Brandon to Nine Mile Creek	TSS	2004	H	2016
SD-BS-R-BIG_SIOUX_13	Big Sioux River	Above Brandon to Nine Mile Creek	*Escherichia coli*	2012	H	2016
SD-BS-R-BIG_SIOUX_14	Big Sioux River	Nine Mile Creek to near Fairview	TSS	2004	H	2016
SD-BS-R-EAST_BRULE_01	East Brule Creek	confluence with Brule Creek to S3, T95N, R49W	TSS	2008	H	2014
SD-BS-R-PIPESTONE_01	Pipestone Creek	Split Rock Creek to Minnesota border	*Escherichia coli*	2010	H	2014
SD-BS-R-SIXMILE_01	Six Mile Creek	Big Sioux River to S30, T112N, R48W	Fecal Coliform	2010	H	2016
SD-BS-R-SKUNK_01	Skunk Creek	Brandt Lake to Big Sioux River	TSS	2012	H	2016
SD-BS-R-UNION_01	Union Creek	Big Sioux River to confluence with East and West Forks	TSS	2008	H	2014
SD-CH-L-CENTER_01	Center Lake	Custer County	Temperature, water	2008	L	2018
SD-CH-L-COLD_BROOK_01	Cold Brook Reservoir	Fall River County	Temperature, water	2006	L	2018
SD-CH-L-DEERFIELD_01	Deerfield Lake	Pennington County	Temperature, water	2010	L	2022
SD-CH-L-HORSETHIEF_01	Horsethief Lake	Pennington County	Temperature, water	2006	L	2018
SD-CH-L-NEW_WALL_01	New Wall Lake	Pennington County	pH	2010	L	2022
SD-CH-L-SHERIDAN_01	Sheridan Lake	Pennington County	Oxygen, Dissolved	2006	L	2018
SD-CH-L-SHERIDAN_01	Sheridan Lake	Pennington County	Temperature, water	2006	L	2018
SD-CH-L-SYLVAN_01	Sylvan Lake	Custer County	Temperature, water	2008	L	2020
SD-CH-R-BATTLE_01	Battle Creek	Near Horsethief Lake to Teepee Gulch Creek	Temperature, water	2004	H	2018
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	Fecal Coliform	2010	H	2014
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	TSS	2010	H	2014
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	*Escherichia coli*	2012	H	2014
SD-CH-R-BATTLE_02	Battle Creek	Teepee Gulch Creek to SD HWY 79	Temperature, water	2004	H	2016
SD-CH-R-BATTLE_02	Battle Creek	Teepee Gulch Creek to SD HWY 79	*Escherichia coli*	2012	H	2011
SD-CH-R-BATTLE_02	Battle Creek	Teepee Gulch Creek to SD HWY 79	Fecal Coliform	2012	H	2011

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	Specific Conductance	2004	H	2016
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	TDS	2004	H	2016
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	Salinity	2006	H	2016
SD-CH-R-BEAVER_01_USGS	Beaver Creek	Near Buffalo Gap	Fecal Coliform	2010	L	2022
SD-CH-R-BEAVER_02_USGS	Beaver Creek	S13, T5N, R4E to SD Hwy 79	Temperature, water	2012	L	2018
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	TSS	2012	L	2024
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Specific Conductance	2004	H	2014
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	TDS	2004	H	2014
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	TSS	2004	H	2014
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Salinity	2008	H	2014
SD-CH-R-CHEYENNE_03	Cheyenne River	Fall River to Cedar Creek	TSS	2004	H	2014
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	TSS	2004	H	2014
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	Alkalinity, Carbonate as CaCO3	2010	H	2014
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	TDS	2010	H	2014
SD-CH-R-CHEYENNE_05	Cheyenne River	Belle Fourche River to Bull Creek	TSS	2004	H	2014
SD-CH-R-CHEYENNE_06	Cheyenne River	Bull Creek to Lake Oahe	TSS	2004	H	2013
SD-CH-R-ELK_01_USGS	Elk Creek	S9, T3N, R7E to S27, T4N, R3E	Temperature, water	2008	L	2020
SD-CH-R-FALL_01	Fall River	Hot Springs to mouth	Temperature, water	2004	H	2016
SD-CH-R-GRACE_COOLIDGE_01	Grace Coolidge Creek	S12, T3S, R3E to Battle Creek	Temperature, water	2004	H	2018
SD-CH-R-GRIZZLY_BEAR_01_USGS	Grizzly Bear Creek	Near Keystone, SD	Temperature, water	2006	H	2018
SD-CH-R-HIGHLAND_01_USGS	Highland Creek	Wind Cave Natl Park and near Pringle, SD	pH	2006	L	2018
SD-CH-R-HIGHLAND_01_USGS	Highland Creek	Wind Cave Natl Park and near Pringle, SD	Temperature, water	2006	H	2018
SD-CH-R-HOT_BROOK_01	Hot Brook Creek	Fall River to S19, T7S, R5E	Temperature, water	2006	L	2018
SD-CH-R-RAPID_03	Rapid Creek	Canyon Lake to S15, T1N, R8E	Temperature, water	2010	H	2016
SD-CH-R-RAPID_N_FORK_01	North Fork Rapid Creek	From confluence with Rapid Creek to S8, T3N, R3E	Temperature, water	2004	H	2016
SD-CH-R-SPRING_01	Spring Creek	S5, T2S, R3E to Sheridan Lake	Temperature, water	2008	H	2016
SD-CH-R-VICTORIA_01_USGS	Victoria Creek	Rapid Creek to S19, T1N, R6E	Temperature, water	1998	H	2016
SD-GR-L-ISABEL_01	Lake Isabel	Dewey County	Mercury	2006	D**	
SD-GR-L-ISABEL_01	Lake Isabel	Dewey County	Chlorophyll-a	2010	D**	
SD-GR-L-PUDWELL_01	Pudwell Dam	Corson County	Mercury	2010	D**	

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-GR-L-SHADEHILL_01	Shadehill Reservoir	Perkins County	Salinity	2004	D**	
SD-GR-R-BULL_01	Bull Creek	SF Grand River to S15, T21N, R5E	Salinity	2012	D**	
SD-GR-R-CROOKED_01	Crooked Creek	ND border to S34, T23N, R5E	Salinity	2012	D**	
SD-GR-R-GRAND_01	Grand River	Shadehill Reservoir to Corson County line	Temperature, water	2004	D**	
SD-GR-R-GRAND_01	Grand River	Shadehill Reservoir to Corson County line	Salinity	1998	D**	
SD-GR-R-GRAND_02	Grand River	Corson County line to Bullhead	Salinity	2004	D**	
SD-GR-R-GRAND_02	Grand River	Corson County line to Bullhead	TSS	2004	D**	
SD-GR-R-GRAND_03	Grand River	Bullhead to mouth	Fecal Coliform	2004	D**	
SD-GR-R-GRAND_03	Grand River	Bullhead to mouth	Salinity	2004	D**	
SD-GR-R-GRAND_03	Grand River	Bullhead to mouth	TSS	2004	D**	
SD-GR-R-GRAND_03	Grand River	Bullhead to mouth	*Escherichia coli*	2010	D**	
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	North Dakota border to Shadehill Reservoir	Salinity	2004	D**	
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	North Dakota border to Shadehill Reservoir	Specific Conductance	2004	D**	
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	Jerry Creek to Skull Creek	Salinity	2006	D**	
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	Jerry Creek to Skull Creek	TSS	2004	D**	
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	Skull Creek to Shadehill Reservoir	Salinity	2004	D**	
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	Skull Creek to Shadehill Reservoir	TSS	2004	D**	
SD-JA-L-BIERMAN_01	Bierman Dam	Spink County	Chlorophyll-a	2010	L	2022
SD-JA-L-BYRON_01	Lake Byron	Beadle County	pH	2010	L	2022
SD-JA-L-CARTHAGE_01	Lake Carthage	Miner County	Chlorophyll-a	2010	L	2022
SD-JA-L-CRESBARD_01	Cresbard Lake	Faulk County	pH	2010	L	2022
SD-JA-L-FAULKTON_01	Lake Faulkton	Faulk County	pH	2008	L	2020
SD-JA-L-FOUR_MILE_01	Four Mile Lake	Marshall County	pH	2012	L	2024
SD-JA-L-JONES_01	Jones Lake	Hand County	pH	2006	L	2018
SD-JA-L-LATHAM_01	Latham	Faulk County	Oxygen, Dissolved	2012	L	2024
SD-JA-L-LOUISE_01	Lake Louise	Hand County	pH	2008	L	2020
SD-JA-L-MINA_01	Mina Lake	Edmunds County	Oxygen, Dissolved	2012	L	2024
SD-JA-L-MITCHELL_01	Lake Mitchell	Davison County	pH	2012	L	2024

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-JA-L-NINE_MILE_01	Nine Mile Lake	Marshall County	pH	2010	L	2022
SD-JA-L-PIERPONT_01	Pierpont Lake	Day County	Temperature, water	2012	L	2024
SD-JA-L-RAVINE_01	Ravine Lake	Beadle County	Oxygen, Dissolved	2012	L	2024
SD-JA-L-REDFIELD_01	Lake Redfield	Spink County	Oxygen, Dissolved	2010	L	2022
SD-JA-L-SOUTH_BUFFALO_01	South Buffalo Lake	Marshall County	Oxygen, Dissolved	2010	L	2022
SD-JA-L-TWIN_01	Twin Lakes	Sanborn County	Chlorophyll-a	2010	L	2022
SD-JA-L-WILMARTH_01	Wilmarth Lake	Aurora County	Chlorophyll-a	2010	L	2022
SD-JA-L-WILMARTH_01	Wilmarth Lake	Aurora County	pH	2012	L	2022
SD-JA-R-FIRESTEEL_01	Firesteel Creek	West Fork Firesteel Creek to mouth	*Escherichia coli*	2010	L	2022
SD-JA-R-FOOT_01_USGS	Foot Creek	Near Aberdeen, SD	Oxygen, Dissolved	2012	H	2016
SD-JA-R-JAMES_01	James River	North Dakota border to Mud Lake Reservoir	Oxygen, Dissolved	2012	H	2016
SD-JA-R-JAMES_03	James River	Columbia Road Reservoir	Oxygen, Dissolved	2008	H	2020
SD-JA-R-JAMES_04	James River	Columbia Road Reservoir to near US HWY 12	Oxygen, Dissolved	2012	H	2016
SD-JA-R-JAMES_05	James River	US HWY 12 to Mud Creek	Oxygen, Dissolved	2006	H	2018
SD-JA-R-JAMES_06	James River	Mud Creek to James River Diversion Dam	Oxygen, Dissolved	2010	H	2016
SD-JA-R-JAMES_07	James River	James River Diversion Dam to Huron 3rd Street Dam	Oxygen, Dissolved	2012	H	2016
SD-JA-R-JAMES_08	James River	Huron 3rd St Dam to Sand Creek	TSS	2010	H	2016
SD-JA-R-JAMES_09	James River	Sand Creek to I-90	TSS	2004	H	2016
SD-JA-R-JAMES_10	James River	I-90 to Yankton County line	TSS	1998	H	2012
SD-JA-R-JAMES_11	James River	Yankton County line to mouth	TSS	2004	H	2016
SD-JA-R-MOCCASIN_02	Moccasin Creek	James River to S24, T123N, R64W	Oxygen, Dissolved	2008	H	2020
SD-JA-R-MUD_01	Mud Creek	James River to Hwy 37	Oxygen, Dissolved	2006	L	2018
SD-JA-R-PIERRE_01	Pierre Creek	James River to S11, T102N, R58W	*Escherichia coli*	2010	H	2016
SD-JA-R-SNAKE_01	Snake Creek	James River to confluence with SF Snake Creek	Oxygen, Dissolved	2006	H	2016
SD-JA-R-TURTLE_01	Turtle Creek	James River to S17, T113N, R65W	pH	2008	H	2020
SD-JA-R-WOLF_01	Wolf Creek	Wolf Creek Colony to S5, T103N, R56W	*Escherichia coli*	2012	H	2014
SD-JA-R-WOLF_02	Wolf Creek	Just above Wolf Creek Colony to the mouth.	*Escherichia coli*	2012	H	2016
SD-LM-R-LITTLE_MISSOURI_01	Little Missouri River	Montana border to North Dakota border	TSS	2010	L	2022
SD-MI-L-ANDES_01	Lake Andes	Charles Mix County	Oxygen, Dissolved	2006	L	2011

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-MI-L-CAMPBELL_01	Lake Campbell	Campbell County	Chlorophyll-a	2010	L	2022
SD-MI-L-CAMPBELL_01	Lake Campbell	Campbell County	pH	2010	L	2022
SD-MI-L-COTTONWOOD_01	Cottonwood Lake	Sully County	Chlorophyll-a	2010	L	2022
SD-MI-L-GEDDES_01	Geddes Lake	Charles Mix County	pH	2010	L	2022
SD-MI-L-HIDDENWOOD_01	Lake Hiddenwood	Walworth County	Oxygen, Dissolved	2012	L	2024
SD-MI-L-HURLEY_01	Lake Hurley	Potter County	Mercury	2006	H	2016
SD-MI-L-MCCOOK_01	McCook Lake	Union County	Temperature, water	2010	L	2022
SD-MI-L-POCASSE_01	Lake Pocasse	Campbell County	Chlorophyll-a	2010	L	2022
SD-MI-L-ROOSEVELT_01	Roosevelt Lake	Tripp County	Mercury	2006	H	2016
SD-MI-R-SHARPE_01	Missouri River (Lake Sharpe)	Oahe Dam to Big Bend Dam	Temperature, water	2010	H	2016
SD-MI-R-SPRING_01	Spring Creek	Lake Pocasse to US HWY 83	Oxygen, Dissolved	2006		2018
SD-MN-L-BIG_STONE_01	Big Stone Lake	Roberts County	Temperature, water	2012	L	2024
SD-MN-L-HENDRICKS_01	Lake Hendricks	Brookings County	pH	2010	L	2022
SD-MN-L-PUNISHED_WOMAN_01	Punished Woman Lake	Codington County	pH	2012	L	2024
SD-MN-R-LITTLE_MINNESOTA_01	Little Minnesota River	Big Stone Lake to S15, T128N, R52W	Oxygen, Dissolved	2012	L	2024
SD-MN-R-MUD_01	Mud Creek	SF Yellowbank R to S22, T118N, R48W	Oxygen, Dissolved	2012	H	2014
SD-MN-R-WHETSTONE_S_FORK_01	South Fork Whetstone River	Headwaters to Lake Farley	*Escherichia coli*	2012	H	2014
SD-MN-R-WHETSTONE_S_FORK_02	South Fork Whetstone River	Lake Farley to mouth	*Escherichia coli*	2012	H	2014
SD-MN-R-YELLOW_BANK_N_FORK_01	North Fork Yellow Bank River	SD/MN border to S27, T120N, R48W	*Escherichia coli*	2012	H	2014
SD-MN-R-YELLOW_BANK_S_FORK_01	South Fork Yellow Bank River	SD/MN border to S33, T118N, R49W	*Escherichia coli*	2012	H	2014
SD-MU-L-COAL_SPRINGS_01	Coal Springs Reservoir	Perkins County	Mercury	2012	D**	
SD-MU-L-COAL_SPRINGS_01	Coal Springs Reservoir	Perkins County	pH	2012	D**	
SD-MU-R-MOREAU_01	Moreau River	North and South Forks to Ziebach/Perkins county line	TSS	2006	D**	
SD-MU-R-MOREAU_01	Moreau River	North and South Forks to Ziebach/Perkins county line	Salinity	1998	D**	
SD-MU-R-MOREAU_02	Moreau River	Ziebach/Perkins county line to Green Grass	Salinity	1998	D**	
SD-MU-R-MOREAU_02	Moreau River	Ziebach/Perkins county line to Green Grass	TSS	1998	D**	

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-MU-R-MOREAU_03	Moreau River	Green Grass to mouth	TSS	2004	D**	
SD-MU-R-MOREAU_03	Moreau River	Green Grass to mouth	Fecal Coliform	2006	D**	
SD-MU-R-MOREAU_03	Moreau River	Green Grass to mouth	*Escherichia coli*	2010	D**	
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	Alkali Creek to mouth	TDS	2004	D**	
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	Alkali Creek to mouth	Specific Conductance	1998	D**	
SD-NI-L-RAHN_01	Rahn Lake	Tripp County	Chlorophyll-a	2010	L	2022
SD-VM-L-E_VERMILLION_01	East Vermillion Lake	McCook County	Chlorophyll-a	2010	L	2022
SD-VM-L-E_VERMILLION_01	East Vermillion Lake	McCook County	Temperature, water	2012	L	2022
SD-VM-L-SILVER_01	Silver Lake	Hutchinson County	pH	2010	L	2022
SD-VM-R-LONG_01	Long Creek	Vermillion River to Highway 44	Fecal Coliform	2008	H	2016
SD-VM-R-LONG_01	Long Creek	Vermillion River to Highway 44	*Escherichia coli*	2010	H	2016
SD-VM-R-VERMILLION_E_FORK_01	East Fork Vermillion River	McCook/Lake County line to Little Vermillion River	Fecal Coliform	2010	H	2016
SD-VM-R-VERMILLION_E_FORK_01	East Fork Vermillion River	McCook/Lake County line to Little Vermillion River	Oxygen, Dissolved	2012	H	2016
SD-VM-R-VERMILLION_E_FORK_02	East Fork Vermillion River	Little Vermillion River to mouth	*Escherichia coli*	2010	H	2016
SD-VM-R-VERMILLION_WEST_FORK_01_USGS	West Fork Vermillion River	Vermillion River to McCook-Miner County Line	Fecal Coliform	2010	H	2016
SD-VM-R-VERMILLION_WEST_FORK_01_USGS	West Fork Vermillion River	Vermillion River to McCook-Miner County Line	*Escherichia coli*	2010	H	2016
SD-WH-R-LITTLE_WHITE_01	Little White River	Rosebud Creek to mouth	Fecal Coliform	2010	L	2022
SD-WH-R-LITTLE_WHITE_01	Little White River	Rosebud Creek to mouth	*Escherichia coli*	2012	L	2022
SD-WH-R-WHITE_01	White River	NE/SD border to Willow Creek	*Escherichia coli*	2010	H	2014
SD-WH-R-WHITE_01	White River	NE/SD border to Willow Creek	Fecal Coliform	2010	H	2014
SD-WH-R-WHITE_02	White River	Willow Creek to Pass Creek	Fecal Coliform	2004	H	2014
SD-WH-R-WHITE_02	White River	Willow Creek to Pass Creek	*Escherichia coli*	2010	H	2014
SD-WH-R-WHITE_02	White River	Willow Creek to Pass Creek	Salinity	2010	L	2016
SD-WH-R-WHITE_03	White River	Pass Creek to Little White River	Fecal Coliform	2004	H	2014
SD-WH-R-WHITE_03	White River	Pass Creek to Little White River	Salinity	2010	L	2016
SD-WH-R-WHITE_03	White River	Pass Creek to Little White River	*Escherichia coli*	2012	H	2014
SD-WH-R-WHITE_04	White River	Little White River to confluence with Missouri River	Fecal Coliform	2004	H	2014

AUID	Waterbody	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-WH-R-WHITE_04	White River	Little White River to confluence with Missouri River	*Escherichia coli*	2010	H	2014

D** - TMDL development deferred to EPA

APPENDIX E

PUBLIC COMMENTS

Comment from the United States Evironmental Protection Agency, Region 8:

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

FEB 28 2012

Ref: 8EPR-EP

Shannon Minerich
Surface Water Quality Program
Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501-3181

Re: 2012 South Dakota Integrated Report

Dear Ms. Minerich:

We have reviewed the Department's draft 2012 Integrated Report (IR) for Surface Water Quality Assessment and appreciate the opportunity to provide feedback. With communications occurring early in the review process, key information was discussed allowing for a common understanding of issues. The Department's draft IR is well organized, and we commend your efforts to utilize common sense language when possible. These updates make for an easily readable document that is clear and concise, providing ample opportunity to share with a broad audience. We found that information in the Report, the Assessment Database (ADB), and GIS files are mostly consistent.

We have some additional comments that should be addressed prior to finalizing the document, these can be found in the Attachment. We look forward to receiving your final 2012 IR, and continuing our cooperative efforts. If you have any questions or wish to discuss these comments further please contact me at (303) 312-6974. Again, thank you for your commitment and hard work on the 2012 Integrated Report.

Sincerely,

Elizabeth Rogers
Monitoring and Assessment Team
Water Quality Unit
Ecosystems Protection Program

Attachment

Attachment

Comments on South Dakota's 2012 Draft Integrated Report

General Comments:

Page 8: Good to see clarification on the perennial wadable streams Reference Site Network, including the addition of a 4th tier in the validation process for biological health. Also the development of a "Biological Monitoring Toolkit", as well as development of a state-wide macroinvertebrate and stream fish reference collection & database.

Specific Comments:

Category 5 & 303(D) Appendix D Crosscheck:

Page 86: Battle Creek (SD-CH-R-BATTLE_01) is listed in Category 5 as impaired within the Cheyenne River Basin Table 25, but is not on the 303(d) Summary List, Appendix D.

Page 90: Grace Coolidge Creek (SD-CH-R-GRACE_COOLIDGE_01) is listed in Category 5 as impaired within the Cheyenne River Basin Table 25, but is not on the 303(d) Summary List, Appendix D.

Page 98: Grand River, South Fork (SD-GR-R-GRAND_S_FORK_01) is listed in Category 5 with two causes (salinity & TSS). Both causes are listed in Table 26 but only TSS is listed as a cause on the 303(d) Summary List, Appendix D, salinity is missing.

Page 107: James River (SD-JA-R-JAMES_08) is listed in Category 5 as impaired within the James River Basin Table 27, but is not on the 303(d) Summary List, Appendix D.

Page 116: South Fork Whetstone River (SD-MN-R-WHETSTONE_S_FORK_01) is listed in Category 5 as impaired within the Minnesota River Basin Table 29, but is not on the 303(d) Summary List, Appendix D.

Page 138: West Fork Vermillion River (SD-VM-R-VERMILLION_WEST_FORK_01_USGS) is listed in Category 5 with two causes (Fecal Coliform & E.coli). Both causes are listed in Table 34 but only Fecal Coliform is listed as a cause on the 303(d) Summary List, Appendix D, E.coli is missing.

Page 193: Beaver Creek (SD-CH-R-BEAVER_02_USGS) is on the 2012 303(d) List for temperature as one of the impairment causes. Cycle first listed is 2006, yet this cause is not on the 2010 303(d) list. If this is a new cause in the 2012 cycle, please update the Cycle First Listed column to 2012.

DENR Response:
This has been corrected in Appendix D.

Delisting (Appendix B):

-Beaver Creek (SD-CH-R-BEAVER_01) is proposed as a delist of two causes. Fecal Coliform has an approved TMDL where as TSS does not have an associated TMDL. Please specify reason for TSS delist.

-Lake Creek (SD-WH-R-LAKE_01_USGS) the only cause for impairment listed is temperature. Lake Creek is still listed as Category 5 in Appendix B, is there a new cause of impairment in 2012?

-West Strawberry Creek (SD-BF-R-W_STRAWBERRY_01) delist reason appears incorrect, as a TMDL for Fecal Coliform was approved on 4-6-2011.

-Whitewood Creek (SD-BF-R-WHITEWOOD_03) delist reason appears incorrect, as a TMDL for E.coli and Fecal Coliform was approved on 7-28-2011.

-Brule Creek (SD-BS-R-BRULE_01) delist reason appears incorrect, as a TMDL for Fecal Coliform was approved on 6-2-2011.

-Beaver Creek (SD-CH-R-BEAVER_01) delist reason appears incorrect, as a TMDL for Fecal Coliform was approved on 3-12-2010.

-James River (SD-JA-R-JAMES_11) delist reason appears incorrect, as a TMDL for Fecal Coliform was approved on 3-24-2011.

-Choteau Creek (SD-MI-R-CHOTEAU_01) delist reason appears incorrect, as a TMDL for TSS was approved on 5-3-2010.

-Moccasin Creek (SD-JA-R-MOCCASIN_02) was on the 2010 303(d) list as impaired for ammonia for warmwater marginal fish life. The 2012 303(d) list (Table 27, page 107) does not include the ammonia impairment, nor does the delisting table mention removal of this impairment. Please add ammonia back to the 2012 list, Table 27, or include it on the delisting table and specify a reason for removal from the list.

-Pipestone Creek (SD-BS-R-PIPESTONE_01) was on the 2010 303(d) list as impaired for fecal coliform for limited contact recreation and immersion recreation. The 2012 303(d) list (Table 24, page 79) includes fecal coliform for immersion recreation only. Please specify a reason for removing the fecal coliform, limited contact use impairment.

-Rosehill Lake (SD-JA-L-ROSEHILL_01) is delisted in 2012 for dissolved oxygen. Within Appendix B (Delisting Table, page 176) please expand the delisting reason to "Other; Dam Breach", or similar terminology to clarify the unique situation with this delisting.

DENR Response:

Beaver Creek (SD-CH-R-BEAVER_01): Fecal coliform and TSS were delisted because water quality standards were met. The EPA approved fecal coliform TMDL would only be used as a delist reason if fecal coliform were not supporting water quality standards. Both parameters meet water quality standards.

Lake Creek (SD-WH-R-LAKE_01_USGS): Lake Creek is Category 1. This has been corrected in Appendix B.

West Strawberry Creek (SD-BF-R-W_STRAWBERRY_01): The delist reason is correct. Fecal coliform in West Strawberry Creek was delisted for meeting water quality standards. The EPA approved fecal coliform TMDL would only be used as a delist reason if water quality standards were not met for fecal coliform.

Whitewood Creek (SD-BF-R-WHITEWOOD_03): The delist reason is correct. E. coli was delisted due to EPA approval of a TMDL. Fecal coliform was delisted because water quality standards were met. Although there is also an approved TMDL for fecal coliform, this delist reason would only be used if water quality standards were not met for fecal coliform.

Brule Creek (SD-BS-R-BRULE_01): The delist reason is correct. Fecal coliform was delisted because water quality standards were met. Although there is an EPA approved fecal coliform TMDL, this delist reason would only be used if water quality standards were not met for fecal coliform. Brule Creek is Category 1 – all uses met.

James River (SD-JA-R-JAMES_01): The delist reason is correct. Fecal coliform was delisted because water quality standards were met. Although there is an EPA approved fecal coliform TMDL, this delist reason would only be used if water quality standards were not met for fecal coliform.

Choteau Creek (SD-MI-R-CHOTEAU_01): The delist reason is correct. TSS was delisted because water quality standards were met. The EPA approved TMDL would only be used as a delist reason if water quality standards were not met for TSS. Choteau Creek is Category 1 – all uses met.

Moccasin Creek (SD-JA-R-MOCCASIN_02): Moccasin Creek was on the 2010 303(d) list due to dissolved oxygen and pH impairment. Although ammonia was not supporting in 2010, it was not on the 303(d) list. An ammonia point source TMDL was approved for this segment of Moccasin Creek in 2001. The ammonia TMDL was immediately tied to the cause, placing ammonia in Category 4a (not Category 5, thus never on the 303(d)). In 2012, water quality standards were met for ammonia and ammonia was removed as a cause. However, ammonia did not need to be delisted because it had never been on the 303(d) list.

Pipestone Creek (SD-BS-R-PIPESTONE_01): In 2012, water quality standards were met for limited contact recreation but not for immersion recreation (different fecal coliform criterion). In ADB, when the use support is changed from "not supporting" to "fully supporting," the cause is also removed from that designated use.

Rosehill Lake (SD-JA-L-ROSEHILL_01): The delisting reason has been updated in Appendix B to "Other: dam breach".

The details covered within the individual basin narratives compared to Appendix B, have identified some delistings that are not adequately explained. Overall it would be helpful if the delistings below were described further in the basin narratives, similar to Rosehill Dam and Blue Dog Lake. There are four delisting reasons listed below that need more explanation. This addition will provide adequate clarification to readers of the Integrated Report, and will provide transparency for all delistings.

1) Applicable WQS attained; reason for recovery unspecified (please explain)

-Horse Creek	(SD-BF-R-HORSE_01_USGS)
-Bullhead Lake	(SD-BS-L-BULLHEAD_01)
-Big Sioux River	(SD-BS-R-BIG_SIOUX_06)
-Brule Creek	(SD-BS-R-BRULE_01) TSS
-Curlew Lake	(SD-CH-L-CURLEW_01)
-Battle Creek	(SD-CH-R-BATTLE_01_USGS)
-Beaver Creek	(SD-CH-R-BEAVER_01) TSS
-Cheyenne River	(SD-CH-R-CHEYENNE_02B)
-French Creek	(SD-CH-R-FRENCH_01)
-Spring Creek	(SD-CH-R-SPRING_02)
-Firesteel Creek	(SD-JS-R-FIRESTEEL_01)
-James River	(SD-JA-R-JAMES_01)
-James River	(SD-JA-R-JAMES_02)
-Moccasin Creek	(SD-JS-R-MOCCASIN_02)
-Swan Lake	(SD-VM-L-SWAN_01)

2) Applicable WQS attained; threatened water no longer threatened (please explain)

-S. Fork Whetstone River	(SD-MN-R-WHETSTONE_S_FORK_02)
-Moreau River	(SD-MU-R-MOREAU_03)
-Thunder Butte Creek	(SD-MU-R-THUNDER_BUTTE_01)

3) Applicable WQS attained; according to new assessment method
(Please identify the new assessment method and explain)

-Willow Creek	(SD-BF-R-WILLOW_01_USGS)
-Bitter Lake	(SD-BS-L-BITTER_01)

4) Applicable WQS attained; due to change in WQS
(Please explain the standards change that resulted in these delistings for each cause)

-Cheyenne River	(SD-CH-R-CHEYENNE_01)
-Horsehead Creek	(SD-CH-R-HORSEHEAD_01_USGS)

DENR Response:
DENR only provides detailed delisting reasons within the basin narratives for unique delisting situations (i.e. dam breach). DENR does not intend to explain each delisting in detail in the basin narratives. The delisting reasons used by DENR are provided and limited by EPA in the Assessment Database (ADB). Additional language has been included on page 21 to provide examples and clarification for some standard ADB delisting reasons applicable to South Dakota waters for this 2012 Integrated Report.

1) *Applicable WQS attained; reason for recovery unspecified. These waterbodies have all been delisted because water quality monitoring indicates water quality standards are being met, however the specific reason for recovery is not known. The waterbody may now be meeting water quality standards for a variety of reasons including: a greater quantity of sampling data is available and indicates full support, changes in the hydrologic cycle have improved the condition, and others.*
2) *Applicable WQS attained; threatened waters no longer threatened. As indicated on page 25, DENR uses the threatened flag in situations where waterbody support is borderline, a trend indicates possible future impairment, proposed watershed activities may cause future impairments, the waterbody is considered impaired for other reasons (consumption advisory), or based on best professional judgment. The threatened flag places waterbodies in Category 5 and on the 303(d) list. When waterbodies are delisted because WQS are attained and the waterbody is no longer threatened, this means the original reason for using the threatened flag no longer exists and the threatened status is no longer necessary.*
3) *Applicable WQS attained; according to new assessment method. Assessment methods have not changed for the 2012 cycle. The delisting reason for Willow Creek has been updated in ADB and Appendix B to Applicable WQS attained; due to change in WQS. The delisting reason for Bitter Lake is Applicable WQS attained; reason for recovery unspecified. This delisting reason was correct in ADB but incorrect in the delisting table; it has been updated in the delisting table.*
4) *Applicable WQS attained; due to change in WQS. In 2009, the Surface Water Quality Standard for low quality fisheries and irrigation waters (74:51:01:30) was modified to include the irrigation beneficial use designation. This standard set minimum flow requirements for the applicability of certain water quality standards. The causes delisted for this reason were based on this water flow requirement.*

ADB & IR Review:

Page 38 of the I.R. shows Table 11, Individual Use Support Summary for Rivers and Streams. Row 3 of the chart for Coldwater Permanent Fish Life has miles fully supporting as 405. Per the ADB report it states that 406.94 miles are fully supporting, so with the rounding factor, the IR table should have 407 miles fully supporting instead of 405.

DENR Response:
This table has been updated to reflect 407 miles as fully supporting for coldwater permanent fish life propagation waters.

GIS Review:

-Newell Lake (SD-BF-L-NEWELL_01) is on the 303(d) list in the IR, but the GIS file states it is in Category 2.

-Beaver Creek (SD-BS-R-BEAVER_02) cannot be found within the GIS files, it is listed as Category 4A in the IR.

-S. Fork of Whetstone River (SD-MN-R-WHETSTONE_S_FORK_02) is on the 303(d) list in the IR, but cannot be found within the GIS files.

-S. Fork Yellow Bank River (SD-MN-R-YELLOW_BANK_S_FORK_01) is on the 303(d) list in the IR, but cannot be found within the GIS files.

-Little Moreau No.1 (SD-MU-L-LITTLE_MOREAU_NO_01) is listed in the IR as Category 1, but cannot be found in the GIS files.

-Sawmill Canyon (SD-WH-R-SAWMILL_CANYON_01_USGS) is listed in the IR as Category 3, but cannot be found in the GIS files.

DENR Response:
Little Moreau No. 1 and Sawmill Canyon have been added to the GIS file. The other waterbodies are correct in the GIS file.

Fish Consumption Restrictions:

Table 40 on page 152 (Waterbodies Affected by Fish and Shellfish Consumption Restrictions) of the IR matches the 303(d) report for Category 5 waters with the exception of Newell Lake. Newell Lake (SD-BF-L-NEWELL_01) is on the 303(d) list with mercury in fish tissue as the cause, but is not listed in Table 40. Also, DENR's website with fish consumption advisories is missing Newell Lake as having this advisory.

DENR Response:
Newell Lake has been added to the table.

IR Narrative Comments:

EPA would like to see a summary table added to the IR that breaks out assessment categories for waterbody type (lakes vs. rivers/streams), along with applicable size/mileage. This report is already available through ADB (Single Reporting Category Summary), and would be a great addition to the IR.

DENR Response:
Although this is not an IR requirement, these tables have been added to the document.

Page 7: It would be helpful if somewhere in the "Fixed Station Ambient Monitoring" section a reference should be inserted for the SAP/QAPP that governs this monitoring work. Please also add a similar reference in the lakes monitoring section.

DENR Response:
DENR's QMP, program QAPPs, and SOPs are discussed in the Methodology Section.

Page 29: (Lakes 303(d) Listing Methodology) second paragraph states that:

> "DENR does not currently have a definitive method for addressing narrative standards and, therefore, relies on available water quality data, public opinion, and professional judgment to make listing decisions related to narrative standards when appropriate."

Region 8 recommends that DENR set a specific goal within the IR of bridging this interpretative gap in the near future. This type of statement would provide clarification that DENR is seeking a definitive process to clearly and transparently interpret their narrative standards for making listing decisions of lakes in South Dakota. It is important for DENR and other state environmental departments to clearly describe their assessment processes to all readers as part of their Assessment Methodology of surface waters.

DENR Response:

Developing an interpretative process for narrative standards associated with eutrophication to make lake listing decisions in South Dakota will be complex. Many lakes exhibit high phosphorus concentrations not often correlated with algae production or other eutrophication factors. This concept is documented in EPA's 2007 National Lakes Assessment report which states "In the Northern Plains ecoregion, the traditional limnological concept that biomass production is controlled simply by nutrient concentrations may not apply."

DENR is currently reviewing information and exploring options for consideration of a process for addressing narrative standards associated with lake eutrophication. DENR continues to communicate with EPA to gain technical guidance and stay informed on interpretative processes being developed in Region 8. In addition, DENR is exploring potential research opportunities with established lake ecology partners. The primary focus is on research efforts that answer questions related to primary production and indicators of trophic state for lakes in the Northern Glaciated Plains ecoregion of eastern South Dakota. DENR will evaluate all information gained for future consideration in decision making processes related to narrative standards.

The language on page 28 was revised to provide clarification concerning the department's status for developing a process to interpret narrative standards for making lake listing decisions in South Dakota.

Page 35: First paragraph, the IR describes the process for beach closures. The 2010 IR listed specific Fecal Coliform thresholds for closing a beach, the 2012 IR has removed these specific thresholds. Is there a reason these specific levels are no longer listed? Please include a brief clarification on who is responsible for beach closures and what approach the closures are based upon.

DENR Response:

During the 2010 legislative session the SD legislature passed a bill which removed DENR's authority to regulate public beach closures. Bacteria data collection and decisions related to public beach closures became the responsibility of the individual management agency. Therefore, the Fecal Coliform thresholds were removed from the listing methodology on page 34. Refer to the section on Unsafe Beaches, page 149, for more information concerning beach closure information for the 2012 IR.

Page 44: Second paragraph, second sentence states that "Results of the 2012 analysis show 10% of waterbodies violated the DO standard in the lower half of the water column." It appears that 2012 is a typo and should state 2011 instead.

DENR Response:

The 2012 analysis refers to the analyses conducted for the 2012 Integrated Report. This paragraph was slightly revised to provide clarification.

Page 70: First Paragraph, Blue Dog Lake was listed for the specific causes of E.coli and pH. It is understood based on previous discussions that Blue Dog Lake will be delisted in 2012 for E.coli, and listed as Category 3 for insufficient data. DENR plans to collect bacterial data in 2012 and 2013 to fill the bacterial data gap. It is also states that data is currently insufficient for pH as well. Region 8 recommends that DENR collect pH data along with bacterial data in 2012 and 2013 so that both data gaps are filled, and a solid assessment of Blue Dog Lake can be made for both causes during the 2014 IR cycle.

DENR Response:

Bacteria sampling on Blue Dog Lake will be incorporated into the statewide lake bacteria monitoring effort during the 2012 and 2013 recreation season. Statewide bacteria sampling is conducted independent from other lake monitoring efforts due to holding times (24 hours) associated with laboratory analysis. In addition, lake bacteria samples are collected from boat docks or other high frequency public access areas (swimming areas) from shore. Based on standard operating procedures, pH is collected at multiple locations within the lake basin. Personnel collecting bacteria samples will not have access to boats to collect pH measurements and will only be collecting bacteria samples from docks or shoreline areas.

DENR is participating in EPA's National Lake Assessment in 2012 and has other sampling obligations that will require significant time and resources. It is unlikely that field crews will be able to conduct sampling specifically on Blue Dog Lake to acquire the necessary pH data required to make support determinations and impairment decisions before the 2014 reporting cycle. Blue Dog Lake is included in the subset of lakes assessed by DENR as part of the Statewide Lakes Assessment project. Because the sampling design is based on a random design it is uncertain when the lake will be scheduled for sampling. In any respect, DENR will consider Blue Dog Lake a priority for sampling as time and resources permit.

Page 96 & 127: In the last paragraphs of the Grand River and Moreau River Basin narrative sections, each clarifies jurisdictional coverage of TMDL responsibilities between DENR and

EPA. This separation of duties was explained in the 2010 IR's as: "DENR has referred TMDL development for waterbodies under tribal jurisdiction in the Grand and Moreau River basins to EPA". The draft 2012 IR contains a revised statement: "DENR has referred TMDL development for all waterbodies in the Grand River and Moreau River basins to EPA." It has been a common understanding between EPA and DENR that EPA is responsible for TMDL development within the tribal boundaries of these two basins, and DENR is responsible for TMDL development for all other South Dakota state lands. If DENR is proposing a change in this jurisdictional coverage, EPA requests to have a separate conversation with DENR to discuss this change in TMDL responsibilities. If this jurisdictional coverage was not intended to be changed, please revise this language back to the 2010 IR jurisdictional explanation for these two basins.

DENR Response:

*The referenced language in the 2010 IR regarding the transfer of TMDL development responsibilities in the Grand and Moreau basin was inaccurate. The language was revised in the 2012 IR to accurately depict DENR's transfer of TMDL responsibilities for **all** waterbodies in the Grand and Moreau basins to EPA. The basis for this revised statement is documented in a formal letter (attached below) sent by DENR to EPA Region 8, declaring that the department would not be completing any TMDLs in the Grand and Moreau River basins for explicit reasons. DENR is in the process of discussing this transfer in TMDL responsibility with EPA. Therefore, a statement was added to the Grand and Moreau basin narrative sections to denote that communications between both agencies are ongoing with regards to this transfer in TMDL responsibilities.*

DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES
PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

August 22, 2008

Karen Hamilton
US EPA Region 8 – 8EPR-EP
Water Quality Unit
1595 Wynkoop Street
Denver, CO 80202-1129

Dear Ms. Hamilton,

Due to other resource commitments, the South Dakota Department of Environment and Natural Resources (DENR) will not be completing any TMDLs in the Grand and Moreau River basins. Some of the TMDL segments were initially listed in 1998 while other segments were listed in following years. There are currently impairment listings for all the main stem segments of both basins (see attachment). There are three years left to complete the initial impaired watershed segments (listed in 1998) within the EPA specified 13-year time frame.

With this action, DENR plans on removing the listed segment/parameters from the WQ-8 pace commitment. The reduced pace will also help South Dakota in meeting its TMDL targets.

Sincerely,

Dave Templeton, Director
Division Financial and Technical Assistance

Attachment

Grand and Moreau River 303(d) Segments

ASSESSMENT_UNIT	Impairment	DENR Status	Initial Listing	Basin Name
SD-GR-L-ISABEL_01	FCA	Not Initiated	2004	Grand
SD-GR-L-ISABEL_01	TSI	Not Initiated	1998	Grand
SD-GR-L-SHADEHILL_01	Chlorides	Not Initiated	2004	Grand
SD-GR-L-SHADEHILL_01	TDS	Not Initiated	2004	Grand
SD-GR-L-SHADEHILL_01	SAR	Not Initiated	2002	Grand
SD-GR-R-GRAND_01	SAR	Not Initiated	2004	Grand
SD-GR-R-GRAND_01	pH	Not Initiated	1998	Grand
SD-GR-R-GRAND_02	TSS	Not Initiated	2004	Grand
SD-GR-R-GRAND_02	SAR	Not Initiated	2004	Grand
SD-GR-R-GRAND_03	SAR	Not Initiated	2004	Grand
SD-GR-R-GRAND_03	TSS	Not Initiated	1998	Grand
SD-GR-R-GRAND_03	Fecal	Not Initiated	1998	Grand
SD-GR-R-GRAND_03	Temp	Not Initiated	2006	Grand
SD-GR-R-GRAND_N_FORK_01	SAR	Not Initiated	2002	Grand
SD-GR-R-GRAND_N_FORK_01	Cond	Not Initiated	2004	Grand
SD-GR-R-GRAND_S_FORK_01	TSS	Not Initiated	2004	Grand
SD-GR-R-GRAND_S_FORK_01	SAR	Not Initiated	2006	Grand
SD-GR-R-GRAND_S_FORK_02	TSS	Not Initiated	1998	Grand
SD-GR-R-GRAND_S_FORK_02	SAR	Not Initiated	2002	Grand
SD-MU-L-DEWBERRY_01	TSI	Not Initiated	1998	Moreau River
SD-MU-R-MOREAU_01	SAR	Not Initiated	2004	Moreau River
SD-MU-R-MOREAU_01	TSS	Not Initiated	2006	Moreau River
SD-MU-R-MOREAU_02	TSS	Not Initiated	2004	Moreau River
SD-MU-R-MOREAU_02	SAR	Not Initiated	2006	Moreau River
SD-MU-R-MOREAU_03	Fecal	Not Initiated	2006	Moreau River
SD-MU-R-MOREAU_03	TSS	Not Initiated	1998	Moreau River
SD-MU-R-MOREAU_03	SAR	Not Initiated	2002	Moreau River
SD-MU-R-MOREAU_S_FORK_01	Cond	Not Initiated	2004	Moreau River
SD-MU-R-THUNDER_BUTTE_01	DO	Not Initiated	2006	Moreau River

Page 146: Table 36 summarizes total waterbody size affected by toxics. For rivers, the size with elevated levels of toxics changed from 46 miles in the 2010 IR to 2 miles in the 2012 IR. The only delisting for toxics in 2012 is for Strawberry Creek (SD-BF-R-STRAWBERRY_01), and according to ADB this stream length is only 1.58 miles. This small segment does not explain the difference of almost 44 miles. Please explain or correct this discrepancy.

DENR Response:

This table summarizes total waterbody size not supporting toxic water quality standards. The table does not differentiate between a waterbody that is not supporting with an approved TMDL (Category 4a) or not supporting without an approved TMDL (Category 5). In the 2010 IR, 2 (1.58) miles were affected by toxics on Strawberry Creek and 44 miles were affected by ammonia on Moccasin Creek. The ammonia on Moccasin Creek was in multiuse Category 4a. In 2012, ammonia in Moccasin Creek was meeting water quality standards and moved to multiuse Category 1. Because the multiuse category for ammonia in Moccasin Creek went from 4a to 1, the cause did not require delisting.

Page 178: In Appendix C, the summary of ambient water quality monitoring by station number is missing the analysis group for some stations. Please check and correct for completeness.

DENR Response:

This has been corrected.

Comment from Valero Energy Corporation:

February 29, 2012

VIA E-MAIL

Department of Environment and Natural Resources
C/O Shannon Minerich
Surface Water Quality Program
523 East Capitol Avenue – Joe Foss Building
Pierre, South Dakota 57501-3181

Re: South Dakota Draft 2012 Integrated Waterbody Report

Dear Ms. Minerich:

Valero Renewables ("Valero") appreciates this opportunity to provide comment on the draft 2012 Integrated Report. As a guiding document for the establishment of Total Maximum Daily Load (TMDLs) for many waterbodies throughout the state, this information will significantly influence regulatory requirements and permit conditions for a wide variety of industries throughout the state. Valero Renewables owns and operates an Ethanol production facility near Aurora, S.D. and will ultimately be impacted by any TMDL standards or implementing regulations derived from this report.

The draft integrated report is a highly technical document over 200 pages in length. While Valero appreciates the 30 day comment period provided by the state, we do not believe this is sufficient time to fully review the proposed standards, controllable parameters, beneficial use classification, sampling methodology, or the determination criteria for any of the above. We are currently in review of this document for impact to our operations; however, additional time to fully assess this report is necessary to provide detailed and informed comments. As this document will serve as the foundation for future rulemaking, Valero reserves the right to comment further on this report as our assessment continues, even to the extent of providing comments on any future, draft regulations that relied on information and conclusions from this report.

Valero looks forward to the development of TMDL standards that are reasonable, technically feasible, cost effective, and do not unreasonably burden industry. Please contact me at (210) 345-4620 should you have any questions or need clarifications concerning our comments.

Sincerely,

Matthew H. Hodges
Director, Regulatory Affairs
Valero Companies

Valero Energy Corporation • One Valero Way • San Antonio, Texas 78249-1616
Post Office Box 696000 • San Antonio, Texas 78269-6000 • Telephone (210) 345-2000

DENR Response:

DENR appreciates Valero's comments and encourages participation by the regulated community. DENR acknowledges the impact of the 303(d) list and subsequent TMDLs to industry and other point source dischargers. DENR is committed to working with the regulated community to ensure that TMDLs do not place unreasonable burden on industry while making sufficient reductions to ensure water quality standards are met and the environment is protected.

DENR seeks comments on the 2012 draft report; however the subject content under review is limited to methodology and waterbody support status. The Integrated Report process uses existing water quality standards and beneficial use designations. Those are not under review in this report.

The Integrated Report combines 305(b) and 303(d) requirements of the Federal Water Pollution Control Act. The report due date is April 1 of even numbered years (2012) and specified in the Federal Water Pollution Control Act. This due date is a federal requirement. Therefore, comments will only be accepted and considered during the public comment period that ended on March 1, 2012. After EPA approval, DENR will not be able to make any changes to the report or supporting files (GIS, ADB, etc.).

Changes to water quality standards, which includes changes to beneficial use designations, occurs during DENR's triennial review process. The next triennial review will occur in the fall of 2012. Public comments will be solicited and considered during that time.

Comment from Black Hills National Forest, Deanna Reyher:

Various Forest employees looked through the report and didn't really have comments this year. Just perhaps a suggestion for inclusion in Section III For the final version, if appropriate. Status and information has been provided in that section on a variety of monitoring and investigations for various areas of the state. Would it be possible to include a few paragraphs on the temperature investigations/assessment update for the Black Hills streams, beneficial uses, who is working on it, what has been determined, etc.? Thanks. Deanna

Deanna Reyher
Forest Soil Scientist
Forest Watershed Coordination
Black Hills National Forest
605-673-9348
dreyher@fs.fed.us

DENR Response:

A brief description of the Black Hills Regional Stream Temperature Assessment has been included in the Belle Fourche (page 62) and Cheyenne River (page 84) basin narratives. Thank you for this suggestion.

Comment from Prairie Hills Audubon Society, Nancy Hilding:

Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788
Black Hawk, SD 57718
nhilshat@rapidnet.com,

Nancy Hilding
6300 West Elm
Black Hawk, SD 57718
March 1, 2012

Shannon Minerich
Shannon.Minerich@state.sd.us
Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue – Joe Foss Building
Pierre, South Dakota 57501-3181

Dear Shannon Minerich,

On page three you discuss wetland drainage, saying: *"Because drainage activities primarily focus on small, isolated, non-navigable wetlands, most do not fall under Clean Water Act jurisdiction or other federal protection. In South Dakota, drainage issues are extensive and therefore, managed at the county or township level."* If drainage tiles are used to drain, would not the end points of tiles be point sources, and the material released need an NPDES permit and thus fall under CWA jurisdiction?

On page 6 you write:

> "Water quality standards were first established for all surface waters by the state's Committee on Water Pollution in 1967. The Water Management Board completed the final steps of its most recent triennial review and revisions on March 11, 2009. The Interim Legislative Rules Review Committee approved these revisions on April 21, 2009. EPA formally approved South Dakota's water quality standards revisions on August 19, 2009. The water quality standards consist of water quality criteria necessary to protect those beneficial uses and an antidegradation policy that protects existing uses and high quality water."

It has been three years since March 2009, isn't it time for another triennial review? Does SD still not have any Outstanding State Resource Waters? I think at the Triennial Review in 2009, they delayed acting on this issue. Have they reviewed the issue and adopted any since 2009? If not the Water Management Board needs to assign some waters to this category.

DENR Response:

The definition of "point source" in Section 502 of the Federal Water Pollution Control Act excludes agricultural stormwater discharges and return flows from irrigated agriculture.

DENR's next triennial review is scheduled for the fall of 2012.

There are currently no South Dakota waterbodies with the Outstanding State Resource Waters designation. As per ARSD 74:51:01:39, anyone wishing to nominate outstanding state resource waters shall follow petition requirements outlined in SDCL 1-26-13.

You write on page 7:

> "The most commonly sampled parameters include fecal coliform, E. coli, hardness, alkalinity, residue (total solids, total suspended solids, total dissolved solids), pH, ammonia, nitrates, and phosphorous (total and dissolved). Several stations are sampled for sodium, calcium, and magnesium during the irrigation season. Stations located along streams that receive flows from historic Black Hills mining areas are also analyzed for cyanide, cadmium, lead, copper, zinc, chromium, mercury, nickel, selenium, silver, and arsenic. Stations along streams that receive flows from historic uranium mining or current exploration are analyzed for arsenic, barium, molybdenum, uranium, radium 226, and radium 228. Six sampling stations were added in 2009 to the area surrounding the proposed Hyperion oil refinery location. These sites are being sampled to determine background levels of contaminants and will remain to monitor ambient water quality conditions if the oil refinery is built."

We request that DENR increase it's radionuclide monitoring. Our region has potential of increased in-situ leach uranium mining in both the Dewey-Burdock area and in NE Wyoming near the Bearlodge Mountains. The Cheyenne and Belle Fourche drainages could be effected. There is also a proposed rare earth minerals mine pending in the Bear Lodge Mountains north of Sundance, Wyoming, with ore trucked off site and milling likely to be done off site near a railroad. There are radio nuclide threats associated with the area the rare earth would be mined from and also some rare earths are themselves radioactive. This mine could potentially effect the Belle Fourche as assimilative capacity from Wyoming. Milling is to be done near a railroad and might affect SD waters directly if milling is done near Belle Fourche area railroad line or Cheyenne River as assimilative capacity, if milling is done at Newcastle railroad lines.

There are also old abandoned uranium mines in western SD and this would impact the Cheyenne and the Grand. We believe that Clean Water Alliance and the Rapid City Chapter of the Izaak Walton League contracted to have some SD waters professionally tested for uranium and perhaps other radio-nuclides. DENR should communicate with them for the results of the sampling and perhaps add data to this report. Lilias Jarding would know about the testing, <liliasj@hotmail.com> phone (605-787-2872).

DENR Response:

Please refer to Appendix C pages 187-188 for maps detailing the locations of water quality monitoring sites sampled for uranium and radionuclides. DENR currently samples 11 sites for uranium and radionuclides in western South Dakota. Based on the locations of past and proposed uranium mining activities, DENR believes these 11 monitoring sites adequately capture runoff and represent concentrations in these basins.

Concerns regarding Rare Elements Resources at Bear Lodge Mountain should be directed to the Wyoming Department of Environmental Quality.

DENR public noticed a "Request for Data" on June 7, 2011, requesting water quality data for the 2012 Integrated Report. The data deadline was August 1, 2011. This notice was published by eleven statewide newspapers and mailed to interested parties. A letter was sent to both Nancy Hilding and the Prairie Hills Audobon Society. No water quality data was submitted by either party. A "Request for Data" will be public noticed in June 2013. Lilias Jarding may submit water quality data for the 2014 Integrated Report during that time.

The Spring Creek (Belle Fourche drainage) north east of Sturgis, needs a monitoring site, due to the importance of Bear Butte which it is nearby, shallow oil deposits that may float on surface and leak into stream in natural settings and this natural oil issue is complicated with the beginning & pending oil drilling in area. You need to establish baselines.

You should establish baseline water quality values at all waters near the pumping stations for the two Keystone Pipelines. You should establish baseline water quality values at all waters near to or crossed by the pipelines. This should include monitoring of intermittent waters and wetlands.

Mallory Creek, is a small low flow stream in SD Mallory Creek begins at the base of a mine in SD and flows into some dams and into Wyoming. In Wyoming Mallory Creek drains into Sand Creek which is a class one water (Outstanding State Resource Water). SD should monitor the water quality below the mine and sample the area for fish, to see if small non-game fish exist in stream or dam.

DENR Response:

DENR incorporates risk among other factors when selecting monitoring site locations. DENR has not received any water quality complaints or fish kill reports for Spring Creek. If oil development in the vicinity increases, DENR may reevaluate the need to monitor Spring Creek.

Although sampling surface water bodies near TransCanada facilities would help define the ambient surface water conditions, the most effective way to prevent impacts to surface water from a pipeline release is with real-time leak detection systems and timely and appropriate emergency response practices. Through the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration (PHMSA) TransCanada is required to have 24 hour leak detection including real-time pressure and flow monitoring, volumetric accounting and direct observation. In addition, through the use of remote controlled mainline values TransCanada has the ability to close valves within minutes of detecting a leak. PHMSA also requires TransCanada to prepare an Emergency Response Plan for the pipeline system. In South Dakota, TransCanada must implement their Emergency Response Plan regardless of who causes the pipeline release. TransCanada has demonstrated the effectiveness of their Emergency Response Plan in South Dakota through a successful field exercise near Yankton in September 2010 and by responding in a timely and appropriate manner to four minor pump station releases on the existing Keystone pipeline in South Dakota.

DENR does not believe past and present mining practices near Mallory Gulch Creek (near Tinton) have resulted in elevated risk to the watershed and downstream uses. Mining practices have consisted of crushing and sorting rock, primarily removing pegmatite. The crushed ore was shipped off site for processing. The rock mined is not sulfitic in nature, and there has not been any type of chemical processing. Based on the processing practices and rock geology, the potential for acid mine drainage is highly unlikely.

On page 9 you write:

> "DENR was awarded an EPA R-EMAP research grant (2006-2010) to develop a reference site network for intermittent headwater streams in the northern Glaciated Plains ecoregion of eastern South Dakota. The intermittent stream reference site project was conducted through a collaborative effort between DENR and the principal investigator Dr. Nels H. Troelstrup, Jr. from the Natural Resource Management Department at South Dakota State University. The project provided the state with the tools necessary to identify "reference quality" stream reaches, and the framework for developing bioassessment tools required to make determinations about habitat and biotic integrity of potentially impacted streams."

Thank you for spending time to do more research on headwater intermittent streams. We hope you will also do MORE MONITORING of such streams, especially those waters that are at risk. We are concerned that intermittent streams, may have complex hydrology, where perennial sub-sections alternate with intermittent sub-sections and the ability to support fish, may alternate, with some permanent pools near inflow of springs or other spots. We hope there is greater review of and protection of intermittent waters.

DENR Response:

DENR focuses on potential risk factors as a selection tool for locating water quality monitoring stations across SD. This includes stream segments that exhibit intermittent hydrology. Increasing monitoring efforts for rivers and streams, including intermittent streams, is limited by available resources.

Page 21, if a TMDL is "completed" does that mean the water quality now meets the standard for the stream and the problems are solved? Please clarify what planned, in progress and completed mean. How many streams were "delisted" because the WQS were changed?

DENR Response:

The completion of a TMDL does not imply that the water quality meets the applicable standards. A "completed" TMDL documents the problem and provides potential corrective measures for bringing the water quality into compliance with standards. The support status of the assigned beneficial uses (i.e support tables in the IR), indicates whether the water quality meets standards for a particular waterbody or stream segment.

TMDL development requires "planning" to establish a process for obtaining the necessary information required to derive the TMDL and supporting information. The process may require a watershed assessment project conducted over a year or multiple year period. "In progress" implies that the assessment is ongoing, data is being compiled, or the TMDL document is being written. "Completed" implies that the TMDL document is finalized and approved by EPA.

Three reaches were delisted based on changes to water quality standards. Refer to Appendix B.

LAKES - pages 28-34

Is there a definition of lakes someplace? Do you study ponds, which are smaller than lakes? Please discuss how you protect smaller standing water bodies -- i.e.: ponds & man made dams & stock watering ponds.

DENR Response:

A "lake" is defined in Surface Water Quality Standards Chapter 74:51:01:01(35). DENR's lake assessment program focuses exclusively on waterbodies assigned fishery beneficial use designations in Surface Water Quality Standards Chapter 74:51:02. Examples of fishery designations include cold and warmwater permanent, semi-permanent, and marginal fish life propagation. Lakes assigned to these fish life

beneficial use designations are generally also assigned the beneficial use of limited contact recreation and/or immersion recreation. Larger lakes assigned to these beneficial use classifications receive assessment priority due to recreational value and public significance.

All waterbodies including ponds, small dams and wetlands are assigned the beneficial use of fish and wildlife propagation, recreation and stock watering. All beneficial uses designations contain water quality standard criteria to protect the designated uses. Smaller waterbodies are assessed on a case by case basis, generally resulting from a formal complaint or potential point source discharge. DENR has limited resources to assess all waterbodies in the state and, therefore, prioritizes accordingly.

On pages 36-37 you write:

> "Natural pollutant sources of dissolved and suspended solids are exemplified by erosive soils that occur in western South Dakota badlands and within the Missouri River basin (including considerable exposed marine shale formations) and in extreme southeastern South Dakota (including large areas of highly erodible loess soils). Large storm events that produce significant amounts of precipitation may contribute to suspended sediment problems over large areas of the state, particularly in the west and southeast."

This indicates natural events and conditions creating "reduced" water quality.

DENR Response:
Correct.

Page 41 of the Draft, indicates that *'The most common impairment source for lakes in South Dakota is a combination of natural and agricultural nonpoint source pollution"* If the source of a "pollutant" is natural and non-point, can it officially be classed as a "pollutant"? When you consider "natural nonpoint"sources as pollution, have the "natural" materials been disturbed , altered or aggravated by man or domestic livestock so as to facilitate more erosion of natural materials or to create atypical/abnormal release patterns - greater than historic amounts? For example if turbidity is caused by runoff from a man made dirt or gravel road, do you consider that "natural" non-point? If cows trample a stream bed, increasing erosion, is that "natural" pollution to which you refer?

DENR Response:
A summarization was provided to the multiple comments concerning natural and agricultural nonpoint source pollution as sources of impairment to lakes in SD. Natural sources refer to those events (dry-wet cycles), elements, or pollutants (nutrients, mercury, sediment) that occur in the natural environment and are not attributable to human influence. Impacts from natural conditions are generally considered part of the natural succession of lakes in the prairie environment of SD. Natural conditions and pollutants can impact the beneficial uses of lakes, however, these impacts are accelerated in the presence of human activities such as agriculture. Any reference to human disturbance, alteration, and aggravation by man or domestic livestock to facilitate pollution run-off in an agriculturally dominated watershed is considered agricultural nonpoint source pollution. Therefore, if cows trample a stream bed, increasing erosion, it is not considered natural pollution. Natural sources of impairment and agricultural nonpoint sources are separate categories used to define the source of impairment. It is the combination of both types of sources that cumulatively contribute to impairment of South Dakota Lakes.

However, if the source and dynamics of the substance/property is at natural and at historic levels (such as the Badland storm events described in quote above) - how can the the stream be "impaired" or it be pollution? When "pollution" sources are "natural" and at historic levels, please review and discuss if that the beneficial use for the water has been improperly assigned. In other words, if you have a historically muddy prairie stream that supports fish or other species, who rely on turbidity for their habitat, is that turbidity a "pollutant" and does the turbidity and sediment constitute "impairment"? Do all streams have to be crystal clear and support game fish? Please discuss all fish, even non-game fish, that rely on natural muddy, low flow and/or hot conditions of water bodies for optimum habitat and discuss whether the beneficial uses of water bodies, that are "impaired" by natural sources, have been properly assigned. For example the sturgeon chub, which we think is state listed threatened or endangered, and is a Forest Service sensitive species, needs turbidity for optimum habitat -- how can that necessary turbidity be "pollution"?

If dams remove/reduce natural & historical turbidity, (a parameter needed by some fish and adverse to some fish), is the unnatural clear water created by a dam --- "pollution"? How many fish that SD's streams are managed for exotics, that have driven out or replaced native, non-game fish?

Please discuss all waters that traditionally supported sturgeon chubb or other fishes needing turbidity & how you protect their habitat.

DENR Response:

A summarization was provided for the multiple comments concerning beneficial use assignment of streams and impairment related to natural conditions. "Pollution" is defined in Surface Water Quality Standards 74:51:01:01(50). Applicable to waterbody support determination, causes, and sources, pollution is the alteration of water properties that results in the exceedance of water quality standards. This includes natural and man-made sources. Water quality standards are assigned to protect the designated beneficial uses of a river or stream segment. Because the water quality criteria assigned to protect a particular beneficial use are standardized they are not always representative of a particular system. This is especially true for solids criteria for rivers and streams west of the Missouri River reservoirs. Once a stream is identified as impaired, DENR typically conducts a comprehensive watershed assessment study. The final endpoint of an assessment study is generally TMDL development for the pollutant of concern.

When assessment results demonstrate that natural background levels of a particular pollutant are orders of magnitude higher than the applicable standard, efforts shift to a standards change as the final endpoint. For example, the White River was considered impaired for total suspended solids (i.e. turbidity). Results of a comprehensive study determined that the TSS standard was not applicable to the White River basin based on natural background levels. A standards change was made during the last triennial review, and the TSS standard for the White River was set at a level reflective of the natural background. The substantial increase in the TSS standard was justified and considered protective based on the health and habitat requirements of the resident fish and aquatic macroinvertebrate community. A similar process was followed for the Cheyenne River basin, and standards changes are pending for the current triennial review period.

Questions pertaining to turbidity removal by dams, Sturgeon Chubb impacts, and habitat protection are outside the scope of the Integrated Report. DENR would recommend a separate discussion regarding this topic. Discussions could entail multiple natural resource agencies.

Table 14 says - "Source Category"- "Natural Sources (including drought-related impacts)", "Miles "- "1,286". Please expand on how the natural sources "polluted" 1,286 miles of water..

Page 55 has map with River named "Noreau", suspect typo.

Page 56, shows map of impaired streams, - do we have more miles of impaired streams than in past? Please include statistics to show SD water's compliance with standards as a function of year - since CWA passed.

Thank you,

Nancy Hilding
President
Prairie Hills Audubon Society

Please accept comments on behalf of the Society and
myself as an individual

DENR Response:

For the comment regarding Table 14, please refer to DENR's response for the previous comment. For the comment regarding page 55, the map has "Moreau" correctly typed. It is possible that the "M" looks like an "N" on your printed copy. DENR has added Tables 9 & 10 to compare the number of reaches in each EPA Category in 2012 to 2010. Previous years of South Dakota's Integrated Report are available online at http://denr.sd.gov/documents.aspx for review and analysis.

Comment from Prairie Hills Audubon Society, Nancy Hilding:

Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788
Black Hawk, SD 57718
nhilshat@rapidnet.com,

Nancy Hilding
6300 West Elm
Black Hawk, SD 57718
March 1, 2012

Shannon Minerich
Shannon.Minerich@state.sd.us
Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue – Joe Foss Building
Pierre, South Dakota 57501-3181

This is the second comment letter on the draft Integrated Report for Surface water,

We are concerned with the number of streams/waterbodies throughout the state with "insufficient data" -- indicating that you have not monitored the waters, we fear.
We would like to know how many of the waters with "insufficient data" have a point source on them or a road bed near them. How many are intermittent streams?

We would especially like to express concern about the exemption for placer mines that can be granted under di-minimus exemptions to CWA. As we understand it, this can happen if they are not actively dredging in the stream. We especially object to such exemptions, especially where there is "insufficient data" on the water quality in the stream. If some potential point source is proposed for a water body with "insufficient data", do you at least require the potential polluter to pay for baseline and repeat monitoring at independent lab?

Thanks,

Nancy Hilding

DENR Response:

DENR solicits data from other agencies, organizations, and concerned parties, and uses this data to make waterbody support determinations. Waterbody reaches that are routinely monitored by other agencies/organizations are added to the report even if DENR is not the agency that has collected the data. With funding issues nationwide, many organizations (such as USGS) have reduced monitoring activities. Most reaches with "insufficient data" had prior data submitted by an organization that is no longer monitoring that waterbody. DENR's monitoring budget is also limited, and DENR is not able to monitor all waterbodies throughout the state. Waterbody reaches with "insufficient data" for the 2010 and 2012 cycles will likely be removed from the 2014 report.

There is one waterbody, a tributary to Preachers Run Creek (SD-JA-R-PREACHERS_RUN_TRIB_01_USGS) in Category 3 (insufficient data) that has a point source discharge. This tributary is an intermittent stream and is routinely monitored by USGS. In order for SWQ standards to apply, flow must exceed 1 cfs (surface water discharge permit limits remain in force). At times when flow is less

than 1 cfs, monitoring data collected is not applicable. This often results in a support determination of "insufficient data." The city of Ipswich waste water treatment facility discharges treated water to this tributary. The city of Ipswich is required to monitor their discharge and provide the information in quarterly reports to DENR. Although the tributary is in Category 3 based on IR listing methodology, the discharge is still monitored by the city of Ipswich.

Regarding placer mining, surface water discharge and mining permits are required based on the size of the operation and the tools or equipment used. Additionally, DENR may require permits if the size of disturbed area is considered excessive or if the department receives complaints and determines pollution is occurring.
It is a common practice for DENR to require potential point source dischargers to collect background water quality data before the discharge occurs.

Comment from Richard Draeger:

We are risking South Dakota water and future economic development. We must regulate uranium development.

DENR Response:
Uranium mining in South Dakota is currently regulated by the federal Nuclear Regulation Commission, the EPA, and DENR. DENR's authority is outlined in the laws and regulations set forth by the state legislative process.

Comment from Ellsworth Air Force Base, Kevin B. Goyer:

EAFB was sent a notice from SD DENR to consider commenting upon the draft 2012 South Dakota Integrated Report for Surface Water Quality Assessment.

I reviewed the report, particularly to see if the waterbody to which EAFB discharges (Box Elder Creek from the Cheyenne River to Section 22, Township 2 North, Range 8 East) has changed status. A reduction of water quality could lead to higher effluent standards and more monitoring for discharge permittees.

The report concluded that this waterbody meets water quality standards for all designated beneficial uses (Fish/Wildlife Propagation, Irrigation Waters, Limited Contact Recreation, Warmwater Marginal Fish Life). Monitoring of water quality will continue; however, it is not identified as needing further study at this time.

We have no comments but sincerely appreciate having been asked to comment. Please let me know if I can be of further help to you.

V/R
Kevin

Kevin B. Goyer, GS-12, BS EnvE
Water Quality Prog. Engr.

2125 Scott Drive, Ste 2128
Ellsworth AFB, SD 57706-4711
(605) 385-2662 (DSN 675)

DENR Response:
Thank you for your comments. DENR appreciates your participation.

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182
www.state.sd.us/denr

June 7, 2011

RE: Request for Water Quality Data

Dear Interested Party:

It is time for the department to begin preparation of the 2012 Integrated Report. The Integrated Report combines the 305(b) report and the 303(d) list into one report, which provides an assessment of the quality of South Dakota's surface water resources and identifies the impaired waters that require Total Maximum Daily Loads (TMDLs). Total Maximum Daily Loads calculate the amount of pollution a water body can receive and still meet water quality standards along with supporting assigned beneficial uses. Once TMDLs are determined, local, state, and federal activities can be directed toward improving the quality of the water body.

To develop an accurate, defensible, and comprehensive list, the department is soliciting water quality data or other information you may have to help us determine the quality of South Dakota's waters. Chemical, physical, or biological data will be considered. Data that represent the condition of a specific water body will be used to update the 303(d) list. Only data less than eight years old and in electronic format will be considered. Please provide any quality assurance/quality control measures that were used in collecting the data you submit. Specific water quality reports that explain and interpret the data are also requested. In addition, beach closure information is also requested including date, duration, and bacterial water quality results.

We need to have this information for the 2012 Integrated Report by August 1, 2011. South Dakota's most recent Integrated Report is available at the department's website: http://denr.sd.gov/documents/10irfinal.pdf. If you have questions or water quality data for our list, contact either Shannon Minerich or Paul Lorenzen at (605) 773-3351, or email an electronic version of the data to Shannon.Minerich@state.sd.us or Paul.Lorenzen@state.sd.us. Thank you for your help.

Sincerely,

Steven M. Pirner
Secretary

Notice of Request for Water Quality Data for 2012 Integrated Report

The South Dakota Department of Environment and Natural Resources is beginning the preparation of the 2012 Integrated Report. The Integrated Report provides an assessment of the quality of South Dakota's surface water resources and identifies the impaired waters that require Total Maximum Daily Loads (TMDLs). Total Maximum Daily Loads calculate the amount of pollution a waterbody can receive and still meet water quality standards along with supporting assigned beneficial uses. Once TMDLs are determined, local, state, and federal activities can be directed toward improving the quality of the waterbody.

To develop a comprehensive list, the department is soliciting water quality data to help determine the quality of South Dakota's waters. Chemical, physical, and biological data will be considered. Beach closure information, including date, duration, and water quality results is also requested.

Persons or organizations having water quality data should contact Shannon Minerich at 1-800-438-3367 or by email Shannon.Minerich@state.sd.us by August 1, 2011.

Department of Environment and Natural Resources
523 East Capitol Avenue
Pierre, South Dakota 57501-3182

Steven M. Pirner
Secretary

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181

www.denr.sd.gov

FOR IMMEDIATE RELEASE: Monday, January 23, 2012
FOR MORE INFORMATION: Shannon Minerich or Paul Lorenzen, 1-800-438-3367

DENR Seeks Comments on Waterbody Report

PIERRE – The state Department of Environment and Natural Resources (DENR) is seeking public comments on the draft Integrated Report. Required under the federal Clean Water Act, this report is used by the state to identify impaired waterbodies in South Dakota. Public comments from the general public and other interested parties and organizations will be accepted through March 1, 2012. Comments can be emailed to Shannon Minerich at *Shannon.Minerich@state.sd.us* or by writing:

Department of Environment and Natural Resources
Surface Water Quality Program
523 East Capitol Avenue – Joe Foss Building
Pierre, South Dakota 57501-3181

A copy of the draft 2012 Integrated Report is available by contacting DENR at the above address, by phone at 1-800-438-3367, or by visiting DENR's website at: http://denr.sd.gov/documents/12irdraft.pdf.

The draft 2012 Integrated Report contains an assessment of the surface water quality of South Dakota's waters, a description of South Dakota's water quality monitoring programs, pollutants causing impairments of the water bodies, and identification of waters targeted for total maximum daily load development. A total maximum daily load is a determination of the amount of pollution a waterbody can receive and still maintain water quality standards.

"Because this list drives state water quality programs, it is important that people in South Dakota see the draft report and provide us comments before it is finalized and sent to EPA for approval," said DENR Secretary Steve Pirner.

The draft 2012 report lists 154 waterbodies or waterbody segments needing a total maximum daily load. Of those listed, 91 (or 59%) are stream and river segments and 63 (or 41%) are lakes that periodically exceed water quality standards.

-more-

Pollutant reductions to meet total maximum daily loads can be achieved through many different ways, depending on the type and source of pollutants. For example, if the pollutant comes from runoff, DENR can help local sponsors of water quality improvement projects seek cost share funding to help landowners install best management practices that will reduce the pollutant in runoff.

Since the last biennial report in 2010, 69 total maximum daily loads have been completed or determined to be unnecessary, 79 are in progress, and 84 are planned.

- 30 -