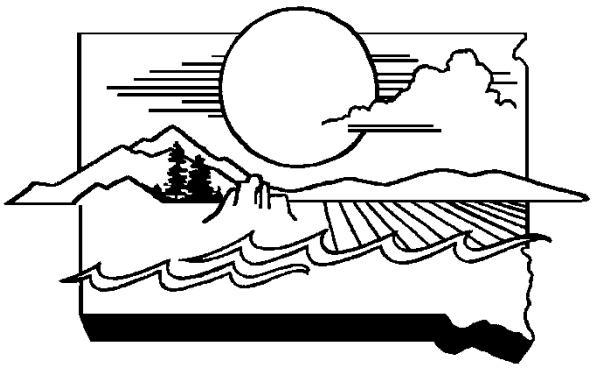
THE 2014 SOUTH DAKOTA INTEGRATED REPORT FOR SURFACE WATER QUALITY ASSESSMENT



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

JOE FOSS BUILDING
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March 27, 2014

Martin Hestmark, Assistant Regional Administrator
U.S. Environmental Protection Agency, Region 8
Office of Ecosystems Protection & Remediation
1595 Wynkoop Street, Mail Code 8EPR
Denver, CO. 80202-1129

Re: Final 2014 South Dakota Integrated Report

Dear Mr. Hestmark:

I am pleased to submit to you, prior to the April 1, 2014, deadline, the 2014 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 2014 report is one of the most comprehensive reviews of water quality data completed in South Dakota to date.

A hardcopy of the report and supporting electronic files have been submitted to Elizabeth Rogers with EPA Region 8. An electronic copy of the report is also available via our homepage at: http://denr.sd.gov/documents/14irfinal.pdf.

We look forward to your agency's full approval of our 2014 Integrated Report. We also want to thank you and your staff for assistance during the development process.

Sincerely,

Steven M. Pirner, PE
Secretary

cc: Elizabeth Rogers

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
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http://www.epa.gov/region08

Ref: 8EPR-EP

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

Re: 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) 2014 Water Quality Integrated Report received March 31, 2014. 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 2014 Section 303(d) list meets the requirements of Section 303(d) of the Clean Water Act (CWA) and the EPA's implementing regulations found at 40 C.F.R. Part 130 and approves South Dakota's 2014 Section 303(d) list.

The EPA's approval of South Dakota's 2014 Section 303(d) list extends to waterbodies on the list with the exception of those waters that are within Indian country, as defined at 18 U.S.C. § 1151, which includes lands within the exterior boundaries of the following Indian reservations located within the State of South Dakota: Cheyenne River Indian Reservation, Crow Creek Indian Reservation, Flandreau Indian Reservation, Lower Brule Indian Reservation, Pine Ridge Indian Reservation, Rosebud Indian Reservation, Standing Rock Indian Reservation, Yankton Indian Reservation; any land held in trust by the United States for an Indian tribe; and any other areas which are "Indian country" within the meaning of 18 U.S.C. § 1151. EPA is taking no action with respect to the Indian country area at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities for Indian country lands.

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 2014 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.

Review of South Dakota's 2014 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 27, 2014
Date of Receipt by EPA: March 31, 2014

I. Introduction

South Dakota Department of Environment & Natural Resources (DENR) submitted their final 2014 Integrated Report (IR) to the Environmental Protection Agency (EPA) on March 31, 2014. 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 2014 list. The purpose of this review document is to describe the rationale for EPA's approval. The EPA's approval of South Dakota's 2014 Section 303(d) list extends to waterbodies on the list with the exception of those waters that are within Indian country, as defined at 18 U.S.C. § 1151, which includes lands within the exterior boundaries of the following Indian reservations located within the State of South Dakota: Cheyenne River Indian Reservation, Crow Creek Indian Reservation, Flandreau Indian Reservation, Lower Brule Indian Reservation, Pine Ridge Indian Reservation, Rosebud Indian Reservation, Standing Rock Indian Reservation, Yankton Indian Reservation; any land held in trust by the United States for an Indian tribe; and any other areas which are "Indian country" within the meaning of 18 U.S.C. § 1151. EPA is taking no action with respect to the Indian country area at this time. EPA, or eligible Indian Tribes, as appropriate, will retain responsibilities for Indian country lands.

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 2014 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 2014 list is considered an update of the State's 2012 list, and as such, the Section 303(d) list EPA is approving today is comprised of 168 assessment units (221

waterbody/pollutant combinations), compared with 155 assessment units included on the 2012 list. States may add and take waters off their Section 303(d) lists based on several factors. For the 2014 cycle, South Dakota removed 31 waterbody/pollutant combinations from its year 2012 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

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

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 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 2014 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 20 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 27, 2014 from Steven M. Pirner, Secretary, Department of Environment & Natural Resources, in a document entitled "*Final 2014 South Dakota Integrated Report (2014 Integrated 305(b) and 303(d) Report).*"

The year 2014 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 195-204: 303(d) List of South Dakota's Impaired Waters Requiring TMDL studies).
- **Prioritization of waterbodies for TMDL development** (See Appendix D, Pages 195-204: 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 195-204: 303(d) List of South Dakota's Impaired Waters Requiring TMDL studies).

EPA's approval action of South Dakota's year 2014 Section 303(d) list extends only to the items listed immediately above.

The 2014 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 2014 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 2014 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 2014 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 2014 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 2014 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 2014 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 2014 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 2012 303(d) list is provided on Page 18 and in Appendix B, Pages 182-184 of the Integrated Report. The states removal decisions and stated justifications are summarized below:

Number of Waterbody-Pollutant Combinations Removed from List	
Reason	**2014**
TMDL completed and approved by EPA	18
Original basis for listing was incorrect	5
New data or information indicate applicable WQS is being met	8
Total	31

In reviewing the State's 2014 Section 303(d) waterbody list, EPA carefully considered South Dakota's decision to remove certain waterbody-pollutant combinations from the State's 2012 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 15 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 2014 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 2014 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 2014 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.

September 3, 2013, US EPA Memorandum, Information Concerning 2014 Clean Water Act 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions

March 27, 2014, South Dakota Department of Environment & Natural Resources response regarding EPA's comments on South Dakota's 2014 draft Integrated Report.

SOUTH DAKOTA WATER QUALITY
WATER YEARS 2008-2013 (streams) and
WATER YEARS 2004-2013 (lakes)

The 2014 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 provide information and provide guidance. 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, outside organizations, and DENR project sponsors. Those groups include the United States Geological Survey (USGS), United States Army Corp of Engineers (USACE), United States Bureau of Reclamation (BOR), Minnesota Pollution Control Agency (MPCA), Nebraska Department of Environmental Quality (NE DEQ), Wharf Resources, the cities of Watertown and Sioux Falls, East Dakota Water Development District (EDWDD), Pennington County, Belle Fourche River Watershed Partnership, Day County Conservation District, Moody County Conservation District, Custer County, Black Hills Resource Conservation & Development, and South Dakota State University. DENR greatly appreciates data submissions from outside organizations and project sponsors. These submissions provide DENR with increased monitoring data which will improve the confidence of support determinations. Outside organizations may also monitor waterbodies that are not currently monitored by DENR, therefore increasing the extent of waterbodies included in the Integrated Report.

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 Codified 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 9,726 miles of perennial rivers and streams (Table 1) and about 86,660 miles of intermittent streams. About 6,160 stream miles have been assessed in the past five years (October 2008 to September 2013). During this 5-year interval, 30.6% of assessed stream miles were found to support the assigned beneficial use; 69.4% did not support one or more beneficial uses. 53.4% percent of stream miles designated for immersion recreation supported that beneficial use. DENR has listed a total of 94 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 143 of the 572 classified lakes. The assessed lakes account for 75.1% of the total classified lake acreage. An estimated 44.2% of the assessed lake acreage was considered to support assigned beneficial uses. DENR has listed a total of 72 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	98,009*
Number of perennial river miles (subset)	9,726*
Number of intermittent stream miles (subset)	87,780*
Number of border river miles of shared river/streams (subset)	337*
Miles of ditches and canals (man-made waterways)	503*
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	1,760,149**
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)
** National Wetlands Inventory

South Dakota has an estimated 1.76 million acres of small depressional wetlands with shallow water habitat according to the National Wetland Inventory. However, this estimate is relatively outdated; the actual wetland acreage was not quantified for this reporting cycle. National estimates suggest wetland loss is increasing which is likely the trend for South Dakota. 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.

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 for point sources of pollution to ensure water quality standards are maintained.

Nonpoint Source Pollution Control:
Nonpoint Source (NPS) 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. The Clean Water Act section 319 program is the focal point for a majority of the existing NPS control programs. For more than 25 years, the 319 program has been developing and implementing watershed restoration projects throughout the state.

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 address 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 94 stream segments and 72 lakes require TMDLs to address impairments. Of the total number of required TMDLs (all causes combinations), 64% are for streams and 36% 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 and that data is available on their website. DENR maintains an internal water quality database (NR92) and submits water quality data through EPA's Water Quality Exchange to EPA's data storage and retrieval (STORET) system.

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. Site specific standards are available in ARSD Chapters 74:51:01:48.01, 74:51:01:48.02, 74:51:01:53.01, and 74:51:01:56.

Fixed Station Ambient Monitoring

The DENR water quality monitoring network is currently made up of 146 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 water quality 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 near Elk Point. These sites were sampled to determine background levels of contaminants prior to construction. In 2013, after Hyperion allowed land options to expire and environmental permit construction deadlines were not met, DENR decided to discontinue monitoring at five of the six sampling stations and reduce parameters on the remaining site. DENR will reassess the need to monitor the area if Hyperion resumes the pursuit of building the oil refinery.

Ambient station locations, descriptions, and schedules are included in Appendix C. More detailed descriptions of individual stream sites are available online at http://denr.sd.gov/des/sw/wqmonitoring.aspx or from DENR upon request.

Intensive Water Quality Monitoring (Point Sources or Special Studies)

Some of South Dakota's wastewater treatment facilities are required to meet limits beyond the federal technology-based effluent limits. For many of these permits, DENR conducts an intensive water quality survey of the waterbody receiving the discharge. These surveys provide additional information to assist in the development of water quality-based effluent limits for the Surface Water Discharge permits. Point source special studies have recently been conducted on Whitewood Creek, Box Elder Creek, and South Fork Whetstone River, and information is being used in the development of Surface Water Discharge permits for Lead - Deadwood Sanitary District, Ellsworth Development Authority, and Valley Queen Cheese and the city of Milbank.

Intensive water quality monitoring is sometimes initiated to assess problem areas, to investigate and identify quality control issues, to obtain data for use in site-specific criteria modification studies, or to provide updated information for a waterbody. In 2011, DENR conducted a special study on Annie Creek to investigate cyanide levels. The investigation concluded that cyanide levels did not exceed water quality standards and identified quality control issues with the laboratory and the analytical method.

Use Attainability Analysis

DENR conducts a Use Attainability Analysis (UAA) on waterbodies only assigned 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 2013, 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 use attainability assessment, watershed assessment study or special project. DENR's Watershed Protection Program incorporates aquatic plant/algae surveys and chlorophyll-*a* testing into lake studies. Stream studies incorporate bioassessment surveys using fish, aquatic invertebrates and periphyton as primary biological indicators of water quality.

DENR and research partners from South Dakota State University recently completed initial development of a stream reference site network and associated bioassessment methods for perennial wadeable streams in the Northern Glaciated Plains (NGP) ecoregion of eastern South Dakota. The project focused on reference site validation, Index of Biological Integrity (IBI) development, and generation of a biomonitoring toolkit to increase the states biological monitoring and assessment capacity. Final deliverables of the project included identification of validated reference sites, core metrics and an IBI process-quantification tool. The project also yielded biological, habitat and water quality datasets, Kriging (IBI interpolation tool) maps, habitat entry and analysis templates, two M.S. theses and several peer review journal publications. A RIVPACS model could not be calibrated due to the limited number of reference sites available for the region. Results of this effort will be used for a variety of water resource management applications including implementing narrative standards. Future work will be focused on expanding the reference site network and IBI development to smaller regional levels within the NGP.

Efforts are currently underway through DENR's partnership with SDSU to expand reference site and bioassessment development to the Northwestern Great Plains ecoregion which encompasses most of the landscape west of the Missouri River outside the Black Hills. Reference site and IBI development will be stratified by level IV ecoregions. Project design, site selection and landowner permissions were completed in 2013. The field season portion of the project is scheduled for 2014 and 2015.

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.

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 2012-2013 survey included all lakes designated coldwater and warmwater fish life beneficial uses (572). Three waterbodies deemed publicly important were also sampled. Approximately, 55 classified lakes were randomly selected and sampled during the 2012-2013 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 2014 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.

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

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 standard[,2]	[5]Equation-based standard[,2]	[5]Equation-based standard[,2]	[5]Equation-based standard[,2]	[5]Equation-based standard[,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 & 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		

[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 100mg/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 ug/L and 12.82 ug/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
$(((0.0577/(1+10^{7.688-pH})) + (2.487/(1+10^{pH-7.688}))) * \text{MIN}(2.85, 1.45 * 10^{0.028 * (25-T)}))$
Equation 4: For waters where early life stages are absent.
$(((0.0577/(1 + 10^{7.688-pH})) + (2.487/(1 + 10^{pH-7.688}))) * 1.45 * 10^{0.028 * (25-\text{MAX}(T,7))})$
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 the waterbody to support its designated beneficial uses.

Section 303(d) of the federal Clean Water Act requires states to develop and submit a biennial list of impaired waters that will be targeted for TMDL development. This is referred to as the 303(d) list. Pollutant causes, TMDL priority, and a schedule for TMDL development must be included. It is recommended that states develop TMDLs at a pace necessary to complete TMDLs within a 13-year period after being listed. 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 2014 303(d) list.

Impaired Waters

Waters that are considered impaired require a TMDL. This includes waterbodies that are identified as "NON" (nonsupporting) or "TH" (threatened) under the "Support" column in the basin tables. These waterbodies are placed in EPA Category 5 which means the waterbody is impaired and requires a TMDL. This is the basis for the 303(d) list. If a waterbody is identified as "NON" or "TH" but has an approved TMDL for the pollutant cause, the waterbody is placed in EPA Category 4a.

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.

Waters Reported by Government Agencies, Members of the General Public, or Academic Institutions
DENR did not receive recommendations to list specific water resources on the 2014 303(d) list from outside government agencies, members of the general public, environmental organizations, or academic institutions.

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.

TMDL assessments are developed based upon the prioritization criteria listed above and 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

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 in Tables 31 – 44. These tables include waterbody names, pollutants of concern, basis for listing, and other information. A total of 166 different waterbodies require TMDLs (Table 6). Each waterbody may contain several different pollutants and thereby may constitute several TMDLs which results in 221 waterbody/cause combinations. 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).

Ideally, if a 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. It is also common to find impairments for additional pollutants during or after the completion of the TMDL assessment work and/or report. 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. An enormous work effort is required to complete the number of TMDLs in the recommended time frame.

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 for DENR to develop TMDLs for each impaired waterbody within two years. The time frame to develop TMDLs on each biennial list is 13 years based on EPA's recommendation.

Status of 2012 Integrated Report TMDLs

South Dakota's 2012 303(d) list contained 155 waterbodies or waterbody reaches and a total of 207 waterbody/cause combinations that required TMDL development. Thirty-one waterbody/cause combinations have had TMDLs completed or determined to be unnecessary by DENR since April 1, 2012.

Table 5 and Figure 1 show the status of waters that required TMDLs in the 2012 Integrated Report. The following definitions further describe status categories:

- TMDL Complete – a watershed assessment has been completed, and a TMDL has been completed and approved by EPA;
- TMDL 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;
- In Discussions with EPA –TMDL development is being discussed with 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.;
- Future TMDL – A watershed assessment has not been initiated but is planned for future development.

Table 5: Status of TMDLs from 2012 Integrated Report

TMDL Status	Number and Percentage of TMDLs
TMDL Complete	18 (9%)
TMDL In Progress	82 (40%)
In Discussions with EPA	29 (14%)
Delisted based on new information	13 (6%)
Future TMDL	65 (31%)
Total reach/cause combinations:	207 (100%)

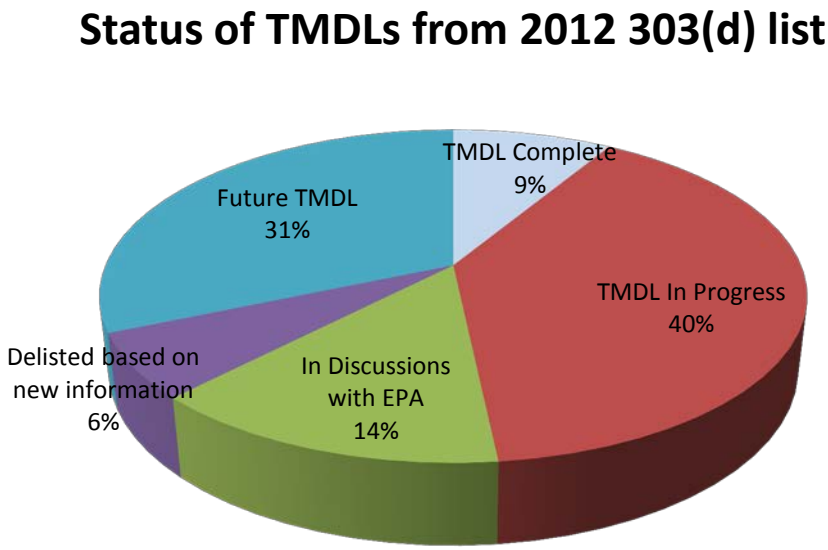


Figure 1: Status of TMDLs from the 2012 Integrated Report1

Delisting Reasons

Delisting of Waterbodies

Waters may be delisted using the following EPA delisting reasons:

- 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
  - According to new assessment method; or
  - Original basis for listing was incorrect; or
  - Threatened water no longer threatened;
    - 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 provides a list of waterbodies, causes, and delisting reasons used for the 2014 reporting cycle.

TMDLs Required by the 2014 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 2012 Integrated Report. The total number of required TMDLs has increased from 2012 to 2014. Many of these impaired watersheds have TMDL development and/or implementation projects already in progress.

Table 6: 2014 Summary of TMDLs by Basin

Basin	Number of Waterbodies Requiring TMDLs	Pollutants of Concern
Bad River Basin	4	chlorophyll- *a*, dissolved oxygen, specific conductance
Belle Fourche River Basin	15	*E. coli,* fecal coliform, mercury in fish tissue, dissolved oxygen, pH (high), temperature, total suspended solids
Big Sioux River Basin	30	chlorophyll- *a*, *E. coli,* fecal coliform, mercury in fish tissue, pH (high), temperature, total suspended solids, dissolved oxygen
Cheyenne River Basin	29	*E. coli,* fecal coliform, dissolved oxygen, pH (high), salinity (SAR), specific conductance, temperature, total dissolved solids, total suspended solids
Grand River Basin	11	chlorophyll- *a*, *E. coli,* fecal coliform, mercury in fish tissue, salinity (SAR) , specific conductance, temperature, total suspended solids
James River Basin	38	cause unknown (narrative standards), chlorophyll- *a*, *E. coli,* fecal coliform, mercury in fish tissue, dissolved oxygen, pH (high), temperature, total dissolved solids, total suspended solids
Little Missouri River Basin	1	total suspended solids
Minnesota River Basin	9	*E. coli,* dissolved oxygen, pH (high), temperature
Missouri River Basin	10	chlorophyll- *a*, mercury in fish tissue, dissolved oxygen, pH (high), temperature
Moreau River Basin	5	*E. coli,* fecal coliform, mercury in fish tissue, pH (high), salinity (SAR) , specific conductance, total dissolved solids, total suspended solids
Niobrara River Basin	1	chlorophyll- *a*
Red River Basin	0	
Vermillion River Basin	7	chlorophyll-*a*, *E. coli,* fecal coliform, pH (high), temperature
White River Basin	6	*E. coli,* fecal coliform, pH (high) , salinity (SAR)
TOTALS	**166**	

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, outside organizations, and DENR project sponsors. Those groups include the United States Geological Survey, United States Army Corp of Engineers (USACE), United States Bureau of Reclamation (BOR), Minnesota Pollution Control Agency, Nebraska Department of Environmental Quality, Wharf Resources, the cities of Watertown and Sioux Falls, East Dakota Water Development District, Pennington County, Belle Fourche River Watershed Partnership, Day County Conservation District, Moody County Conservation District, Custer County, Black Hills Resource Conservation & Development, and South Dakota State University.

DENR maintains a Quality Management System 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 Management System, Quality Assurance Project Plans, and Standard Operating Procedures. It also includes the preparation of periodic reports to DENR management and EPA; the review of contracts, grants, agreements, etc., for consistency with quality assurance/quality control (QA/QC) requirements; and the administration of QA/QC systems and performance audits. This requires the establishment of schedules for the collection of duplicate and blank samples, laboratory split samples, review 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 Quality Program and Feedlot Permit Program,* Revision VI, August 2013, and *Surface Water Quality Program and Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling,* Revision II, May 2013. The Watershed Protection Program operates under the *Water Resources Assistance Program Quality Assurance Project Plan for the Assessment Team and Implementation Team,* Revision IV, August 2013, and *Standard Operating Procedures for Field Samplers,* Volume I & II, February 2005. DENR requires that all outside organizations that submit outside data or qualitative evaluations for this Integrated Report operate under a quality management system and be willing to provide quality documentation upon request.

Rivers and streams were assessed by dividing the waterbodies 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. For lakes, the entire waterbody is assessed as a whole unit; lake acreage is determined using the National Hydrography Database. Monitoring data obtained during the current reporting period were analyzed by using DENR's NR92 Database system. The data for each monitored waterbody were compared to numeric water quality standards applicable to the beneficial uses assigned to the segment (Tables 2 and 3) and nutrient-related narrative standards. Monitored stream course mileages and lake acreages were measured using the Hydrography Event Management Tool.

Assessment Methodology for Numeric Water Quality Standards

Specific listing criteria were developed for the Integrated Report to define how data would be evaluated to determine the support status of each waterbody. The following criteria were used:

Table 7: 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 chronic 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 impaired	STREAMS: >10% exceedance for daily maximum criteria (or 3 or more exceedances between 10 and 19 samples) or >10% exceedance for chronic criteria (or 2 or more exceedances between 2 and 19 samples) 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 and LAKES: At least one fish flesh sampling event. More than one exceedance of toxic criteria within the past 3 years (minimum 2 samples).
FOR TOXIC PARAMETERS Required percentage of samples exceeding water quality standards in order to consider segment impaired	STREAMS AND LAKES: More than one exceedance of toxic criteria within the past 3 years for both the acute and chronic standard. Fish flesh samples 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, 2008, to September 30, 2013 LAKES: All available data from the most recent 10-year period, January 2004 through September 2013. 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. 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 waterbody 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, 2008, to September 30, 2013, (5 years) for streams, and January 1, 2004, to September 30, 2013, (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 timeframe 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 12 through 30. More detailed information on the lakes and streams in each river basin is presented in Tables 31 through 44.

In addition to the stream and lake listing methodologies, waterbodies were also evaluated based on reported beach closures, fish kills, fish consumption advisories, applicable public complaints, and best professional judgment.

Stream Assessment Methodology for Nutrient-Related Narrative Standards

EPA considers nutrient pollution of the nation's waters a top priority. The agency is calling upon states to increase their efforts to address nutrient pollution. Item #3 in EPA's 2014 IR Memo to States, describes considerations for "Identifying nutrient-impacted waters for the Section 303(d) list for States without formal numeric nutrient water quality criteria." This section identifies potential approaches for developing nutrient-related criteria to address applicable narrative standards to make beneficial use support determinations and impairment decisions. If states fail to evaluate existing and readily available data and information relevant to applicable narrative criteria and designated uses, EPA "will take appropriate actions consistent with the Clean Water Act". This was demonstrated in the 2010 reporting cycle when EPA added 12 lakes to South Dakota's 303(d) list.

South Dakota has a number of narrative water quality standards (74:51:01:05, 74:51:01:06, 74:51:01:08, 74:51:01:09, and 74:51:01:012) designed to protect surface waters from nutrient-related impacts. In response to EPA's 2014 IR Memo, DENR developed the following assessment methodology to review existing and readily available data to determine waterbody support of applicable nutrient-related narrative standards as part of the 2014 IR stream listing methodology (Table 8).

DENR used bioassessment tools recently developed during the Northern Glaciated Plains (NGP) Reference Site and Biological Assessment Project as the basis for the 2014 stream assessment methodology. Bioassessment tools are developed on a regional or site-specific basis and are only applicable to the area where they were developed. As a result, the assessment methodology applies only to perennial, wadeable stream assessment units located in level III ecoregion 46, with the exception of those in level IV ecoregion 46c (Figure 2). In addition, this does not include the mainstems of the major river basins (exception Big Sioux River upstream of Watertown, South Dakota) within level III ecoregion 46. Limitations associated with evaluating all assessment units statewide are based on the availability of regional and site-specific bioassessment tools.

Building bioassessment capacity at the statewide level is a long-term goal of DENR and its research partners from South Dakota State University. Efforts are currently underway to develop bioassessment tools for wadeable streams in western South Dakota, excluding the Black Hills. As regional bioassessment tools become available, the assessment methodology will evolve to incorporate additional assessment units in subsequent reporting cycles.

Table 8: Assessment Methodology for Nutrient-Related Narrative Standards Applicable to Wadeable Streams in Ecoregion 46

Are there at least 20 total phosphorus-nitrogen sample results in the assessment unit?	No	End assessment
Yes		
Is the assessment unit located in Level III Ecoregion 46?	No	End Assessment
Yes		
Is the assessment unit located in Level IV Ecoregion 46c?	Yes	End Assessment
No		
Is the assessment unit considered wadeable?	No	End Assessment
Yes		
Is the average total phosphorous concentration above 0.18 mg/L or is the average total nitrogen concentration above 2.5 mg/L.	No	End Assessment
Yes		
Is an Invertebrate IBI and Fish IBI score calculated for the assessment unit?	No	Assign assessment unit to category 2N
Yes		
Are both IBI scores > 50 If one IBI score is < 50 and one IBI score is > 50, and a Habitat Condition score is not available see special note: If two IBI scores (>50) and one Habitat Condition score (>60) is calculated: Are 2-of-3 scores meeting the impairment thresholds? Invert and Fish IBI >50 Habitat Condition Score >60	No	List as Impaired/Threatened Special Note: If one IBI score is < 50 and the other IBI score is > 50, then assign to category 2N. * Category 2N Implies the Assessment unit requires Invertebrate IBI, Fish IBI and Habitat Condition scores to make a final support or impairment determination.
Yes	No	List as Impaired/Threatened
Assessment unit is not impaired.		

Figure 2: Location of Ecoregion 46 excluding 46c within South Dakota.

Nitrogen and phosphorus are often the main nutrients of concern with regards to increased primary production and associated effects on aquatic environments. Concentrations of nitrogen and phosphorus vary significantly in streams across South Dakota and impacts are not well understood. Results from the NGP reference site and bioassessment development project were examined as part of the assessment methodology development process. A significant ($p<0.001$) inverse linear relationship was observed between Invertebrate Index of Biotic Integrity (IBI) and total phosphorus concentration. Total phosphorus explained nearly 30% ($R^2 = 0.27$) of the variation in IBI score. A similar pattern was also observed with fish IBI and total phosphorus concentrations. Both invertebrate and fish IBI were significantly correlated to total phosphorus concentration (rho = -0.6) and dissolved oxygen (rho = -0.6), a parameter often associated with the effects of phosphorus. There was not a clear linear relationship or correlation between IBI and total nitrogen. Because nitrogen is a volatile nutrient and certain forms (nitrate-nitrite, ammonia) can directly impact biota, a total nitrogen threshold was included in the assessment methodology.

Total nitrogen and total phosphorus thresholds were established to provide an initial screening tool to identify assessment units potentially impacted by nutrients. Total nitrogen and total phosphorus thresholds could not be derived from data obtained from the NGP reference site and bioassessment project due to significant variability associated with relational data. The upper 75th percentile of the reference site (n=7) total phosphorus data was 0.269 mg/L. While this is an acceptable method for deriving an impairment threshold, it was not considered at this time due to the small number of reference sites. DENR plans to continue biomonitoring and assessment efforts in

ecoregion 46 in the future to build the reference site network and increase relational data.

DENR relied on results from EPA's National Wadeable Streams Assessment to establish total nitrogen and total phosphorus thresholds. The nitrogen (2.50 mg/L) and phosphorus (0.18 mg/L) thresholds were based on the 75th percentile of the reference site data from the Temperate Plains nutrient region which corresponds to ecoregion 46 in eastern South Dakota (Herlihy and Sifneos 2008). These nutrient thresholds are considered course values due to the larger regional component and will be subject to change in subsequent reporting cycles.

Macroinvertebrate and fish community health provide the primary basis for determining whether a stream assessment unit is attaining applicable narrative standards and supporting designated uses. Quantifying the health of both indicator groups provides a more holistic representation of overall biotic health. Both communities integrate the effects of multiple stressors overtime at different trophic levels. An IBI was developed for wadeable streams in ecoregion 46 following processes described in Whittier et al. 2007, to provide the means to quantify the health of both communities.

An IBI integrates sensitive measures or metrics of community structure and function that are capable of discriminating between good (reference) and poor biological health. Core metrics scores are summed and scaled to provide a single IBI score from 0 to 100 with 100 being reference condition. Initial impairment thresholds for the 2014 reporting cycle were based on quartile deviations from reference. IBI scores of 100 to 75 were considered good biological integrity and 75 to 50 were considered fair biological integrity. Scores under 50 were considered to be poor (50 to 25) and very poor (25 to 0) biotic integrity. Therefore, an IBI score of less than 50 for both macroinvertebrate and fish was considered impaired. This threshold determination is subject to change based on future analysis with available IBI data.

A quantified measure of habitat condition was also used as a line of evidence especially if the fish and macroinvertebrate IBI scores display conflicting support status. Habitat condition can provide an indicator of a stream's physical potential to support a healthy biological community. It can also identify factors that may be impacting narrative standards and designated uses. Habitat condition was quantified using EPA's Rapid Habitat Assessment (RHA) protocol (Barbour et al. 1999). The RHA provides a scoring convention for various habitat parameters. Scores were scaled from 0-100 with 100 signifying best condition. DENR considered a habitat condition score of less than 60 to be poor condition.

A total of 20 total phosphorus and/or total nitrogen samples collected within the most recent 5-year period (2008-2013) were required to generate an average to begin the screening portion of the support assessment. If a macroinvertebrate IBI, fish IBI, and habitat condition score were not available within the most recent 10-year period, the assessment unit was placed in user-defined subcategory 2N to indicate further evaluation is needed. An assessment unit was also placed in subcategory 2N if macroinvertebrate and fish IBI scores conflicted and a habitat condition score was not available. DENR will consider assessment units in subcategory 2N a top priority for collection of adequate IBI and habitat information within a reasonable timeframe.

Twenty assessment units met methodology conditions to be assessed for nutrient-related narrative standards. Eleven assessment units had average total nitrogen and/or total phosphorus concentrations above the respective thresholds. Eight assessment units were placed in user defined category 2N due to requiring either IBI and/or habitat

information. Two assessment units were considered fully supporting and one assessment unit, SD-JA-R-FIRESTEEL_01, was considered impaired.

When an assessment unit is considered impaired for not meeting the applicable narrative standard it will be placed on the 303(d) list with a cause of "unknown" until a stressor analysis or TMDL analysis determines the pollutant or pollutants impacting biotic integrity of the community of concern. The biological impairment is associated with the aquatic life designated use.

Lakes Assessment Methodology for Numeric Standards

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 (2004-2013) 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 pertinent 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 were historically targeted and sampled on a four-year rotation twice during the growing season (May through September). In 2008, DENR adopted a random 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 (i.e. 572 classified lakes). A minimum of 50 lakes are needed to be sampled between reporting periods to increase statistical confidence in results. The number of lakes sampled (>50) between reporting periods varies depending on available resources. Lake 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 random 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 2012-2013 survey included all lakes designated coldwater and warmwater fish life beneficial uses (572). Three 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 55 classified lakes were sampled during the 2012-2013 growing 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.

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:

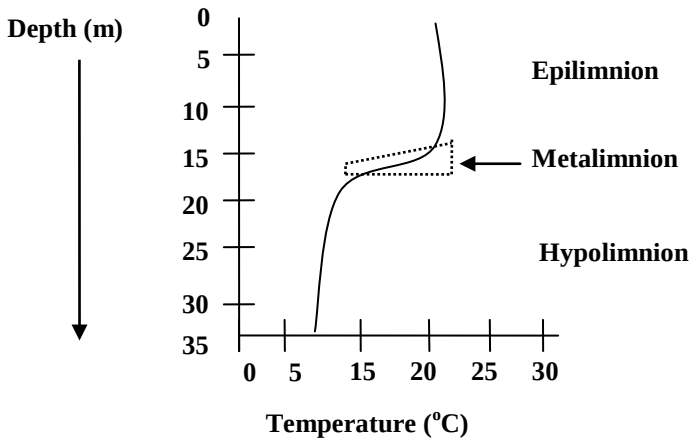
“Epilimnion,” in a thermally-stratified waterbody, the upper stratum of the water column. This layer is generally above the thermocline and is typically uniformly warm, circulating, and well mixed.

“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 3).

Figure 3: 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 impaired.

Lake Assessment Methodology for Nutrient-Related Narrative Standards

South Dakota has a number of narrative water quality standards (74:51:01:05, 74:51:01:06, 74:51:01:08, 74:51:01:09, and 74:51:01:012) designed to protect surface waters from nutrient-related impacts. The following narrative describes the rationale and approach used to evaluate applicable nutrient-related narrative standards and designated use support as part of the 2014 IR lake 303(d) listing methodology.

The Journal Freshwater Science published the study "Using multiple approaches to develop nutrient criteria for lakes in the conterminous USA" (Herlihy et al. 2013). The study utilized data from the 2007 National Lake Assessment (NLA) to evaluate potential approaches to developing nutrient criteria for the national nutrient ecoregions. The importance of this dataset and its evaluation of multiple methods for determining criteria lie within the design of the NLA survey. A geographically randomized sample set of this size is unique amongst data which provides statistical strength that other studies have lacked. It is fully expected that these values will change with the availability and analysis of the 2012 NLA data; however, at this time it represents the best available data.

Several methodologies were evaluated and the first preference was to utilize a paleolimnological approach. The paleolimnological approach is only applicable to natural lakes, which are absent in two of South Dakota's level III ecoregions. The second preference was to use the 75th percentile concentration of the reference site data as an impairment target for individual nutrient regions. Although limitations with this approach were identified, they were less severe than those found with other alternatives evaluated. DENR began collecting data for an ecoregion specific paleolimnological study in 2012 with funds from EPA's supplemental monitoring grants program. Results and data analysis were not available for criteria development during the 2014 reporting cycle.

EPA developed nutrient-related narrative criteria based on multiple lines of evidence to evaluate designated use attainment and/or impairment status of multiple lakes originally proposed for delisting during the 2010 reporting cycle. DENR made the decision to adopt the basic structure of EPA's lake listing methodology for the 2014 reporting cycle. The methodology remains similar though the impairment thresholds for chlorophyll-*a*, nitrogen and phosphorus were changed from those used by EPA in 2010. DENR adopted impairment thresholds based on the 75th percentile of reference site data for specific nutrient regions established by Herlihy et al. (2013). The nutrient regions of significance for the respective level III ecoregions in South Dakota and the associated thresholds are described in Table 9.

Table 9: Nutrient Ecoregion Specific Targets

Nutrient ecoregion		Level III ecoregions in SD	Chl-*a* ug/L	TP ug/L	TN ug/L
II.	Western Mountains	17	NA	NA	NA
IV	Grass Plains (Manmade)	43	13.9	37	513
V.	Cultivated Great Plains	42	49.9	117	1110
VI.	Temperate Plains	46,47	37.8	108	1240

NA=Not Available

Waterbodies in the Black Hills were excluded from the support assessment for the 2014 reporting cycle. The Black Hills fell in the Western Mountains nutrient region or within level III ecoregion 17 in South Dakota. The Western Mountains nutrient region includes natural lakes and reservoirs, many of which are located at high elevations in remote areas of wilderness. Herlihy et al., (2013) identified the likelihood that localized sub-regions may not fit the threshold set forth in the larger regions. In addition, they also discussed difficulty in setting thresholds for reservoirs and the merits of site-specific thresholds. Pending further evaluation, DENR will provide an appropriate chlorophyll-*a* threshold to address nutrient-related standards for waterbodies in the Black Hills in the 2016 Integrated Report.

Growing season (May – September) chlorophyll-*a* concentrations were evaluated during the initial screening process. Waterbodies were considered impaired if the median chlorophyll-*a* concentration and 25% of individual samples exceeded the ecoregion specific threshold. When only one of the chlorophyll thresholds were exceeded, four additional indicators were evaluated and impairment was based on two additional indicators exceeding established thresholds. The following table depicts the different indicators and provides examples for different combinations used in the impairment determination process.

Table 10: Nutrient indicator thresholds and examples of the impairment determination process.

Ave. Chl *a* > threshold	25% Chl *a* > threshold	TP > threshold	TN > threshold	Ave. Secchi <0.7 m	large # rough fish	Status
yes	yes	–	–	–	–	impaired
no	no	–	–	–	–	not impaired
no	yes	no	yes	no	yes	impaired
yes	no	no	yes	no	no	not impaired
no	yes	yes	yes	no	no	impaired

A chlorophyll-*a* threshold of 10 µg/L was used for waterbodies with the beneficial use of Domestic Water Supply waters consistent with EPA's 2010 thresholds. When available, DENR reviewed Game, Fish and Parks Department fish survey reports to evaluate the significance of rough fish (i.e. carp and bullheads). The Secchi depth threshold (< 0.7 m) was based on user perception survey conducted in the Northern Glaciated Plains ecoregion of Minnesota. Swimming was not considered desirable when Secchi depth fell below 0.7 meters according to survey results (Heiskary and Walker 1988). While perception can change in different regions, this threshold was considered for all assessed waterbodies until regionalized thresholds are developed for South Dakota.

In 2010, EPA acknowledged the unique characteristics of the lakes classified as warmwater marginal fisheries and excluded them from the impairment analysis indicating that they may need their own classification. Waterbodies designated with the beneficial use of warmwater marginal fish life propagation were also excluded from the impairment analysis for the 2014 reporting cycle.

All available growing season data from 2000 to 2013 was used to make support and impairment decisions. An individual lake's chlorophyll-*a* can vary due to several natural factors such as sunlight, lake depth, temperature and precipitation. Evaluation of a lake's mean chlorophyll concentration requires sufficient data to account for natural variability. Standard deviation of chlorophyll from its mean also varies widely. A robust estimate of standard deviation is needed to predict required sample size needed to have sufficient power (confidence) to compare a measurement to a threshold. All available data was used to calculate mean and standard deviation to predict an appropriate sample size for waterbodies by ecoregion. Table 11 provides descriptive information and minimum chlorophyll-*a* sample size required for waterbodies to be assessed for an impairment determination. If a water body did not meet the minimum chlorophyll-*a* data requirement, it was considered to have insufficient information to evaluate nutrient-related narrative standards.

Table 11: Analysis of required chlorophyll-*a* sample size by ecoregion.

Ecoregion	Ecoregion Number	Chl Criteria (ug/L)	Log Chl Criteria	Mean Chl A (ug/L)	Mean Log CHL (ug/L)	Mean Log Chl CI (-95)	Mean Log Chl CI (+95)	Required sample size	Number of lakes used
Middle Rockies	17	NA	NA	NA	NA	NA	NA	NA	NA
Northern Glaciated Plains	46	37.8	1.58	18.99	1.05	1.02	1.10	11	28
NW Glaciated Plains	42	49.9	1.70	23.41	1.24	1.16	1.32	5	7
NW Great Plains	43	13.9	1.14	5.56	0.44	0.34	0.53	13	6

NA=Not Available

Ninety-eight lake assessment units were evaluated with nutrient-related narrative criteria. Thirty lakes were considered to fully support designated fishery and recreation uses and twenty-eight lakes did not support those uses. Forty lakes did not have sufficient data to make support determinations based on the ecoregion specific data requirements.

The nutrient-related narratives standards being evaluated (74:51:01:05, 74:51:01:06, 74:51:01:08, 74:51:01:09, and 74:51:01:012) for lakes have implications to both aquatic life and recreation uses. Therefore, support determinations for lakes evaluated for nutrient-related narratives standards were applied to the highest fishery use classification (i.e. 4, 5, 6) and both (7, 8) recreation uses.

Assessment Categories

South Dakota has chosen to use the assessment categories that EPA recommends in its guidance that was issued in July 2005. DENR also added a user-defined sub category (2N). 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;
Subcategory 2N:	Additional data is required to determine if nutrient-related narrative standards 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:	An impairment caused by a pollutant is being addressed by the state through other pollution control requirements;
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.

Support assessment for nutrient-related narrative standards involves monitoring total phosphorus and total nitrogen, followed by biological and habitat assessments.

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 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 2014 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 Tables 7-9.

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. However, DENR coordinates with border states to address water quality concerns.

STATEWIDE SURFACE WATER QUALITY SUMMARY

South Dakota has a total of about 9,726 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 6,160 miles of rivers and streams have been assessed to determine water quality status for a period covering the last five years (October 2008 through September 2013). 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, 30.6% of the assessed stream miles fully support all assigned beneficial uses; a decrease from 35% in the 2012 Integrated Report. 69.4% 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 often associated with high flow events that were sampled during watershed assessment projects.

During this reporting cycle, 5,578 designated stream miles were assessed for fishery/aquatic life beneficial use attainment. Forty-eight percent of assessed stream miles fully supported the fishery/aquatic life uses, a decrease from 53% in the 2012 Integrated Report. 1,381 stream miles were also assessed for immersion recreation attainment; 53.4% fully supported immersion recreation criteria, unchanged from the 2012 Integrated Report.

Nonsupport in assessed streams was caused primarily by *E. coli* bacterial from agricultural nonpoint sources and wildlife. In approximate order of stream miles affected, causes of impairment this reporting cycle include: *E. coli,* total suspended solids, fecal coliform, sodium adsorption ratio (salinity), dissolved oxygen, total dissolved solids, water temperature, specific conductance, unknown (narrative standards), pH, and cadmium. 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). Storm events that produce moderate to significant amounts of precipitation 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 precipitation and runoff events. 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 lakes and reservoirs totaling approximately192,219 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 500 lakes for recreational fishing.

Excluding the four Missouri River reservoirs, an estimated 25% of the 572 lakes have been assessed, accounting for 75.1% of the total lake acreage. An estimated 44.2% (58 lakes) of the lake acreage was considered to support all assessed beneficial uses. This is a decrease from 66% in the 2012 Integrated Report. 55.8% of lake acreage (85 lakes) did not support assessed beneficial uses this cycle. Based on lake acreage, the primary causes of non-support are chlorophyll-*a*, temperature, mercury in fish tissue, dissolved oxygen, pH, and sodium adsorption ratio (salinity). In general, chlorophyll-*a* is attributed to nonpoint source pollution while temperature and sodium adsorption ratio are attributed to natural sources. While many factors influence mercury methylation and bioaccumulation rates, the sources of mercury in fish tissue are mostly atmospheric deposition from point sources and nonpoint sources outside of South Dakota.

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.

Category status comparisons between 2012 and 2014 for streams and lakes are summarized in Tables 12 and 13. The mileage/acreage of use support, causes, and potential sources of impairment for assessed surface waters in South Dakota are summarized in Tables 14 through 19.

Table 12: 2014 Category Status for Rivers and Streams in South Dakota vs 2012

2012			2014		
EPA Category	Total Size (miles)	Number of Assessment Units	EPA Category	Total Size (miles)	Number of Assessment Units
1	1,437.51	55	1	1,183.22	44
2	803.35	17	2	704.16	13
3	559.07	33	3	293.84	17
4A	762.34	27	4A	856.05	33
4B	0	0	4B	0	0
4C	0	0	4C	0	0
5	3,384.79	92	5	3,415.72	94

Table 13: 2014 Category Status for Lakes in South Dakota vs 2012

2012			2014		
EPA Category	Total Size (acres)	Number of Assessment Units	EPA Category	Total Size (acres)	Number of Assessment Units
1	88,673.33	61	1	61,367.56	46
2	1,462.17	11	2	2,418.34	12
3	9,269.17	13	3	8,790.1	13
4A	48.87	3	4A	6,592.12	13
4B	0	0	4B	0	0
4C	0	0	4C	0	0
5	46,507.91	63	5	73,887.62	72

Table 14: 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	-	1,887	1,887
Miles Insufficient Data but Threatened	226	-	226
Miles Not Supporting	-	4,046	4,046
TOTAL	226	5,933	6159

Table 15: 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	-	63,786	63,786
Acres Insufficient Data but Threatened	8,577	-	8,577
Acres not Supporting	-	71,903	71,903
TOTAL	8,577[a]	135,689	144,266

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

Table 16: 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	1,887	4,148	124	294	6159
Domestic Water Supply	803	23	0	7	827
Coldwater Permanent Fish Life	379	244	78	16	701
Coldwater Marginal Fish Life	130	38	0	6	168
Warmwater Permanent Fish Life	216	501	0	70	718
Warmwater Semipermanent Fish Life	1,165	1,390	212	187	2,767
Warmwater Marginal Fish Life	810	414	2	384	1,225
Immersion Recreation	738	644	0	36	1,381
Limited Contact Recreation	2,602	2,108	446	1072	5,155
Fish/Wildlife Prop., Rec., and Stock Watering	5,679	246	0	528	5,925
Irrigation	4,778	792	220	663	5,790
Commerce and Industry	527	0	0	0	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 17: 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	63,786	71,910	8,570	8,790	144,266
Domestic Water Supply	7,995	0	0	0	7,995
Coldwater Permanent Fish Life	853	822	0	0	1,675
Coldwater Marginal Fish Life	146	227	0	0	373
Warmwater Permanent Fish Life	45,925	26,806	106	979	72,837
Warmwater Semipermanent Fish Life	12,609	24,719	282	654	37,610
Warmwater Marginal Fish Life	13,422	9,543	0	9,583	22,964
Immersion Recreation	97,547	32,583	0	16,546	130,130
Limited Contact Recreation	97,547	32,583	0	16,546	130,130
Fish/Wildlife, Prop., Rec., and Stock Watering	125,118	3,964	13,694	9,578	142,776
Irrigation	38,708	5,070	0	0	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 18: Total Sizes of Water Impaired by Various Cause Categories in South Dakota

River/Streams	
Causes/Stressor Category	**Miles**
Cadmium	2
Fecal Coliform	1,880
Dissolved Oxygen	506
pH	26
Salinity/SAR	957
Specific Conductance	236
Temperature	333
Total Dissolved Solids	268
Total Suspended Solids	2,006
Unknown (narrative standards)	36
E. coli	2,079
Lakes/Reservoirs	
Cause/Stressor Category	**Acres**
Dissolved Oxygen	12,288
Chlorophyll-*a*	26,816
Mercury in fish tissue (consumption advisories)	14,082
Nitrates	55
pH	11,553
Selenium	55
Specific Conductance	55
Temperature	14,422
Total Dissolved Solids	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.

Table 19: Total Sizes of Waters Impaired by Various Source Categories in South Dakota

Rivers/Streams	
Source Category (Summarized from ADB*)	**Miles**
Impacts from Abandoned Mines	2
Drought-related Impacts	25
Streambank Modifications/destabilization	77
Municipal Area or Urban Runoff	117
Unknown Sources	127
Wildlife	508
Agricultural Crop Production	865
Natural Sources	1110
Livestock -Grazing or Feeding	1684
Lakes/Reservoirs	
Source Category	**Acres**
Unknown Sources	3,073
Nonpoint Sources	4,411
Natural Sources	5,125

Mileage values generated by ADB are carried out to the 100th decimal place. The table reflects mileage values rounded to the nearest whole number. *The source categories are defined more specifically in ADB and the basin report tables. For this table, sources for rivers and streams are summarized into more general source categories.

Not all sources of impairment have been identified for this reporting cycle. Unidentified sources of impairment have been left blank in Tables 31 – 44 and are not included in the above summary table. Sources of impairment are 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 31 - 44. 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 19. All other impaired lake acres in South Dakota assume a combination of natural and agricultural nonpoint source pollution.

STATEWIDE PROBABILISTIC LAKE ASSESSMENT

During 2012-2013 South Dakota utilized a probabilistic design within the lake monitoring program. 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 representing 192,219 acres in South Dakota that have been identified in the Surface Water Quality Standards as supporting warm or coldwater fisheries. The survey design utilized three strata; targeted lakes, managed fisheries and unmanaged fisheries. Fifty-eight waterbodies were selected for the 2012 and 2013 seasons. Unassessed water bodies were not replaced with alternate waterbodies and the final weightings were adjusted based on the lakes that were sampled. During the assessment, a total of 55 individual water bodies were assessed. The data from the two years was combined to generate a single analysis of the condition of the lakes for the 2014 reporting cycle. The 2010 Integrated Report contained the first statistical survey of South Dakota Lakes. Results from the 2010 and 2012 Integrated Reports are included to provide a framework for future trend analysis. Climate variability cannot be adequately explained with the limited number of reporting cycles and although some indicators show significant increases or decreases, caution should be used with implying trends.

Population Description

South Dakota has 572 lakes identified in the Surface Water Quality Standards as supporting either a coldwater or warmwater fishery. The Missouri River main stem reservoirs are excluded from this dataset. Waterbodies were selected based on characteristics such as depth, size, and permanency. Figure 4 depicts the size distribution of the classified lakes in the state. 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.

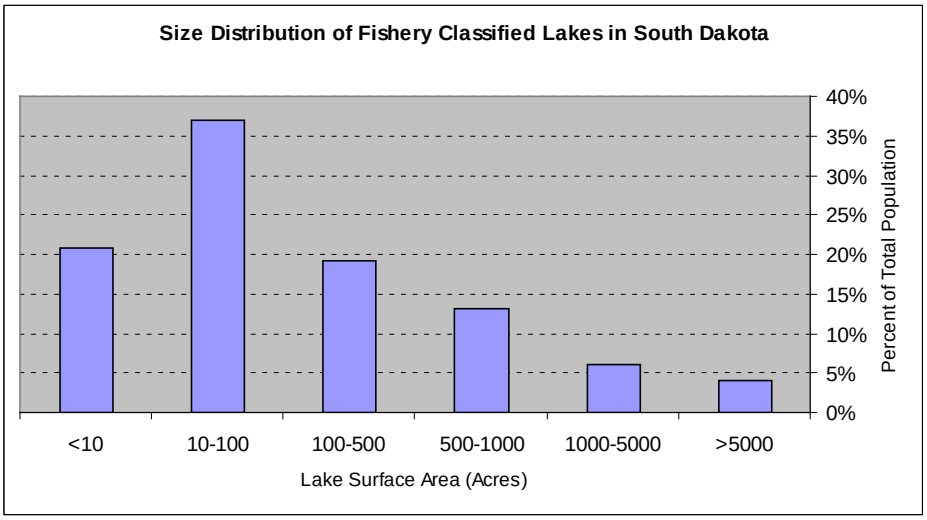


Figure 4: Size Distribution of Fishery Classified Lakes in South Dakota

Lakes are assigned a fishery beneficial use based on physical characteristics (surface area-depth), the type of fish present and survival rates that are expected in that water body. 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 water body 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 Bacteria

To determine the percent of lakes that support their recreational use standards, bacterial samples were collected near the first of June from each of the waterbodies and analyzed for *E. coli* bacteria. Sample site selection was conducted upon 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, samples were collected by wading in at the most convenient access point available. During 2009, an E coli standard was implemented in state statutes for both immersion and limited contact recreation.

The acute criterion for *E. coli* bacteria concentrations was used to evaluate beneficial use support (maximum of 235 and 1178 colonies/ 100mL for immersion and limited contact, respectively). Data from the current and previous statistical surveys indicate a slight decrease in the number of lakes at risk for exceeding bacteria standards for recreation standards (Table 20).

Table 20: Lakes at Risk of Not Supporting Beneficial Uses Due to Bacteria

Beneficial Use	2010		2012		2014	
	Percent	Lakes	Percent	Lakes	Percent	Lakes
Limited Contact	1.3%	7	0.0%	0	0.5%	3
Immersion	9.0%	51	6.2%	35	0.7%	4

Dissolved Oxygen

Dissolved oxygen concentrations are a critical standard for aquatic life survival. South Dakota Water Quality Standards require minimum concentrations based on the fishery classification of the water body. Recreation standards are set at a minimum of 5.0 mg/L for both immersion and limited contact. Dissolved oxygen standards apply anywhere in the water column of a non-stratified water body, or in the epilimnion and metalimnion of a stratified water body. Standards are listed in Table 21.

Table 21: Dissolved Oxygen Standards for Fishery Classes

Fishery	Condition	Min DO
Coldwater permanent	Daily Minimum	6.0
	In spawning areas during spawning season.	7.0
Coldwater marginal	Daily Minimum	5.0
Warmwater permanent	Daily Minimum	5.0
Warmwater semipermanent	Daily Minimum	5.0
Warmwater marginal	Oct 1 to April 30	4.0
	May 1 to Sept 30	5.0

Measurements recorded near the bottom of lakes tended to be lower in dissolved oxygen 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 1 and 3 meters of depth. Dissolved oxygen concentrations were evaluated by two separate methods. Water column maximums were compared to the waterbodies fishery and recreation standards. Water column medians were also evaluated to determine the number of lakes that are at risk of not supporting. Variations in the depth of the epilimnion and metalimnion in stratified lakes may result in full support of the beneficial uses when the lower half of the water column falls below the standard.

A significant reduction in water column median values occurred between the 2010 and 2014 reporting cycles. Depleted oxygen in the entire water column remained statistically similar through the three reporting cycles (Table 22).

Table 22: Lakes at Risk of Not Supporting Beneficial Uses Due to Low Dissolved Oxygen

Criteria Evaluated	2010		2012		2014	
	Percent	Lakes	Percent	Lakes	Percent	Lakes
Water Column Max	4.0%	23	2.3%	13	3.9%	22
Water Column Median	17.0%	97	10.0%	57	5.7%	32

pH

The standard for all of the fishery classified lakes in South Dakota is a maximum pH of 9.0 standard units (su). Historically, South Dakota lakes and reservoirs have not had acidity problems resulting in pH values below the minimum standard of 6.0 standard units. References to impairment risk are limited to lakes that exhibited pH values in excess of 9.0 su. Elevated pH values are frequently linked to high productivity waterbodies resulting from plant and algae photosynthetic activity 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 to buffer significant 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.

Water column maximums were evaluated and percentages represent the number of lakes in which the entire water column exceeded the maximum pH standard of 9.0. Water column medians indicate the number of lakes in which greater than half the water column exceeds the criterion. Lakes with a single sample (water column maximum) that exceeded the criteria are listed in the final row in Table 23. Percentages showed a significant increase from both the 2008-2009 and 2010-2011 periods. A shift in the type of lakes experiencing elevated pH appears to have occurred. The 2008-2009 period included a much greater ratio of stratified lakes had an elevated value near the surface. Lakes with elevated surface values during 2012-2013 showed little to no mixing, resulting in most or the entire water column exceeding the standard.

Table 23: Lakes at Risk of Not Supporting Beneficial Uses Due to High pH

Criteria Evaluated	2010		2012		2014	
	Percent	Lakes	Percent	Lakes	Percent	Lakes
Water Column Min	NA		NA		20.3%	116
Water Column Median	4.0%	23	3.8%	22	23.6%	135
Water Column Max	15.0%	86	6.9%	39	24.8%	141

Temperature

Water column temperatures affect the amount of DO available for aquatic life. Coldwater species are less tolerant of low DO and warm temperatures, particularly during spawn. Table 24 indicates the maximum allowable temperatures for the intended beneficial uses while Figure 5 depicts the distribution of temperatures throughout the water columns of lakes in the various fisheries classes.

Table 24: Temperature Standards for Fishery Uses

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

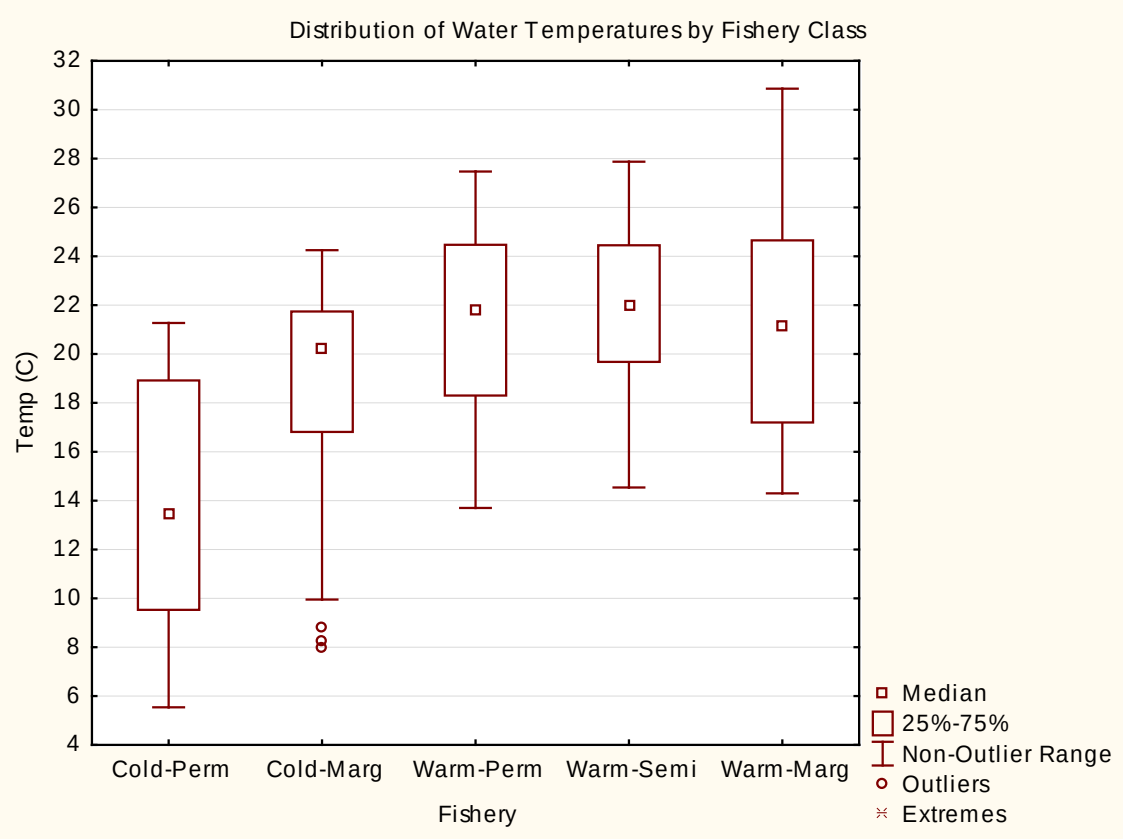


Figure 5: Temperature Distributions by Fishery Class

Similar to previous reports, coldwater permanent fisheries were more likely to have portions of the water column above the standard than other classes. The 2012-2013 reporting period did not include any lakes in the semipermanent or marginal warmwater classes with temperatures above the standard. These lakes are typically shallow and easily influenced by annual climate fluctuations. The majority of the lakes for this reporting cycle were sampled during 2013, which was regionally a relatively cool year, while regional climate during 2012 was one of the warmest on record. All of the temperatures recorded above the standard were collected during 2012 (Table 25).

Table 25: Lakes at Risk of Not Supporting Beneficial Uses as a Result of Elevated Temperatures

Temperature						
Criteria Evaluated	2010		2012		2014	
	Percent	Lakes	Percent	Lakes	Percent	Lakes
Water Column Max	4.0%	23	15.5%	88	5.0%	29
Water Column Median	1.0%	6	9.0%	51	2.2%	13

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 26). The index is based on regression models and logarithmic transformation (scale of 0-100) of

four trophic state indicators: total phosphorus, Secchi depth transparency, total nitrogen 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 and Simpson, 1996).

Table 26: Possible Changes in North Temperate Lakes by Trophic State Gradient

TSI	Chl (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	Hypolimnion 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 hypolimnion, macrophyte problems possible		Warmwater 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

http://www.secchidipin.org/tsi.htm

Consistent with previous reporting cycles, nutrient concentrations did not accurately predict algae concentrations within a majority of the lakes (Figure 6). Total nitrogen distributions more closely matched chlorophyll-*a* and Secchi while phosphorus values were skewed substantially higher than other indicators. 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" (USEPA, 2009).

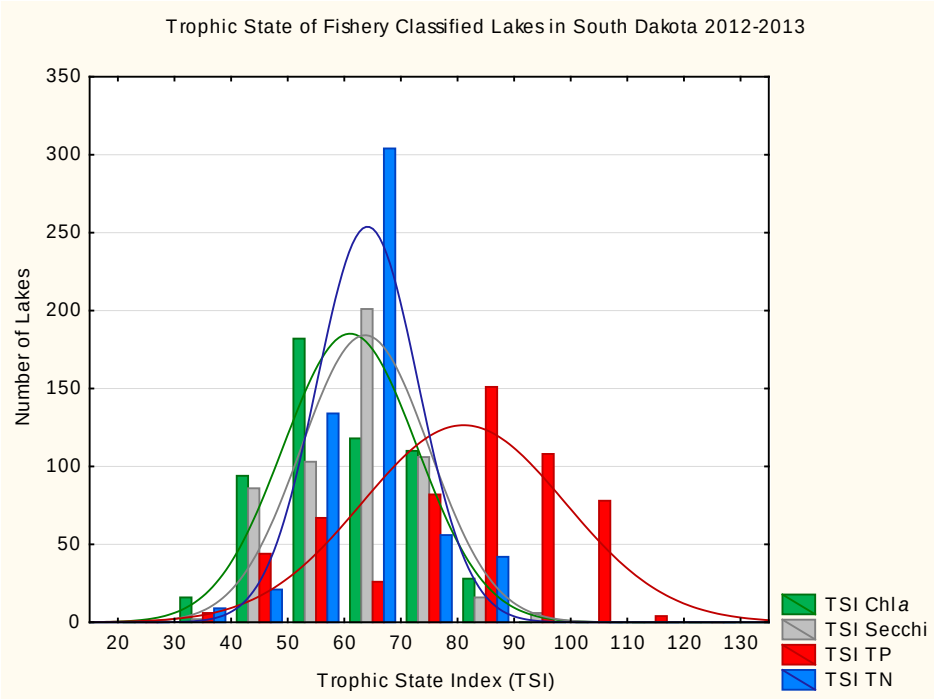


Figure 6: Trophic State of Fishery Classified Lakes in South Dakota 2012-2013

An ordination graph (Carlson and Simpson, 1996) 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 or 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.

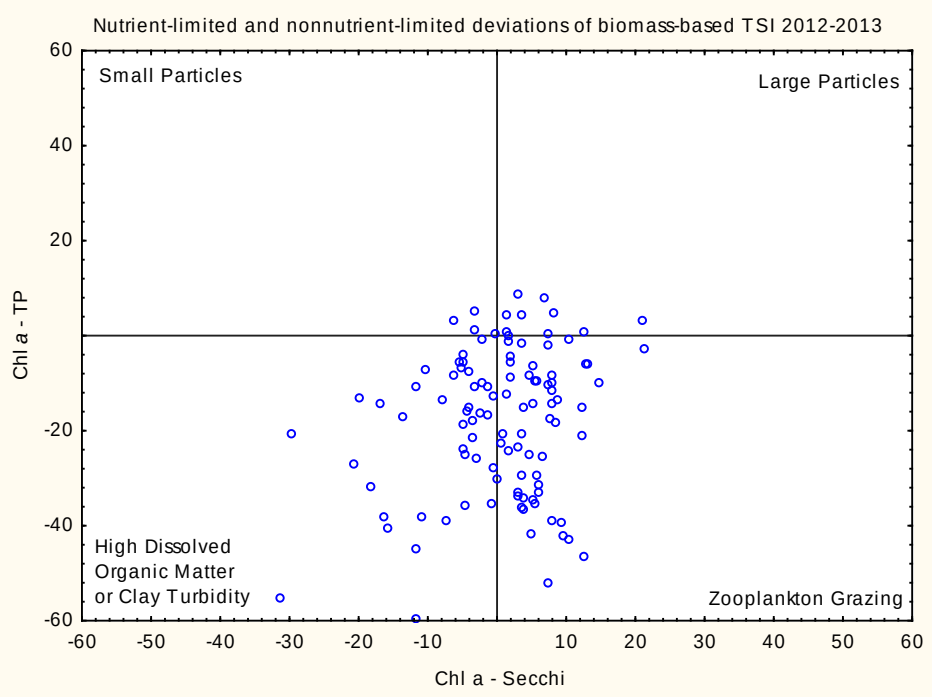


Figure 7: Nutrient and Non-Nutrient Limited Deviations of Biomass-Based TSI 2012-2013

Similar to results reported in 2012, the majority of classified lakes in South Dakota indicate that some variable other than phosphorus is limiting productivity (Table 27). The two reporting periods show a nearly even split between systems dominated by clay turbidity and zooplankton grazing.

Table 27: Percent of Lakes Falling within Ordination Quads

Percent of Lakes Falling within Ordination Quads				
X Axis	Y Axis	2012	2014	
-	-	51.6%	44.5%	High Dissolved Organic Matter (DOM) or clay turbidity, Non P Limited
-	+	3.2%	1.0%	P limitation, Small Particles
+	-	41.2%	52.3%	Zooplankton Grazing, Non P Limitation
+	+	4.0%	2.2%	P limitation, Large Particles

LAKE WATER QUALITY ASSESSMENT

A total of 572 lakes are currently designated for fishery/aquatic life beneficial uses in South Dakota. Thirty-seven assessed lakes in South Dakota have a surface area greater than 1,000 acres and have a combined surface area of 125,453 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 25% of the 572 classified lakes have been assessed accounting for 75.1% of the total lake acreage.

Water quality standards designed to protect designated beneficial uses were evaluated for each lake. Based on numeric water quality standards and nutrient-related narrative standards, 58 lakes fully supported beneficial uses and 85 failed to support one or more beneficial uses (Table 15). Thirteen did not meet the requirements for sufficient data or were not assessed.

A Trophic State Index approach was used to determine the trophic status of assessed lakes (Carlson 1977). The primary trophic state indicators are phosphorus, Secchi depth transparency and chlorophyll-*a*. Carlson (1991) suggests the chlorophyll index provides the best measure of lake productivity and trophic state. The average chlorophyll TSI was used to classify the trophic status of assessed lakes and reservoirs in South Dakota (Table 28).

Table 28: Trophic Status of Assessed Lakes

Trophic Status	Number of Lakes	Acreage of Lakes
Total with Beneficial Use Criteria	572	192,219
Total Assessed	143	144,880
Oligotrophic	1	822
Mesotrophic	24	23,886
Eutrophic	74	91,699
Hypereutrophic	44	28,472
Unknown	8	2,309

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.

Watershed Protection Program

The approach used by the South Dakota Watershed Protection 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 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 South Dakota Department of Agriculture, the United States Natural Resources Conservation Service, GFP, DENR, 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.

Acid Effects on Lakes

During Lake Water Quality Assessments, each lake was measured for field pH. Monitoring efforts (January 2004-September 2013), suggest none of the assessed lakes had acidic pH conditions (Table 29). 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 29: Acid Effects on Lakes

	Number of Lakes	Acreage of Lakes
Assessed for pH	133	135,696
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-September) 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*, 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 independent years of data, it was not included due to insufficient data.

A total of 155 waterbodies were considered assessed for having available chlorophyll data. The chlorophyll TSI trend analysis yielded slopes of less than 5% in nearly all assessed waterbodies indicating stable or non-significant change (Table 30). One lake displayed a borderline positive slope above 5% (5.3%) suggesting increasing algae biomass overtime equating to degrading condition. A total of 34 lakes were considered to have an unknown trend due to insufficient chlorophyll data.

Due to the limited timeframe it is difficult to describe the significance of these conditions. However, it is likely due to natural and seasonal variability natural hydrologic conditions associated with wet and dry cycles. In general, all assessed lakes display relatively stable trophic conditions. A significant amount of TSI data is required to cause a change in trend overtime.

Table 30: Long Term Trends in Assessed Lakes (1989-2013)

	Number of Lakes	Lake Acreage
Assessed for Trends	155	152,606
Improving	0	0
Stable	121	132,924
Degrading	1	80
Unknown	34	20,051
Fluctuating	0	0

RIVER BASIN WATER QUALITY ASSESSMENTS

South Dakota has fourteen major river basins, most of which drain into the Missouri River (Figure 8). 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. Additionally, data submissions from outside organizations and DENR project sponsors increase the extent of waters analyzed and the amount of data used to make support determinations. Those groups include the United States Geological Survey, United States Army Corp of Engineers, United States Bureau of Reclamation, Minnesota Pollution Control Agency, Nebraska Department of Environmental Quality, Wharf Resources, the cities of Watertown and Sioux Falls, East Dakota Water Development District, Pennington County, Belle Fourche River Watershed Partnership, Day County Conservation District, Moody County Conservation District, Custer County, Black Hills Resource Conservation & Development, and South Dakota State University

The fixed ambient monitoring network presently consists of 146 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 metals, including arsenic. Stations that are located near historic uranium mining sites or current uranium exploratory sites are sampled for metals including uranium and two forms of radium radionuclides. 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.

Water quality 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 internal water quality database and EPA's STORET via the Water Quality Exchange Network.

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.

DENR developed assessment methodology to evaluate nutrient-related narrative standards for streams. Twenty assessment units met conditions to be assessed for nutrient-related narrative standards. Eleven assessment units had average total nitrogen and/or total phosphorus concentrations above the respective thresholds. Eight assessment units were placed in user defined category 2N due to requiring either IBI

and/or habitat information. Two assessment units were considered fully supporting and one assessment unit, SD-JA-R-FIRESTEEL_01, was considered impaired.

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.

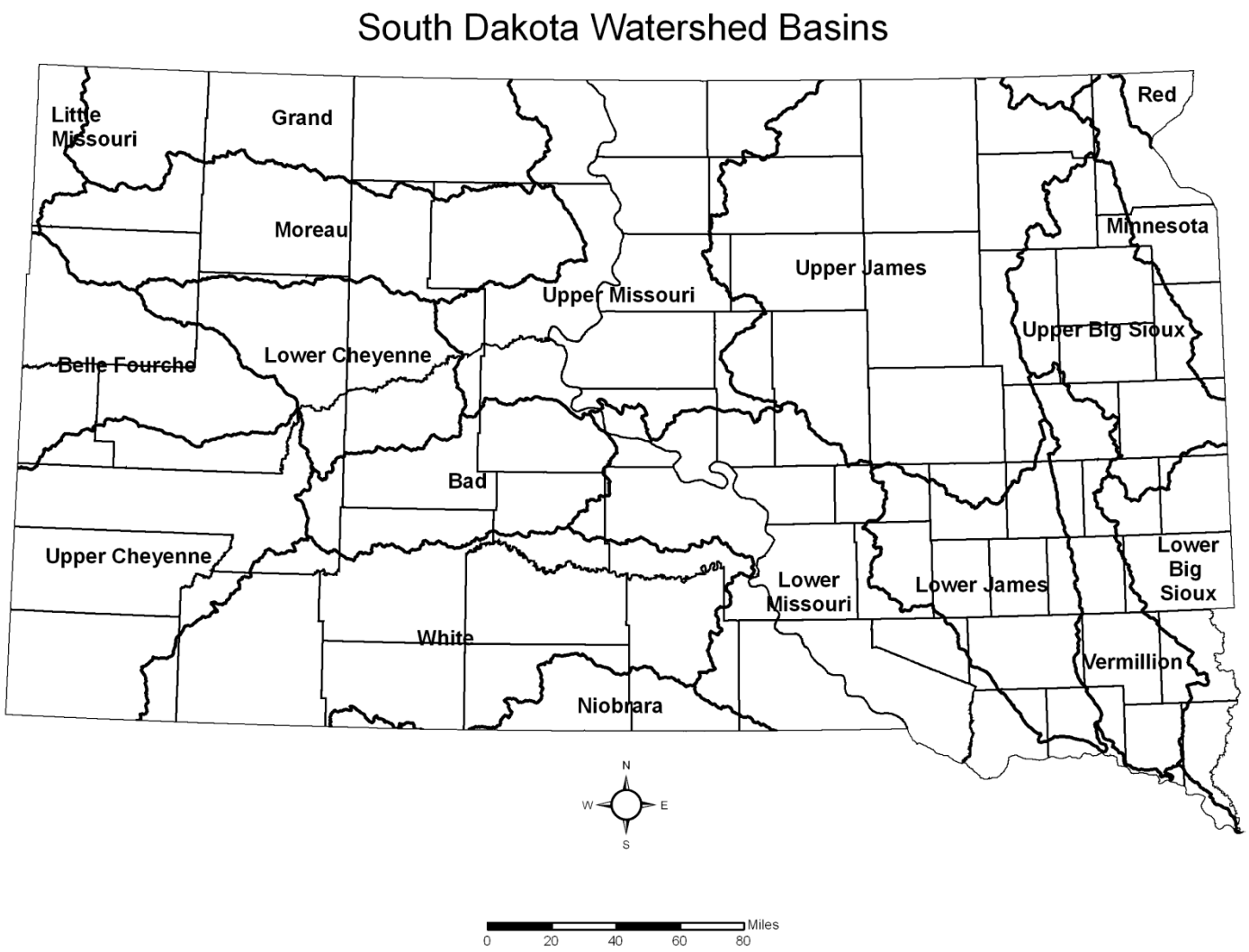


Figure 8: Major River Basins in South Dakota

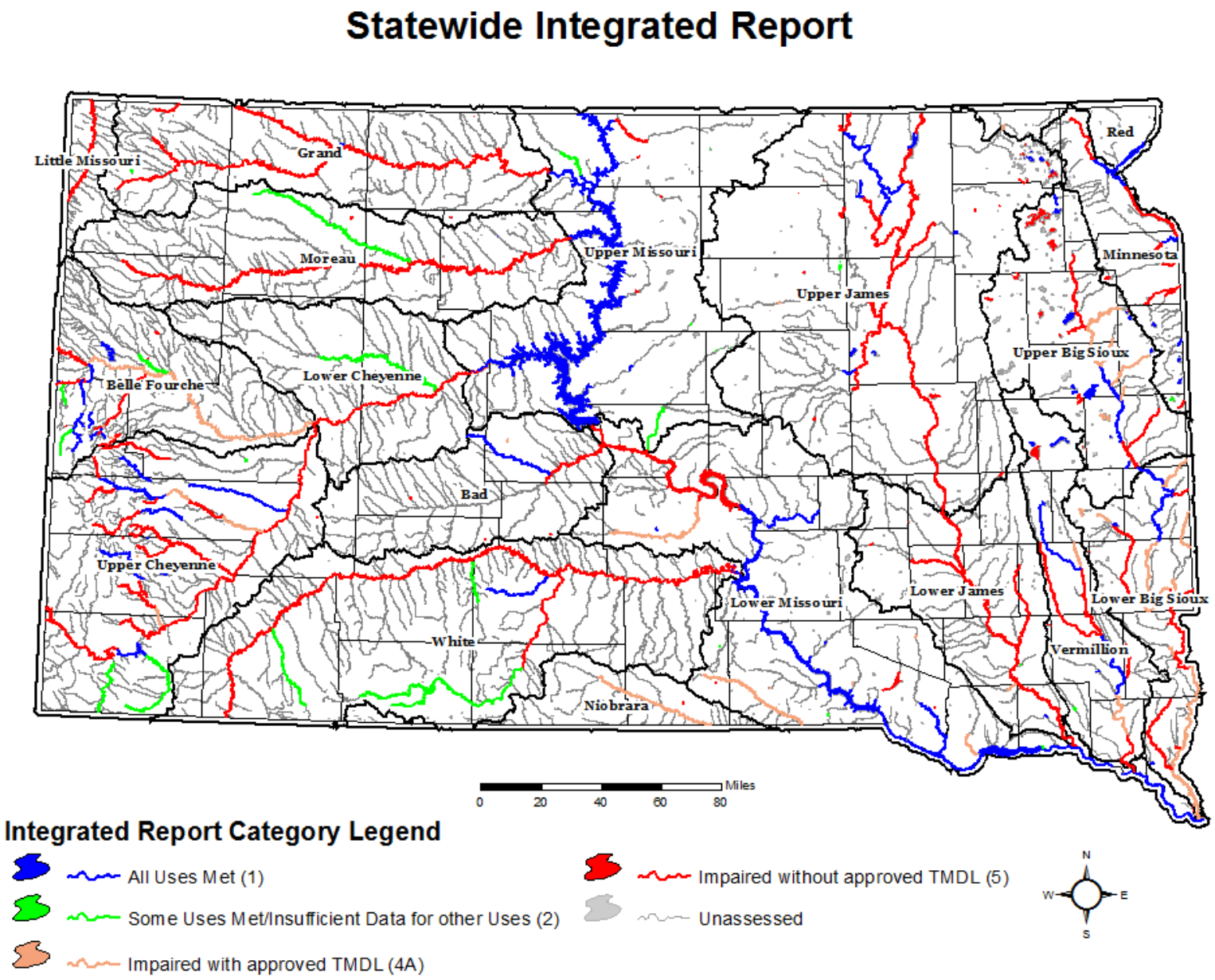


Figure 9: 2012 South Dakota Waterbody Status

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: An impairment caused by a pollutant is being addressed by the state through other pollution control requirements;
Category 4C: Water is impaired by a parameter that is not considered a "pollutant;"
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
** = TMDL development is in Discussions with EPA

Source Categories and Specific Sources in ADB
Agricultural Crop Production
- Crop Production (Crop Land or Dry Land)
- Irrigated Crop Production
- Non-irrigated Crop Production

Drought-related Impacts
Impacts from Abandoned Mines
- Acid Mine Drainage
- Impacts from Abandoned Mine Lands (Inactive)

Livestock – Grazing or Feeding
- Grazing in Riparian or Shoreline Zones
- Livestock (Grazing or Feeding Operations)
- Rangeland Grazing

Municipal Area or Urban Runoff
- Combined Sewer Overflows
- Municipal (Urbanized High Density Area)
- On-site Treatment Systems (Septic Systems and Similar)
- Residential Districts
- Urban Runoff/Storm Sewers

Natural Sources
Nonpoint Sources
Streambank Modifications/destabilization
Unknown Sources
Wildlife

Bad River Basin (Figure 10, Table 31)

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 Philip area. These wells contribute minimal flow to the upper portion of the Bad River. There are prolonged periods of low or no 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.

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 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 warmwater marginal fish life designated use due to exceedances of TSS. A TMDL was approved for TSS in 2001. This reach is also not supporting its irrigation designated use due to exceedances of specific conductance. 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.

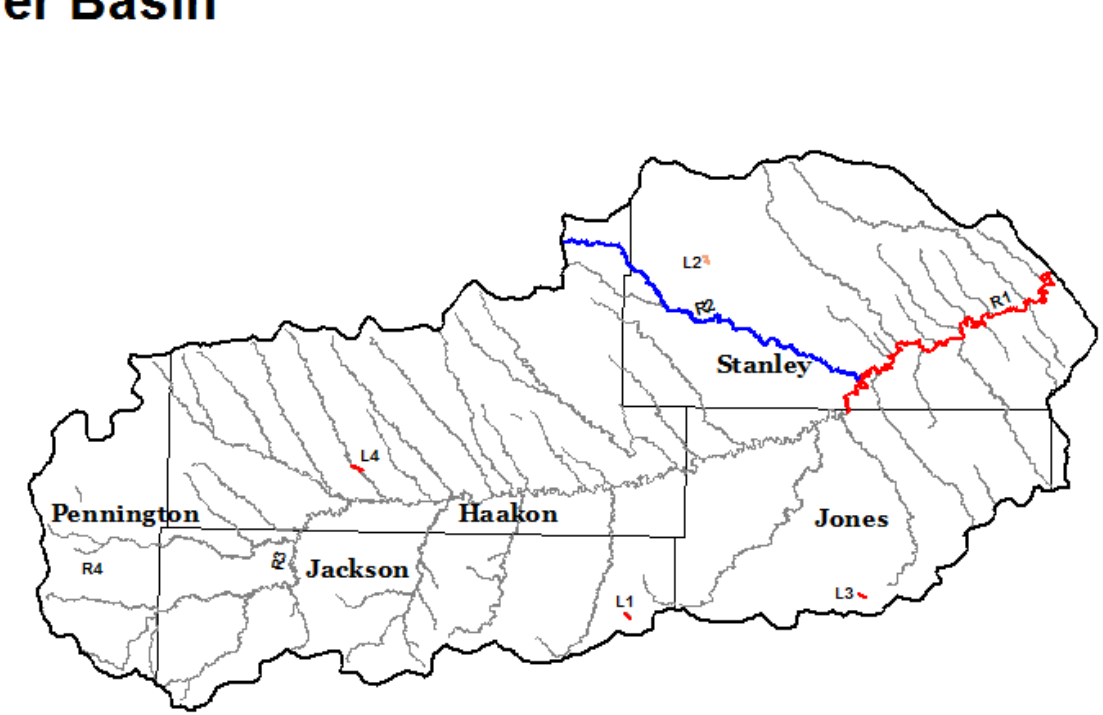
The final assessment of the Bad River National Monitoring Project was completed by DENR and supplemented by research conducted by South Dakota State University (SDSU publication in press). The project was designed to test the effectiveness of BMPs implemented (1991-2002) by documenting water quality and rangeland health improvements. An appreciable decrease in annual sediment load was quantified using loading information from pre-implementation and post-implementation sediment and flow records obtained from a USGS gage near the mouth of the Bad River. The reduction in sediment load was attributed to activities conducted during the relatively long-term implementation effort.

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. D**- TMDL development in Discussions with EPA.

Table 31: Bad River Basin Information

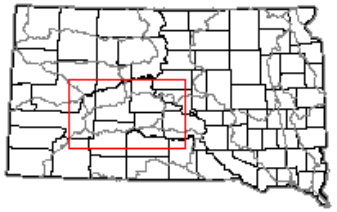
WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Freeman Lake SD-BA-L-FREEMAN_01	Jackson County	L1	DENR	Fish/Wildlife Prop, Rec, Stock	NON	Nitrates	Natural Sources	5*	YES - 2
						Specific Conductance			
						Total Dissolved Solids			
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Permanent Fish Life	NON	Oxygen, Dissolved			
						Chlorophyll-a			
						Selenium	Natural Sources		
Hayes Lake SD-BA-L-HAYES_01	Stanley County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a			
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			5*	YES - 1
				Irrigation Waters	NON	Specific Conductance			
				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	INS			3	NO
				Irrigation Waters	INS				
				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	INS			3	NO
				Irrigation Waters	INS				

Bad 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)



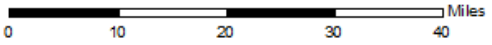


Figure 10: Bad River Basin

Belle Fourche River Basin (Figure 11, Table 32)

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, several small placer mines, and several large decorative stone and bentonite mines. The middle and lower portions of the basin are 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, 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.

Segment SD-BF-R-WILLOW_01_USGS, Willow Creek near Vale, South Dakota, is a stream reach that has been removed from this 2014 Integrated Report. In 2002, the USGS collected field and water quality data during seven site visits. The station has been discontinued since 2002, and data is no longer available for this reach to make support determinations. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

Past and current assessments show Spearfish Creek generally supports its beneficial uses. However, two segments near Elmore showed elevated pH in 2006 and 2008 but were delisted in 2010 for meeting water quality standards. The elevated pH is due largely to the limestone formations located along the course of the stream (natural conditions). In this 2014 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 aging septic and sewer systems, the combined sewer overflow in Lead, and wildlife and livestock. 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. Implementation efforts have primarily focused on irrigation practices to reduce total suspended solids. Recent emphasis is being placed on grazing management practices to reduce bacteria. 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 criteria. 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. D**- TMDL development in Discussions with EPA.

Table 32: 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, water		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, water		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, water		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 - 2
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, water		5	YES - 2
Orman Dam (Belle Fourche Reservoir) SD-BF-L-ORMAN_01	Butte County	L6	DENR	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	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL FULL	Temperature, water		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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Bear Butte Creek	Strawberry Creek to S2, T4N, R4E	R3	DENR	Coldwater Permanent Fish Life	NON	Temperature, water		5*	YES - 2
SD-BF-R-BEAR_BUTTE_02			USGS	Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Belle Fourche River	Wyoming border to Redwater River	R4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
SD-BF-R-BELLE_FOURCHE_01			USGS	Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Wildlife Other than Waterfowl		
							Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL		Urban Runoff/Storm Sewers		
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Total Suspended Solids	Irrigated Crop Production		
Belle Fourche River	Redwater River to Whitewood Creek	R5	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BF-R-BELLE_FOURCHE_02			USGS	Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Total Suspended Solids			
Belle Fourche River	Whitewood Creek to Willow Creek	R6	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BF-R-BELLE_FOURCHE_03				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Total Suspended Solid)	Source Unknown		
Belle Fourche River	Willow Creek to Alkali Creek	R7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BF-R-BELLE_FOURCHE_04			USGS	Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Total Suspended Solids	Source Unknown		
Belle Fourche River	Alkali Creek to mouth	R8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BF-R-BELLE_FOURCHE_05			USGS	Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform			
				Warmwater Permanent Fish Life	NON	Total Suspended Solids	Source Unknown		

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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Cleopatra Creek	Confluence with East Branch Cleopatra Creek to mouth	R9	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			1	NO
SD-BF-R-CLEOPATRA_01				Immersion Recreation	FULL				
				Irrigation Waters Limited Contact Recreation	FULL FULL				
Crow Creek	S22, T6N, R1E to Redwater River	R10	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock	INS FULL			2	NO
SD-BF-R-CROW_01_USGS				Irrigation Waters Limited Contact Recreation	FULL NA				
Deadwood Creek	Rutabaga Gulch to Whitewood Creek	R11	DENR USGS	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			5	YES - 1
SD-BF-R-DEADWOOD_01				Immersion Recreation Irrigation Waters Limited Contact Recreation	NON FULL FULL	Escherichia coli			
False Bottom Creek	S26, T5N, R2E to Burno Gulch Creek	R12	DENR USGS Wharf	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			1	NO
SD-BF-R-FALSE_BOTTOM_01				Irrigation Waters Limited Contact Recreation	FULL FULL				
Fantail Creek	Headwaters to Nevada Gulch	R13	DENR Wharf	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			1	NO
SD-BF-R-FANTAIL_01				Immersion Recreation Irrigation Waters Limited Contact Recreation	FULL FULL FULL				
Horse Creek	Indian Creek to mouth	R14	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NA FULL			2*	NO
SD-BF-R-HORSE_01_USGS									
Little Spearfish Creek	S16, T4N, R1E to Spearfish Creek	R15	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock	FULL FULL			2	NO
SD-BF-R-LITTLE_SPEARFISH_01_USGS				Irrigation Waters Limited Contact Recreation	FULL NA				
Murray Ditch	Above headgate at WY-SD state line	R16	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
SD-BF-R-MURRAY_DITCH_01_USGS									
Redwater River	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
SD-BF-R-REDWATER_01									

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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
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	FULL-TH FULL FULL NA	Temperature, water		5	YES - 2
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 Wharf	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

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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Stewart Gulch	Whitetail Creek to NW1/4, NW1/4, S7, T4N, R3E	R25	DENR Wharf	Coldwater Permanent Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
SD-BF-R-STEWART_01				Limited Contact Recreation	FULL				
Strawberry Creek	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 Acid Mine Drainage	(Inactive)	
SD-BF-R-STRAWBERRY_01				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
West Strawberry Creek	Headwaters to mouth	R27	DENR	Coldwater Permanent Fish Life	FULL			1*	NO
SD-BF-R-W_STRAWBERRY_01				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitetail Creek	Whitewood Creek to S18,T4N, R3E	R28	DENR USGS	Coldwater Permanent Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
SD-BF-R-WHITETAIL_01				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek	Whitetail Summit to Gold Run Creek	R29	DENR	Coldwater Permanent Fish Life	FULL-TH	Temperature, water		5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
SD-BF-R-WHITEWOOD_01				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek	Gold Run Creek to Deadwood Creek	R30	DENR	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
SD-BF-R-WHITEWOOD_02				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Whitewood Creek	Deadwood Creek to Spruce Gulch	R31	DENR	Coldwater Permanent Fish Life	FULL			4A*	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
SD-BF-R-WHITEWOOD_03				Immersion Recreation	NON	Escherichia coli Fecal Coliform	Combined Sewer Overflows Municipal (aging sewer lines)		
				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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Whitewood Creek SD-BF-R-WHITEWOOD_04	Spruce Gulch to Sandy Creek	R32	DENR	Coldwater Permanent Fish Life	FULL			5	YES - 1
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Escherichia coli Fecal Coliform			
				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				
Whitewood Creek SD-BF-R-WHITEWOOD_06	I-90 to Crow Creek	R34	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Permanent Fish Life	NON	pH (high)			
Whitewood Creek SD-BF-R-WHITEWOOD_07	Crow Creek to mouth	R35	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Total Suspended Solids			

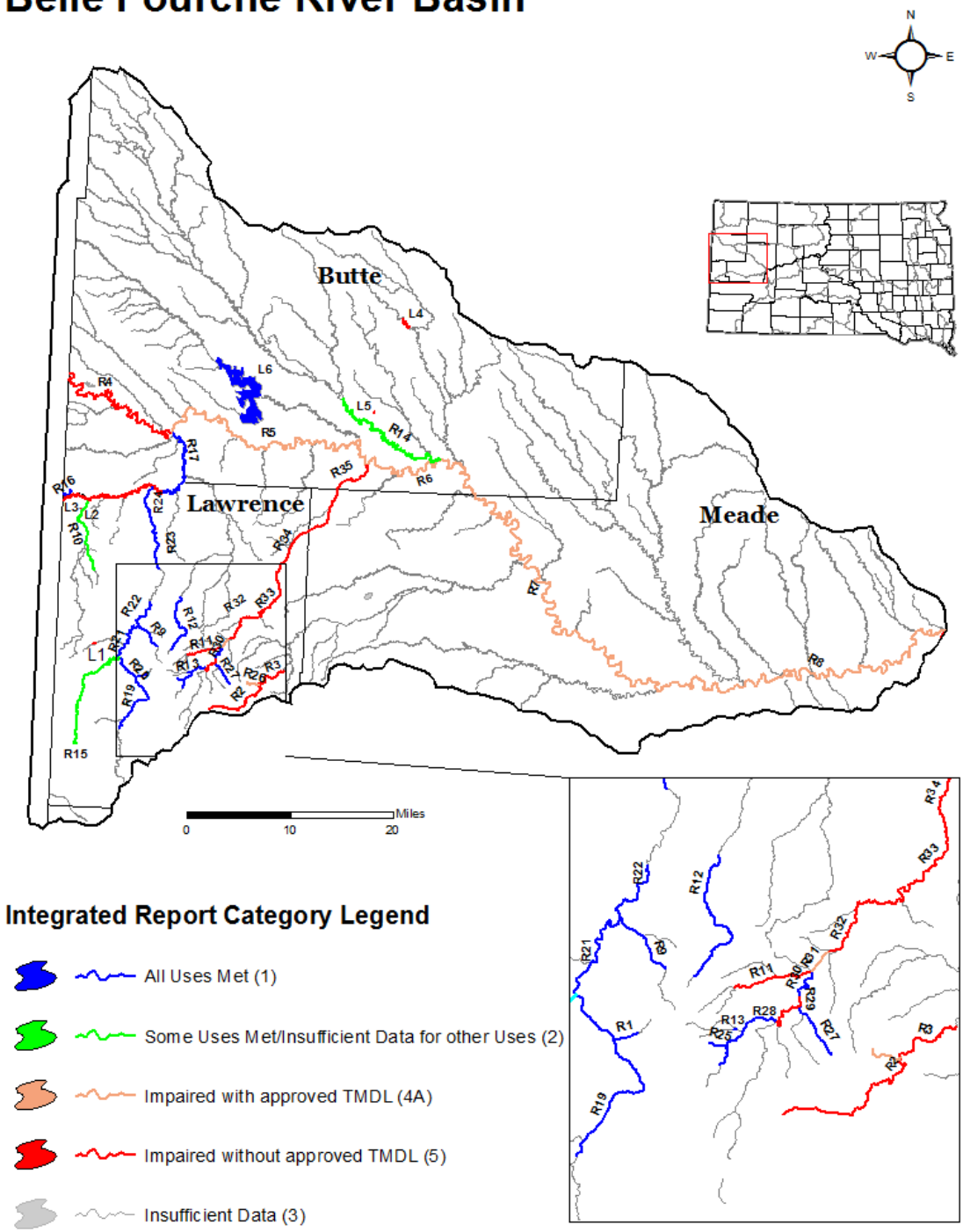


Figure 11: Belle Fourche River Basin

Big Sioux River Basin (Figure 12 and 13, Table 33)

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 37 lakes and maintains 19 water quality monitoring sites within the Big Sioux basin. Seventeen water quality monitoring sites are located on the Big Sioux River. 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, 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 and East Dakota Water Development District supplied water quality data for the Big Sioux River. The city of Sioux Falls and East Dakota Water Development District also supplied water quality data for Skunk Creek. The Minnesota Pollution Control Agency provided water quality data for Beaver Creek, Flandreau Creek, and Pipestone Creek.

Segment SD-BS-R-OWENS_01_USGS is a stream reach on Owens Creek that has been removed from this 2014 Integrated Report. This reach was originally added during the 2008 IR cycle based on data supplied by the USGS. However, due to reduced sampling by USGS, there has been insufficient data to make support determinations in all subsequent IR cycles. Segment SD-BS-R-PATTEE_01 is a stream reach segment on Pattee Creek that is also being removed from this report. This reach was originally added in 2008 because of available data from TMDL assessment work in the basin and data obtained during UAAs. Reporting for this reach is being discontinued because no additional monitoring is planned and data is not being supplied from outside organizations. Therefore, DENR does not have sufficient information and is not able to make a support determination. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

Skunk Creek was assessed for DENR's nutrient-related narrative standards. Average total phosphorus exceeded DENR's threshold. Fish and invertebrate IBIs and habitat scores were not available. This reach has been placed in DENR's subcategory 2N so that scores will be obtained and support of the nutrient-related narrative standards may be determined.

The main causes of nonsupport within the Big Sioux River basin in streams 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, and wet weather discharges and storm sewers within municipal areas. 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 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 glacial soils.

Mercury in fish tissue affects many lakes in the Big Sioux River basin. While there are many factors that influence mercury accumulation in fish, a significant factor in this basin is the expansion of water. In the early 1980's and again in the late 1990's, increased precipitation and snowmelt turned small wetlands into larger lakes. Without natural outlets, many lakes in the northeast continue to gain surface area inundating wetlands and surrounding landscape. Water depth, substrate, and increased organic decay influence the rate that elemental mercury is methylated and converted to the biologically available form of methylmercury. The concentration of mercury in the water column is typically very low and similar to other lakes in the basin. However, the methylation rate is typically higher and results in a greater bioavailability of mercury. This mercury then moves up the food chain and results in excessive mercury in larger, older predator fish.

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 Lake 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 for Blue Dog Lake. DENR collected 20 bacteria samples during the recreation seasons of 2012 and 2013 on Blue Dog Lake. The recreation uses are fully supporting 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 2014 cycle. There is currently insufficient pH data for Blue Dog Lake; however a change in support status cannot be made until additional pH data is obtained. The most recent pH data available for Blue Dog was 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 the upper, north central (Lake Poinsett), central, and lower Big Sioux River. Implementation efforts are also being conducted in the upper portion of the basin under the Northeast Glacial Lakes implementation project. Part of the focus of this project is to protect high quality lakes in the region.

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. D**- TMDL development in Discussions with EPA.

Table 33: 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	NON	Oxygen, Dissolved		5	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	NON	Oxygen, Dissolved			
Lake Alvin SD-BS-L-ALVIN_01	Lincoln County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Temperature, water			
Bitter Lake SD-BS-L-BITTER_01	Day County	L3	DENR	Fish/Wildlife Prop, Rec, Stock	FULL-TH	Mercury in fish tissue	Non-Point Source	5	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Blue Dog Lake SD-BS-L-BLUE_DOG_01	Day County	L4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	pH (high)			
Brant Lake SD-BS-L-BRANT_01	Lake County	L5	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Bullhead Lake SD-BS-L-BULLHEAD_01	Deuel County	L6	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	NON	Chlorophyll-a	Source Unknown		
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a			
Lake Campbell SD-BS-L-CAMPBELL_01	Brookings County	L7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Clear Lake SD-BS-L-CLEAR_D_01	Deuel County	L8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Covell Lake SD-BS-L-COVELL_01	Minnehaha County	L9	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				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. D**- TMDL development in Discussions with 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 NON NON NON	 Chlorophyll-a Chlorophyll-a Chlorophyll-a pH (high)		4A*	NO
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 NON NON NON	 Chlorophyll-a Chlorophyll-a Chlorophyll-a		4A*	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 Warmwater Semipermanent Fish Life	NA NA NA INS-TH	 Mercury in fish tissue	 Non-Point Source	5	YES - 2
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
Lardy Lake SD-BS-L-LARDY_01	Day County	L17	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue		5	YES - 2
Long Lake SD-BS-L-LONG_COD_01	Codington County	L18	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue		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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Lake Madison SD-BS-L-MADISON_01	Lake County	L19	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		4A*	NO
Lake Marsh SD-BS-L-MARSH_01	Hamlin County	L20	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	INS NA NA INS			3	NO
Middle Lynn Lake SD-BS-L-MID_LYNN_01	Day County	L21	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue		5	YES - 2
Minnewasta Lake SD-BS-L-MINNEWASTA_01	Day County	L22	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL-TH NON NON NON	Mercury in fish tissue Chlorophyll-a Chlorophyll-a Chlorophyll-a		5	YES - 2
Lake Norden SD-BS-L-NORDEN_01	Hamlin County	L23	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	L24	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue		5	YES - 2
Pelican Lake SD-BS-L-PELICAN_01	Codington County	L25	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	L26	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	L27	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	L28	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 - 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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
School Lake SD-BS-L-SCHOOL_01	Deuel County	L29	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	L30	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	L31	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL FULL FULL			1	NO
Swan Lake SD-BS-L-SWAN_01	Clark County	L32	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue		5	YES - 2
Twin Lakes/W. Hwy 81 SD-BS-L-TWIN_01	Kingsbury County	L33	DENR	Fish/Wildlife Prop, Rec, Stock	INS-TH	Mercury in fish tissue	Non-Point Source	5	YES - 2
Twin Lakes SD-BS-L-TWIN_02	Minnehaha County	L34	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 - 2
West Oakwood Lake SD-BS-L-W_OAKWOOD_01	Brookings County	L35	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		4A*	NO
Wall Lake SD-BS-L-WALL_01	Minnehaha County	L36	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	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		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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Beaver Creek	Big Sioux River to S9, T98N, R49W	R1	DENR	Fish/Wildlife Prop, Rec, Stock	INS			4A*	NO
			MPCA	Irrigation Waters	INS				
SD-BS-R-BEAVER_01				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	INS				
Beaver Creek	Split Rock Creek to South Dakota-Minnesota border	R2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
SD-BS-R-BEAVER_02						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	NON	Total Suspended Solids			
Big Ditch Creek	Headwaters to S21, T92N,R50W	R3	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
SD-BS-R-BIG_DITCH_01				Irrigation Waters	FULL				
Unnamed tributary to Big Ditch Creek	Headwaters to Big Ditch Creek	R4	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
SD-BS-R-BIG_DITCH_TRIB_01				Irrigation Waters	INS				
Big Sioux River	S28, T121N, R52W To Lake Kampeska	R5	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
			USGS	Irrigation Waters	FULL				
SD-BS-R-BIG_SIOUX_01				Limited Contact Recreation	NON	Escherichia coli			
						Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			
Big Sioux River	Lake Kampeska to Willow Creek	R6	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
			USGS	Irrigation Waters	FULL				
SD-BS-R-BIG_SIOUX_02			Watertown EDWDD	Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			
Big Sioux River	Willow Creek to Stray Horse Creek	R7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
			USGS	Irrigation Waters	FULL				
SD-BS-R-BIG_SIOUX_03			EDWDD	Limited Contact Recreation	NON	Escherichia coli	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	FULL				
Big Sioux River	Stray Horse Creek to near Volga	R8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
			USGS	Irrigation Waters	FULL				
SD-BS-R-BIG_SIOUX_04			EDWDD	Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				

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WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Big Sioux River SD-BS-R-BIG_SIOUX_05	Near Volga to Brookings	R9	DENR EDWDD	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids		5	YES - 1
Big Sioux River SD-BS-R-BIG_SIOUX_06	Brookings to Brookings/Moody County Line	R10	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Total Suspended Solids		5	YES - 1
Big Sioux River SD-BS-R-BIG_SIOUX_07	Brookings/Moody County Line to S2, T104N, R49W	R11	DENR USGS EDWDD	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL FULL	 		1*	NO
Big Sioux River SD-BS-R-BIG_SIOUX_08	S2, T104N, R49W to I-90	R12	DENR USGS Sioux Falls EDWDD	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Fecal Coliform Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON FULL FULL NON	 Escherichia coli Livestock (Grazing or Feeding Operations) Total Suspended Solids	 Crop Production (Crop Land or Dry Land)	4A*	NO
Big Sioux River SD-BS-R-BIG_SIOUX_10	I-90 to diversion return	R13	DENR USGS EDWDD	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL NON FULL NON NON	 Escherichia coli Fecal Coliform Escherichia coli Fecal Coliform Total Suspended Solids	 Municipal (Urbanized High Density Area) Residential Districts 	4A*	NO
Big Sioux River SD-BS-R-BIG_SIOUX_11	Diversion return to SF WWTF	R14	DENR USGS Sioux Falls EDWDD	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON FULL NON NON	 Escherichia coli Fecal Coliform Escherichia coli Fecal Coliform Total Suspended Solids	 Municipal (Urbanized High Density Area) Livestock (Grazing or Feeding Operations) 	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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Big Sioux River	SF WWTF to above	R15	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
	Brandon		Sioux Falls	Immersion Recreation	NON	Escherichia coli			
SD-BS-R-BIG_SIOUX_12						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
						Fecal Coliform			
				Warmwater Semipermanent Fish Life	FULL	Total Suspended Solids			
Big Sioux River	Above Brandon to	R16	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
	Nine Mile Creek		EDWDD	Immersion Recreation	NON	Escherichia coli			
SD-BS-R-BIG_SIOUX_13						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			
Big Sioux River	Nine Mile Creek to	R17	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
	Near Fairview			Immersion Recreation	NON	Escherichia coli			
SD-BS-R-BIG_SIOUX_14						Fecal Coliform	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	Fairview to near	R18	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-BS-R-BIG_SIOUX_15	Alcester			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	Grazing in Riparian or Shoreline Zones		
							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. D**- TMDL development in Discussions with 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	Livestock (Grazing or Feeding Operations)		
							Grazing in Riparian or Shoreline Zones		
				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	NON	Escherichia coli			
						Fecal Coliform	Grazing in Riparian or Shoreline Zones		
				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			5*	YES - 1
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
SD-BS-R-BRULE_01				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
				Irrigation Waters	INS				
				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
SD-BS-R-EAST_BRULE_01				Warmwater Marginal Fish Life	NON	Total Suspended Solids			
Flandreau Creek	Big Sioux River to Minnesota Border	R23	DENR USGS MPCA	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
				Irrigation Waters	FULL				
SD-BS-R-FLANDREAU_01				Limited Contact Recreation	NON	Escherichia coli			
				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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Hidewood Creek	Big Sioux River to U.S. Highway 77	R24	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			4A*	NO
SD-BS-R-HIDEWOOD_01				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	FULL				
Jack Moore Creek	Big Sioux River to S33, T107N, R49W	R25	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3*	NO
SD-BS-R-JACK_MOORE_01				Limited Contact Recreation Warmwater Marginal Fish Life	INS INS				
North Deer Creek	Six Mile Creek to U.S. Highway 77	R26	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			3*	NO
SD-BS-R-NORTH_DEER_01				Limited Contact Recreation Warmwater Marginal Fish Life	INS INS				
Peg Munky Run	Big Sioux River to S17, T113N, R50W	R27	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	INS INS			4A*	NO
SD-BS-R-PEG_MUNKY_RUN_01				Limited Contact Recreation	NON	Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Marginal Fish Life	INS				
Pipestone Creek	Split Rock Creek to Minnesota border	R28	DENR USGS MPCA	Fish/Wildlife Prop, Rec, Stock Immersion Recreation	FULL NON	 Escherichia coli		4A*	NO
SD-BS-R-PIPESTONE_01						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Six Mile Creek	Big Sioux River to S30, T112N, R48W	R29	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
SD-BS-R-SIXMILE_01				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform			
				Warmwater Marginal Fish Life	NON	Total Suspended Solids			
Skunk Creek	Brandt Lake to Big Sioux River	R30	DENR USGS Sioux Falls EDWDD	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
SD-BS-R-SKUNK_01				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli 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. D**- TMDL development in Discussions with 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	R31	DENR USGS	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON FULL FULL-TH FULL	 Fecal Coliform Fecal Coliform 	 Livestock (Grazing or Feeding Operations) 	4A*	NO
Spring Creek SD-BS-R-SPRING_01	Big Sioux River to S22, T109, R47W	R32	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	INS INS INS-TH INS	 Fecal Coliform 	 Livestock (Grazing or Feeding Operations) 	4A*	NO
Stray Horse Creek SD-BS-R-STRAYHORSE_01	Big Sioux River to S26, T116N, R51W	R33	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	INS INS INS-TH INS	 Fecal Coliform 	 Livestock (Grazing or Feeding Operations) 	4A*	NO
Union Creek SD-BS-R-UNION_01	Big Sioux River to confluence with East and West Forks	R34	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	INS INS INS-TH INS-TH	 Fecal Coliform Total Suspended Solids	 Livestock (Grazing or Feeding Operations) 	5*	YES - 1
Willow Creek SD-BS-R-WILLOW_01	Big Sioux River to S7, T117N, R50W	R35	DENR 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

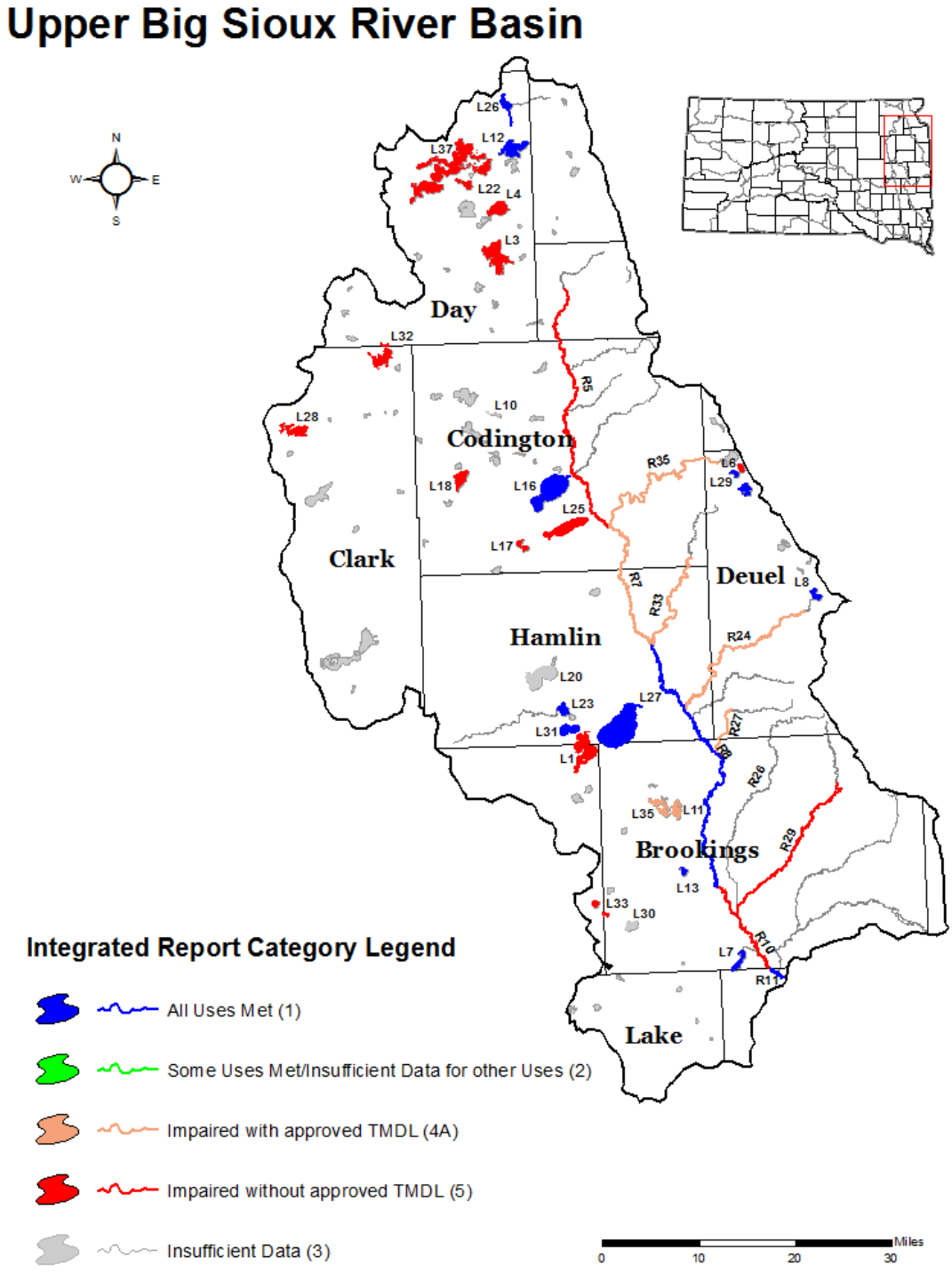

Figure 12: Upper Big Sioux River Basin

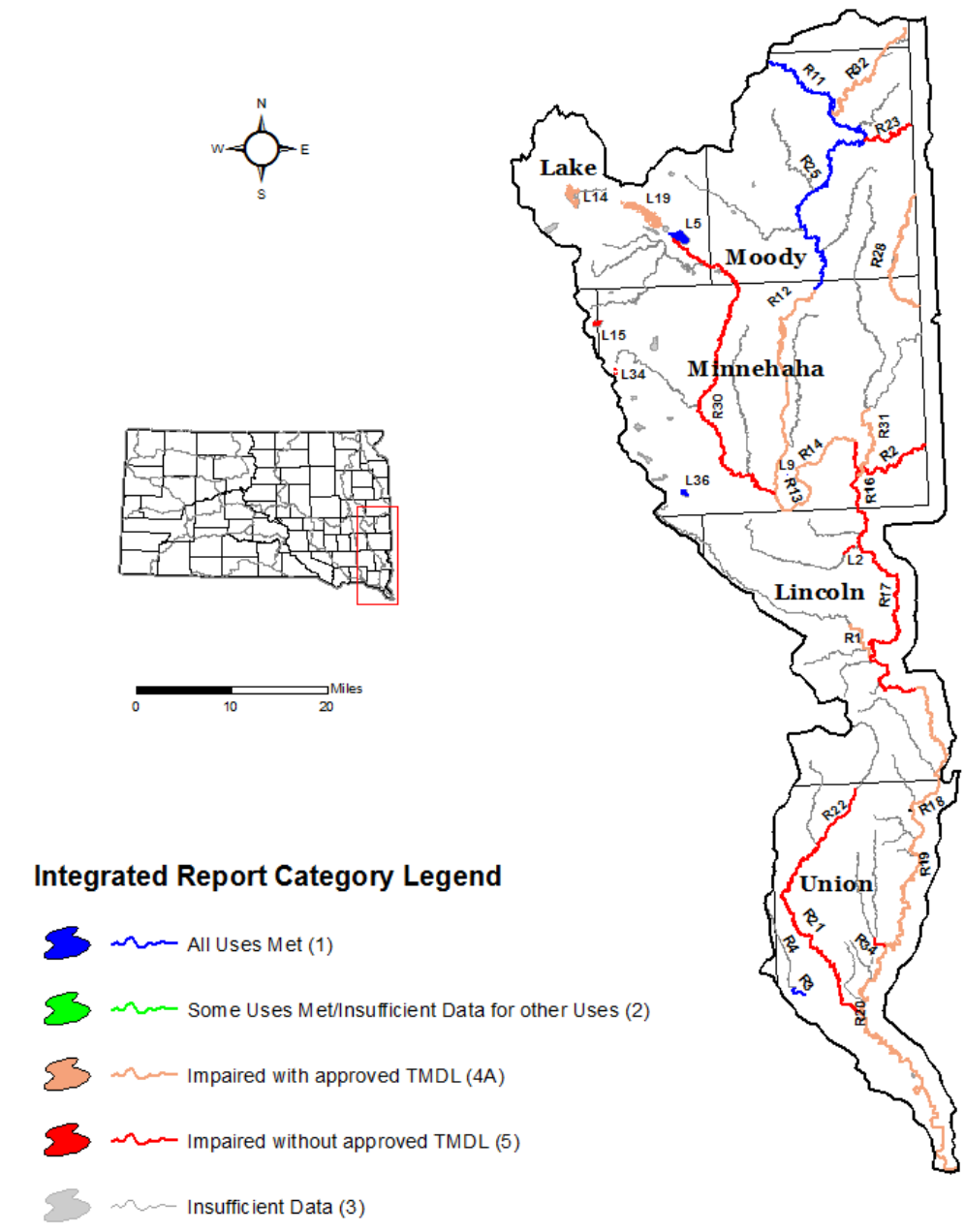

Figure 13: Lower Big Sioux River Basin

Cheyenne River Basin (Figures 14 and 15, Table 34)

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.

Temperature is the primary cause of impairment for lakes in the Cheyenne River basin. All temperature impairments on these lakes are due to exceedances to the temperature criterion for the coldwater permanent fish life beneficial use. TMDL development has not been initiated for any of these lakes; therefore, sources of the temperature impairments have not been identified. In general, ambient air temperature and solar radiation affect water temperature during the peak summer months.

The USGS also maintains a number of water quality monitoring sites located along streams in the Cheyenne River Basin including: Battle Creek, 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 and Pactola Reservoir.

Segments SD-CH-R-BEAR_GULCH_01_USGS, SD-CH-R-COLD_SPRINGS_01_USGS, SD-CH-R-LIME_01_USGS, SD-CH-R-LINDSEY_DRAW_01_USGS, and SD-CH-R-PASS_01_USGS are reaches that are being removed from this 2014 Integrated Report. These reaches were monitored by USGS but sampling has been reduced or discontinued and sufficient data is no longer being collected to make waterbody support determinations. Other than Cold Springs, these reaches have had insufficient data since the 2008 IR cycle. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

The Cheyenne River basin is home to deposits of natural uranium, historic uranium mining, and current exploration drilling. DENR maintains five water quality monitoring locations within the basin to monitor for uranium and other associated parameters. For this 2014 reporting cycle, there are no exceedances to surface water quality standards 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. Most of the Cheyenne River drainage basin contains highly erodible soils. The landscape contributes considerable amounts of eroded sediment during periods of heavy rainfall. During normal or lower flow periods, the upper Cheyenne often exceeds irrigation water quality standards for specific conductance and sodium adsorption ratio. All segments downstream of the Fall River remain nonsupporting for fecal coliform, *E.coli*

bacteria, and total suspended solids. These segments have approved TMDLs for bacteria. Site specific water quality standards for total suspended solids based on the natural condition will be proposed during DENR's next triennial review of the surface water quality standards.

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 criteria. DENR is working with RESPEC and EPA to incorporate information recommended in the *Black Hills Regional Stream Temperature Assessment* into state water quality standards. Once approved, DENR will use the recommended temperature criterion to determine support.

No 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. D**- TMDL development in Discussions with EPA.

Table 34: 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, water		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, water		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	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL INS INS	Temperature, water		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. D**- TMDL development in Discussions with 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, water		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, water		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, water		5*	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	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. D**- TMDL development in Discussions with EPA.

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 Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL FULL	Temperature, water		5	YES - 2
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	Escherichia coli Fecal Coliform		5	YES - 1
Battle Creek SD-CH-R-BATTLE_02	Teepee Gulch Creek To SD HWY 79	R3	DENR USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NON	Temperature, water Escherichia coli Fecal Coliform		5	YES - 1
Beaver Creek SD-CH-R-BEAVER_01	WY border to Cheyenne River	R4	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	NON NON FULL FULL	Specific Conductance Total Dissolved Solids Salinity (SAR) Specific Conductance		5*	YES - 2
Beaver Creek SD-CH-R-BEAVER_01_USGS	Near Buffalo Gap	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Permanent Fish Life	INS INS NON INS	Fecal Coliform		4A*	NO
Beaver Creek SD-CH-R-BEAVER_02_USGS	S13, T5N, R4E to SD Hwy 79	R6	USGS	Coldwater Permanent Fish Life Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation	NON FULL FULL NA	Temperature, water		5	YES - 2
Box Elder Creek SD-CH-R-BOX_ELDER_01	Cheyenne River to S22, T2N, R8E	R7	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	R8	DENR USGS	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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Castle Creek	Deerfield Reservoir To Rapid Creek	R9	DENR USGS	Coldwater Permanent Fish Life	NON	Total Suspended Solids		5	YES - 1
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	R10	DENR	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	R11	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
SD-CH-R-CHEYENNE_01				Irrigation Waters	NON	Salinity (SAR) Specific Conductance			
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Cheyenne River	Beaver Creek to Cascade Creek	R12	DENR USGS	Fish/Wildlife Prop, Rec, Stock	NON	Specific Conductance		5	YES - 1
SD-CH-R-CHEYENNE_02						Total Dissolved Solids	Crop Production (Crop Land or Dry Land) Livestock (Grazing or Feeding Operations) Natural Sources		
				Irrigation Waters	NON	Salinity (SAR) Specific Conductance	Crop Production (Crop Land or Dry Land) Livestock (Grazing or Feeding Operations) Natural Sources		
				Limited Contact Recreation	NON	Escherichia coli			
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Cheyenne River	Cascade Creek to Angostura Reservoir	R13	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	R14	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	FULL				
				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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Cheyenne River	Cedar Creek to Belle Fourche River	R15	DENR	Fish/Wildlife Prop, Rec, Stock	NON	Total Dissolved Solids		5*	YES - 1
SD-CH-R-CHEYENNE_04			USGS	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	Belle Fourche River To Bull Creek	R16	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
SD-CH-R-CHEYENNE_05			USGS	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	Bull Creek to Lake Oahe	R17	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 1
SD-CH-R-CHEYENNE_06				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			
Elk Creek	S9, T3N, R7E to S27,T4N, R3E	R18	DENR	Coldwater Permanent Fish Life	INS-TH	Temperature, water		5	YES - 2
SD-CH-R-ELK_01_USGS			USGS	Fish/Wildlife Prop, Rec, Stock	INS				
				Immersion Recreation	NA				
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
Elm Creek	near Fairpoint, Red Owl, SD	R19	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
SD-CH-R-ELM_01_USGS				Irrigation Waters	INS				
Fall River	Hot Springs to mouth	R20	DENR	Coldwater Marginal Fish Life	NON	Temperature, water		5	YES - 2
SD-CH-R-FALL_01			USGS	Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Temperature, water	Natural Sources		

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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Flynn Creek SD-CH-R-FLYNN_01	SF Lame Johnny Creek to S23, T4S, R5E	R21	DENR	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
French Creek SD-CH-R-FRENCH_01	S23, T3S, R3E to Custer	R22	DENR USGS	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
French Creek SD-CH-R-FRENCH_02	Custer to Stockade Lake	R23	DENR USGS	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
French Creek SD-CH-R-FRENCH_03	Stockade Lake to SD HWY 79	R24	DENR USGS	Coldwater Marginal Fish Life	FULL			1	NO
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Grace Coolidge Creek SD-CH-R-GRACE_COOLIDGE_01	S12, T3S, R5E to Battle Creek	R25	DENR USGS	Coldwater Permanent Fish Life	NON	Temperature, water	Drought-related	5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Grizzly Bear Creek SD-CH-R-GRIZZLY_BEAR_01_USGS	Near Keystone, SD	R26	USGS	Coldwater Permanent Fish Life	NON	Temperature, water		5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	INS				
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
Hat Creek SD-CH-R-HAT_01_USGS	Near Edgemont, SD	R27	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	INS				
				Warmwater Semipermanent Fish Life	INS				
Highland Creek SD-CH-R-HIGHLAND_01_USGS	Wind Cave Natl Park And near Pringle, SD	R28	USGS	Coldwater Permanent Fish Life	INS-TH	pH (high) Temperature, water	Natural Sources	5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	INS				
				Irrigation Waters	INS				
				Limited Contact Recreation	INS				
Horsehead Creek SD-CH-R-HORSEHEAD_01_USGS	at Oelrichs	R29	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	INS				
				Warmwater Semipermanent Fish Life	INS				

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WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Hot Brook Creek SD-CH-R-HOT_BROOK_01	Fall River to S19, T7S, R5E	R30	DENR	Coldwater Marginal Fish Life	NON	Temperature, water	Natural Sources	5	YES - 2
				Domestic Water Supply	NA				
				Fish/Wildlife Prop, Rec, Stock	NA				
				Irrigation Waters	NA				
Rapid Creek SD-CH-R-RAPID_01	Headwaters to Pactola Reservoir	R31	DENR USGS	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				
Rapid Creek SD-CH-R-RAPID_02	Pactola Reservoir to Canyon Lake	R32	DENR USGS	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				
Rapid Creek SD-CH-R-RAPID_03	Canyon Lake to S15, T1N, R8E	R33	DENR USGS	Coldwater Permanent Fish Life	FULL			4A*	NO
				Domestic Water Supply	FULL				
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Fecal Coliform	Urban Runoff/Storm Sewers		
							On-site Treatment Systems (Septic Systems Decentralized Systems)		
							Livestock (Grazing or Feeding Operations)		
							Crop Production (Crop Land or Dry Land)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Rapid Creek SD-CH-R-RAPID_04	S15, T1N, R8E to Above Farmingdale	R34	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES-1
				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	On-site Treatment Systems (Septic Systems Decentralized Systems)		
							Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Rapid Creek SD-CH-R-RAPID_05	Above Farmingdale to Cheyenne River	R35	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent 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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
North Fork Rapid Creek	From confluence with Rapid Creek to S8, T3N, R3E	R36	DENR	Coldwater Permanent Fish Life	INS-TH	Temperature, water		5	YES - 2
				Fish/Wildlife Prop, Rec, Stock	INS				
				Irrigation Waters	NA				
SD-CH-R-RAPID_N_FORK_01				Limited Contact Recreation	INS				
Reno Gulch	Near Hill City, SD	R37	USGS	Coldwater Marginal Fish Life	INS			3	NO
SD-CH-R-RENO_GULCH_01_USGS				Fish/Wildlife Prop, Rec, Stock	INS				
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
Rhoads Fork	Near Rochford, SD	R38	USGS	Coldwater Permanent Fish Life	INS			3	NO
SD-CH-R-RHOADS_FORK_01_USGS				Fish/Wildlife Prop, Rec, Stock	INS				
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
Spring Creek	S5, T2S, R3E to Sheridan Lake	R39	DENR USGS	Coldwater Permanent Fish Life	NON	Temperature, water Total Suspended Solids		5*	YES - 1
SD-CH-R-SPRING_01		Pennington County							
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	NON	Fecal Coliform	Wildlife Other than Waterfowl		
						Escherichia coli	Urban Runoff/Storm Sewers		
							On-site Treatment Systems (Septic Systems and Decentralized Systems)		
							Livestock (Grazing or Feeding Operations)		
				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform			
Spring Creek	Sheridan Lake to SD HWY 79	R40	DENR USGS	Coldwater Marginal Fish Life	FULL			1	NO
SD-CH-R-SPRING_02				Fish/Wildlife Prop, Rec, Stock	FULL				
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
Sunday Gulch	S18, T2S, T5E to Headwaters	R41	DENR USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
SD-CH-R-SUNDAY_GULCH_01_USGS				Irrigation Waters	INS				
Victoria Creek	Rapid Creek to S19, T1N, R6E	R42	DENR USGS	Coldwater Permanent Fish Life	NON	Temperature, water		5	YES - 2
SD-CH-R-VICTORIA_01_USGS				Fish/Wildlife Prop, Rec, Stock	INS				
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				

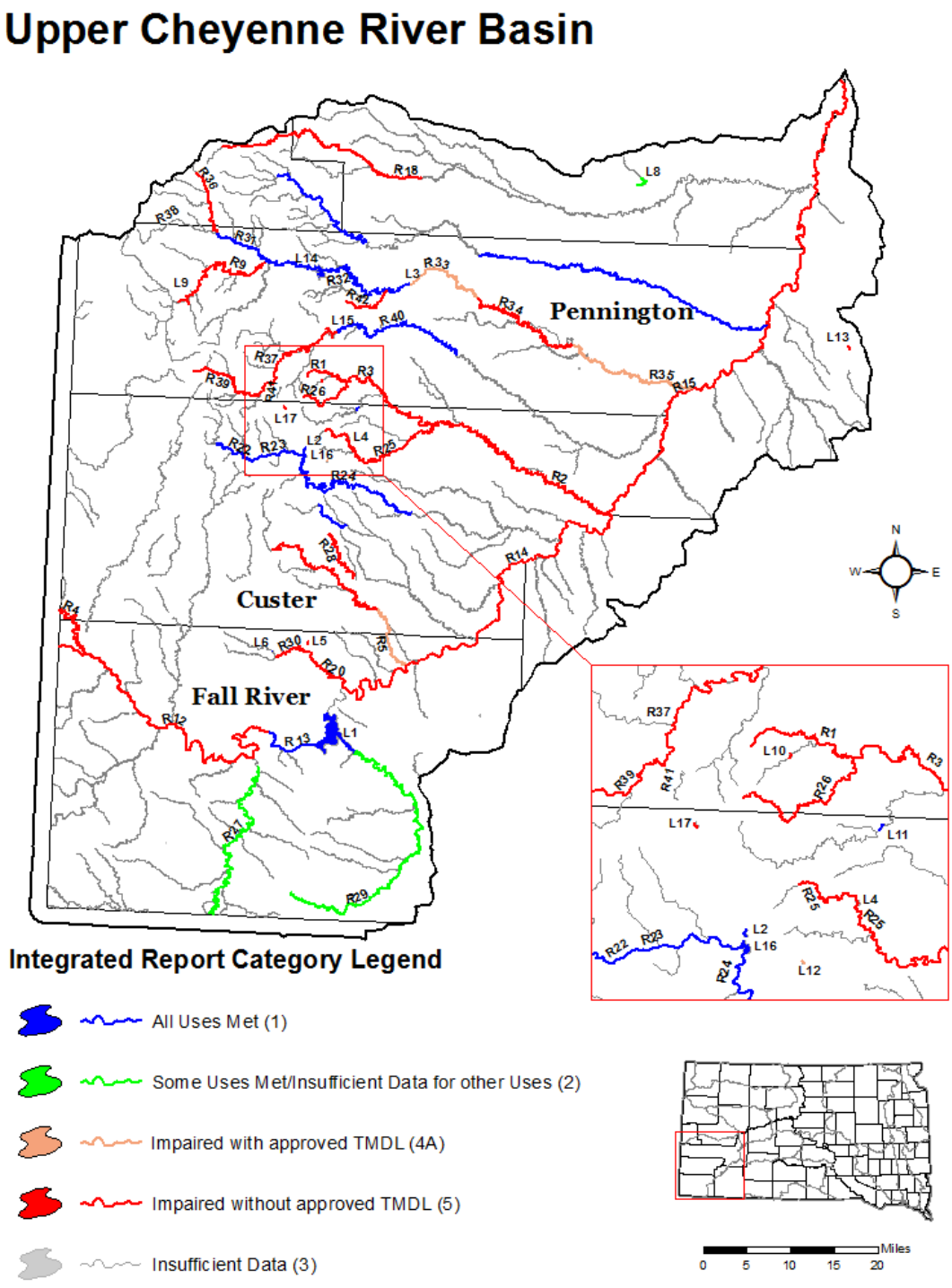


Figure 14: Upper Cheyenne River Basin

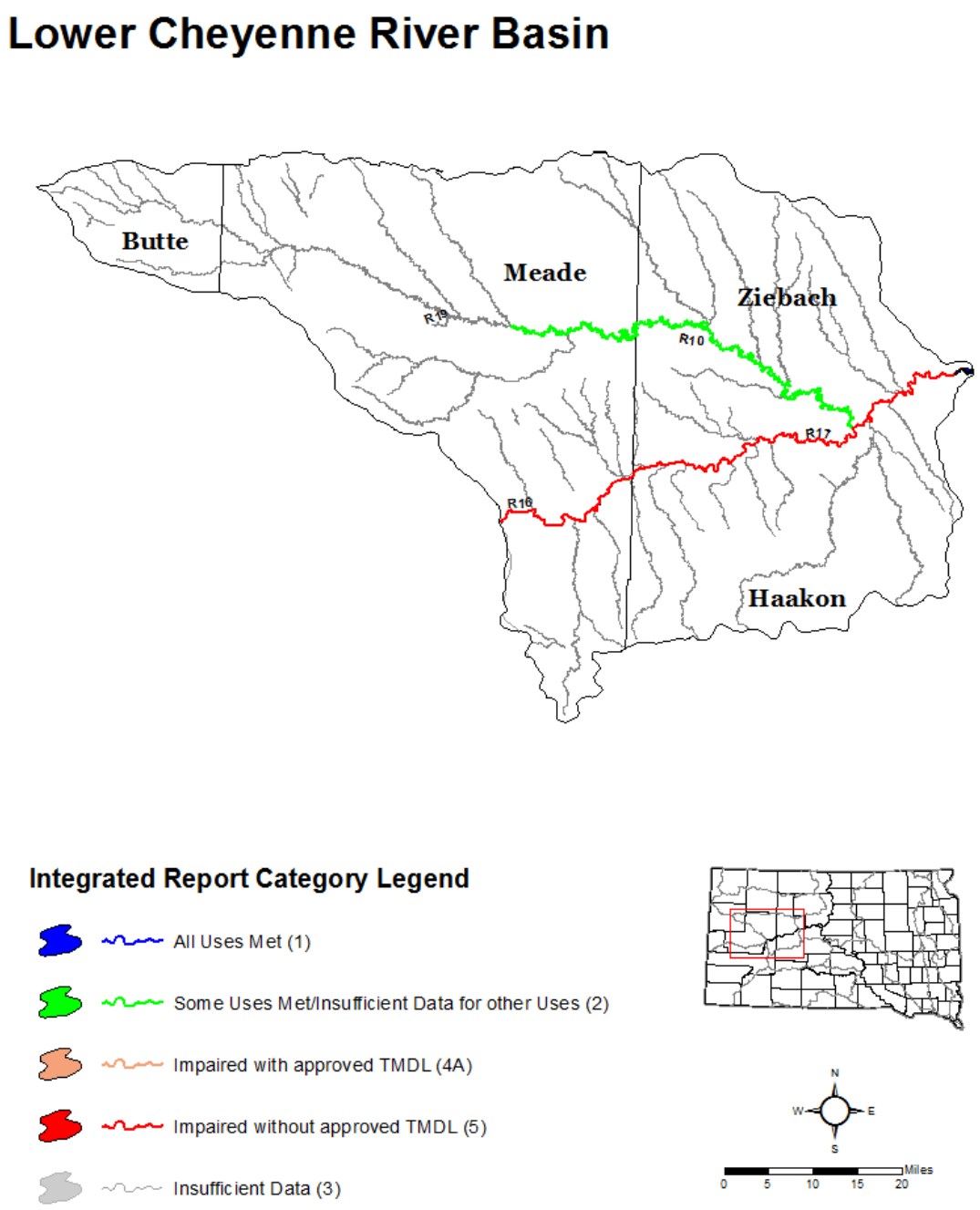


Figure 15: Lower Cheyenne River Basin

Grand River Basin (Figure 16, Table 35)

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 provided data for the Grand River and the North and South Fork Grand Rivers. 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, 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 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.

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

DENR continues discussions with EPA to determine next steps regarding TMDL development and prioritization for the Grand River Basin, since these waters are affected by unique jurisdictional issues. Therefore, TMDL priority and schedule have not been populated in the basin table or Appendix 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. D**- TMDL development in Discussions with EPA.

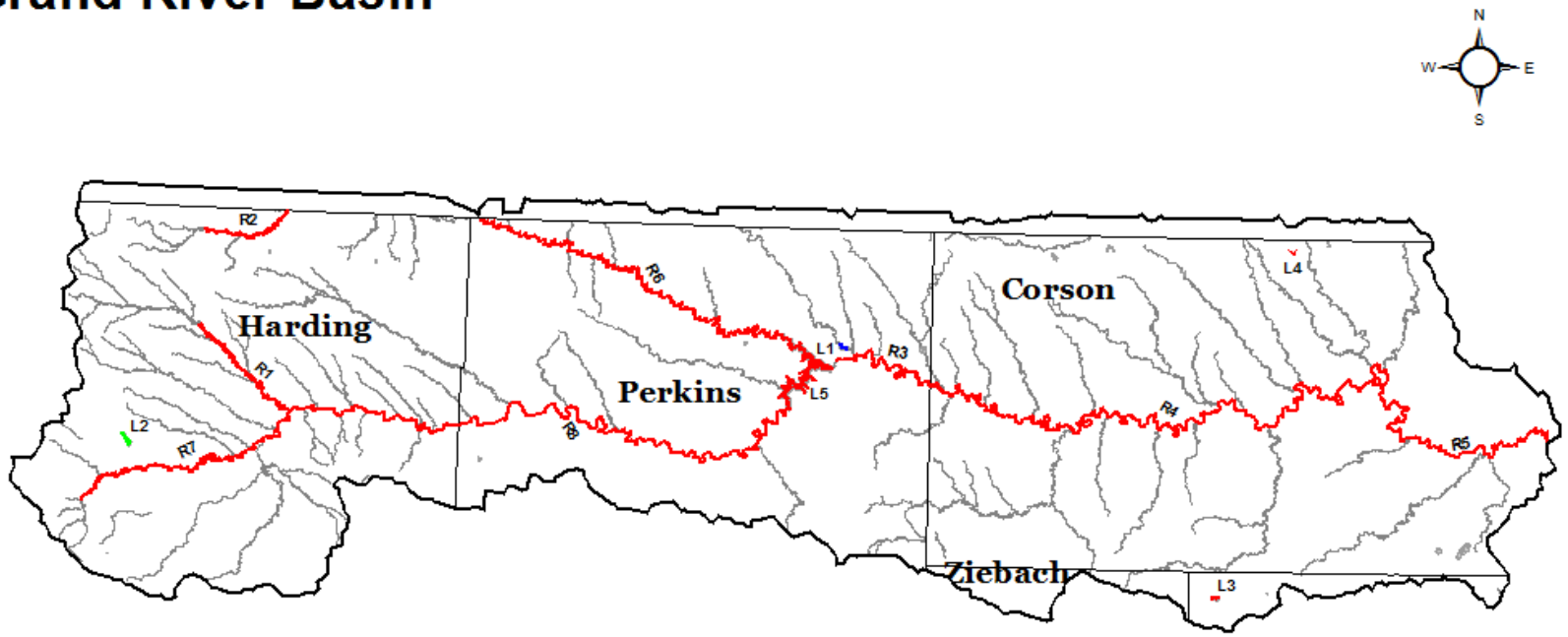
Table 35: Grand River Basin Information

WATERBODY Lakes/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 (SAR) 	 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 (SAR)	 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 NON INS FULL	 Salinity (SAR) Specific Conductance 	 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, water Salinity (SAR) 	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. D**- TMDL development in Discussions with EPA.

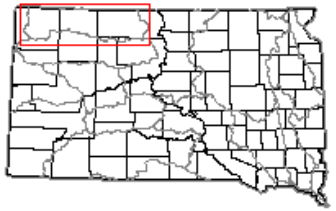
WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Grand River SD-GR-R-GRAND_02	Corson County line to Bullhead	R4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - D**
				Irrigation Waters	FULL-TH	Salinity (SAR)	Natural Sources		
				Limited Contact Recreation	NON	Escherichia coli			
				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				
				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 (SAR)	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 (SAR)	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 (SAR)	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



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)



Miles
0 10 20 30 40

Figure 16: Grand River Basin

James River Basin (Figures 17 and 18, Table 36)

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 38 lakes and maintains 21 water quality monitoring sites within the James River 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, 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.

Segments SD-JA-R-FOSTER_TRIB_01_USGS, SD-JA-R-HOWARD_TRIB_01_USGS, SD-JA-R-PREACHERS_RUN_TRIB_01_USGS, and SD-JA-R-ROCK_01_USGS are reaches that have been removed from this 2014 Integrated Report. These reaches are monitored by USGS but sufficient data is no longer being collected to make waterbody support determinations due to no flow conditions and reduced sampling. These reaches have all had insufficient data since the 2008 IR cycle. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

Loyalton Dam (SD-JA-L-LOYALTON_01) was removed from this 2014 Integrated Report. The county roadway that forms the dam grade was breached in 2012. GFP repaired the roadway and installed a low elevation open flow drainage culvert. Due to the significant loss of volume and depth, GFP no longer manages the waterbody as a fishery, and now manages the waterbody as a Game Production Area.

Dissolved oxygen (DO), 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.

Firesteel Creek is listed as impaired for failing to meet DENR's nutrient-related narrative standards. Average total phosphorus exceeded DENR's threshold. Fish and invertebrate IBIs were calculated for Firesteel Creek and both were below DENR's impairment

threshold. Wolf Creek (SD-JA-R-WOLF_01 and SD-JA-R-WOLF_02 – near Bridgewater) had average total phosphorus and average total nitrogen that exceeded DENR's threshold. The upper segment (SD-JA-R-WOLF_01) does not have any fish or invertebrate IBIs or habitat scores available and has been placed in DENR's subcategory 2N so that scores will be obtained and support of the nutrient-related narrative standards may be determined. The lower segment of Wolf Creek (SD-JA-R-WOLF_02) had fish and invertebrate IBIs that were above DENR's impairment threshold and therefore fully supports the nutrient-related narrative standards. Wolf Creek's (SD-JA-R-WOLF_SP_01 northeast of Miller), average total phosphorus exceeded DENR's threshold. Fish and invertebrate IBIs and habitat scores were not available and the reach has been placed in DENR's subcategory 2N.

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. No assessment projects are currently ongoing in the James 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. D**- TMDL development in Discussions with EPA.

Table 36: 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

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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Clear Lake SD-JA-L-CLEAR_M_01	Marshall County (formerly SD-BS-L-CLEAR_M_01)	L9	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
Cottonwood Lake SD-JA-L-COTTONWOOD_01	Spink County	L10	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Marginal Fish Life	FULL				
Cottonwood Lake SD-JA-L-COTTONWOOD_M_01	Marshall County (formerly SD-BS-L-COTTONWOOD_01)	L11	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Cresbard Lake SD-JA-L-CRESBARD_01	Faulk County	L12	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a pH (high)			
Elm Lake SD-JA-L-ELM_01	Brown County	L13	DENR	Domestic Water Supply	FULL			5*	YES - 2
				Fish/Wildlife Prop, Rec, Stock	FULL-TH	Mercury in fish tissue			
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Lake Faulkton SD-JA-L-FAULKTON_01	Faulk County	L14	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a			
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	FULL			5	YES - 2
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Marginal Fish Life	NON	pH (high)			
Lake Hanson SD-JA-L-HANSON_01	Hanson County	L16	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1*	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Henry Reservoir SD-JA-L-HENRY_01	Near Scotland, SD	L17	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent 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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Jail Pond SD-JA-L-JAIL_POND_01	Aurora County	L18	DENR	Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation Warmwater Marginal Fish Life	FULL INS INS FULL			2	NO
Jones Lake SD-JA-L-JONES_01	Hand County	L19	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 SD-JA-L-LATHAM_01	Faulk County	L20	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	L21	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 pH (high)		5*	YES - 2
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 INS INS 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 NON FULL NON NON	 Chlorophyll-a Chlorophyll-a Chlorophyll-a 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

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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
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	FULL INS INS FULL			2	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, water		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
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	NA NA NA NA	 		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 NON NON NON	 Chlorophyll-a Chlorophyll-a Chlorophyll-a		5	YES - 2
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 NON	 Temperature, water		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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
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	FULL			5	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Oxygen, Dissolved			
Twin Lakes SD-JA-L-TWIN_01	Sanborn County	L37	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	NON	Chlorophyll-a	Source Unknown		
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a			
Twin Lakes SD-JA-L-TWIN_02	Spink County	L38	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Wilmarth Lake SD-JA-L-WILMARTH_01	Aurora County	L39	DENR	Fish/Wildlife Prop, Rec, Stock	INS			5	YES - 2
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Permanent Fish Life	NON	pH (high)			
Wylie Lake SD-JA-L-WYLIE_01	Brown County	L40	DENR	Fish/Wildlife Prop, Rec, Stock	NA			3	NO
				Immersion Recreation	NA				
				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	NA				

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	INS				
Elm River SD-JA-R-ELM_01	Elm Lake to mouth	R2	DENR USGS	Domestic Water Supply	FULL			1	NO
				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 USGS	Domestic Water Supply	FULL			5*	YES - 1
				Fish/Wildlife Prop, Rec, Stock	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	INS-TH	Escherichia coli			
				Warmwater Permanent Fish Life	NON	Cause Unknown (narrative standard)			

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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Foot Creek SD-JA-R-FOOT_01_USGS	Near Aberdeen, SD	R4	DENR USGS	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
James River SD-JA-R-JAMES_01	North Dakota border to Mud Lake Reservoir	R5	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
James River SD-JA-R-JAMES_02	Mud Lake Reservoir	R6	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL	 		1	NO
James River SD-JA-R-JAMES_03	Columbia Road R7 Reservoir	R7	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Oxygen, Dissolved		5	YES - 2
James River SD-JA-R-JAMES_04	Columbia Road Reservoir to near US HWY 12	R8	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL NON	 Oxygen, Dissolved		5	YES - 2
James River SD-JA-R-JAMES_05	US HWY 12 to Mud Creek	R9	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 - 2
James River SD-JA-R-JAMES_06	Mud Creek to James River Diversion Dam	R10	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 - 2
James River SD-JA-R-JAMES_07	James River Diversion Dam to Huron 3rd Street Dam	R11	DENR	Domestic Water Supply Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	NON FULL FULL NON NON	Total Dissolved Solids Oxygen, Dissolved 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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
James River SD-JA-R-JAMES_08	Huron 3rd Street Dam To Sand Creek	R12	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL-TH	 Total Suspended Solids		5	YES - 1
James River SD-JA-R-JAMES_09	Sand Creek to I-90	R13	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	R14	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL-TH	 Total Suspended Solids		5	YES - 1
James River SD-JA-R-JAMES_11	Yankton County line to Mouth	R15	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	R16	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	R17	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 - 2
Mud Creek SD-JA-R-MUD_01	James River to Hwy 37	R18	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 - 2
Pierre Creek SD-JA-R-PIERRE_01	James River to S11, T102N, R58W	R19	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	INS INS INS-TH INS	 Escherichia coli Fecal Coliform 	 Livestock (Grazing or Feeding Operations)	4A*	NO
Snake Creek SD-JA-R-SNAKE_01	James River to confluence with SF Snake Creek	R20	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

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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Stony Run Creek SD-JA-R-STONYRUN_01_H	headwaters to Stony Run Lake	R21		Fish/Wildlife Prop, Rec, Stock Irrigation Waters	NA NA			3	NO
Turtle Creek SD-JA-R-TURTLE_01	James River to S17, T113N, R65W	R22	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			5	YES - 2
				Limited Contact Recreation Warmwater Marginal Fish Life	NON NON	Oxygen, Dissolved Oxygen, Dissolved			
Wolf Creek SD-JA-R-WOLF_01	Wolf Creek Colony to S5,T103N, R56W	R23	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			5	YES - 1
				Limited Contact Recreation Warmwater Marginal Fish Life	NON FULL	Escherichia coli			
Wolf Creek SD-JA-R-WOLF_02	Just above Wolf Creek Colony to the mouth.	R24	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
				Irrigation Waters Limited Contact Recreation	FULL NON	 Escherichia coli Fecal Coliform			
				Warmwater Marginal Fish Life	FULL				
Wolf Creek SD-JA-R-WOLF_SP_01	Turtle Creek to S10, T114N, R66W	R25	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			1	NO
				Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL				

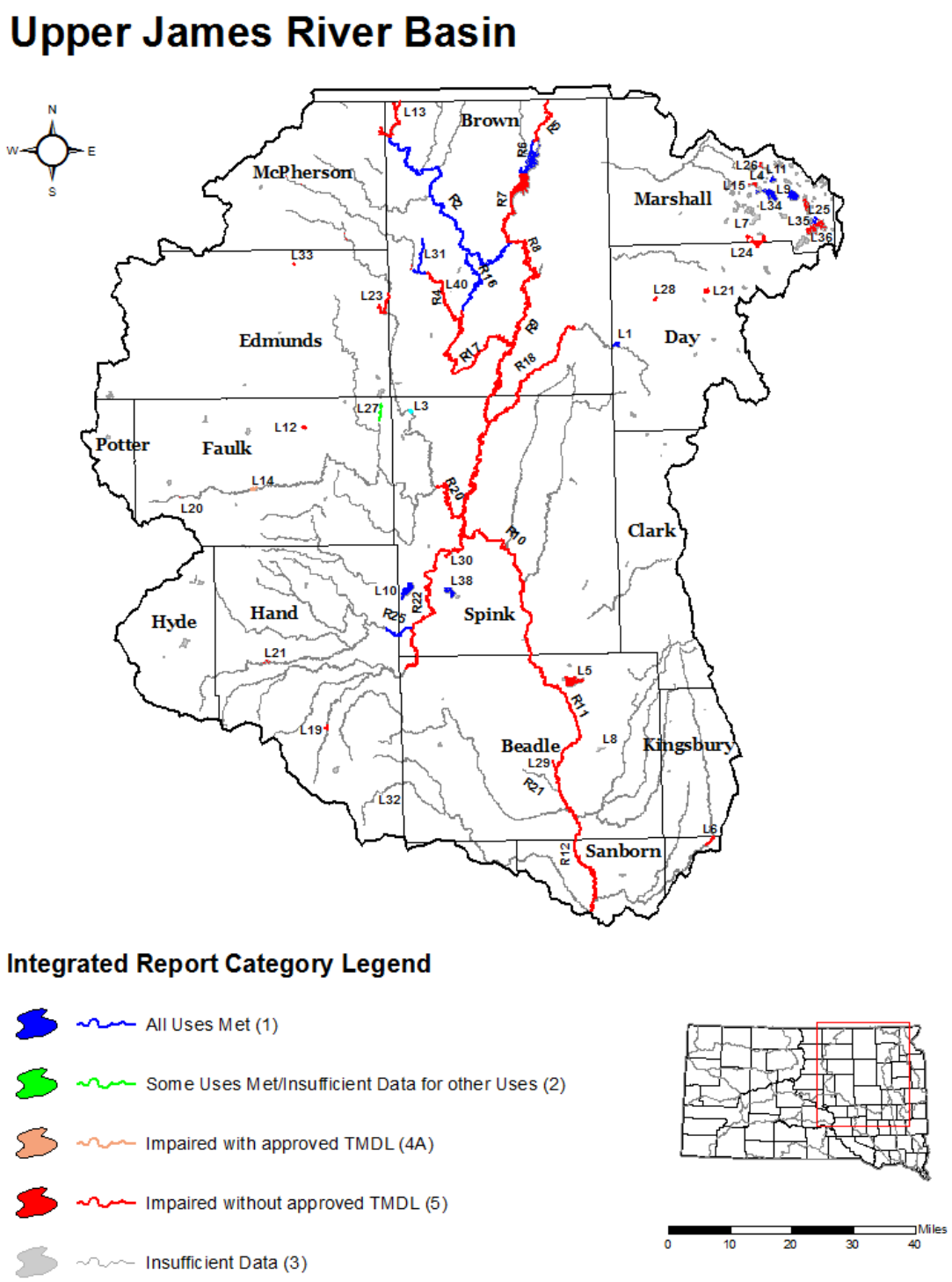


Figure 17: Upper James River Basin

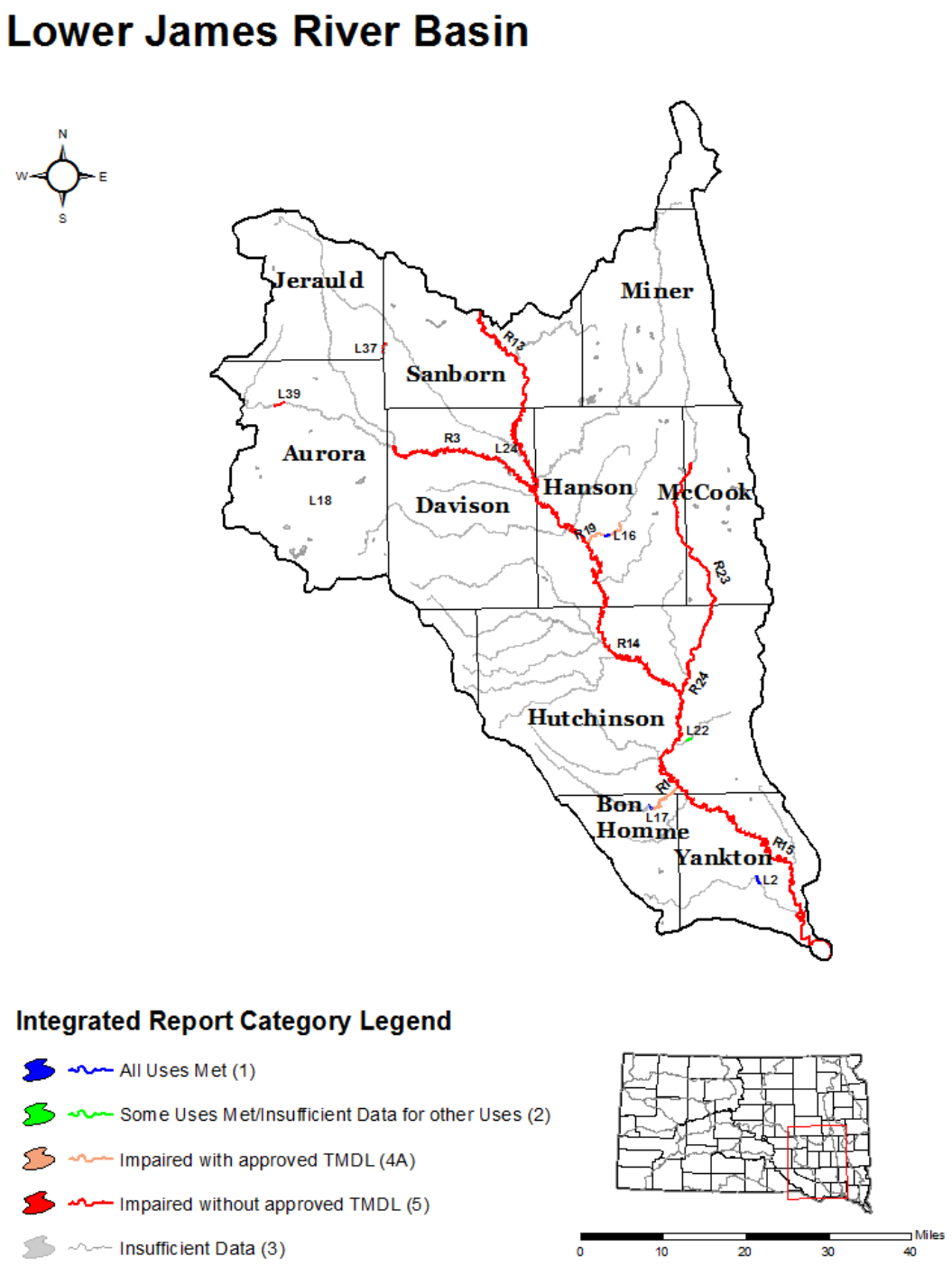


Figure 18: Lower James River Basin

Little Missouri River Basin (Figure 19, Table 37)

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. D**- TMDL development in Discussions with EPA.

Table 37: 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	Montana border to North Dakota border	R1	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL			5	YES - 1
SD-LM-R-LITTLE_MISSOURI_01				Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON	 Total Suspended Solids			

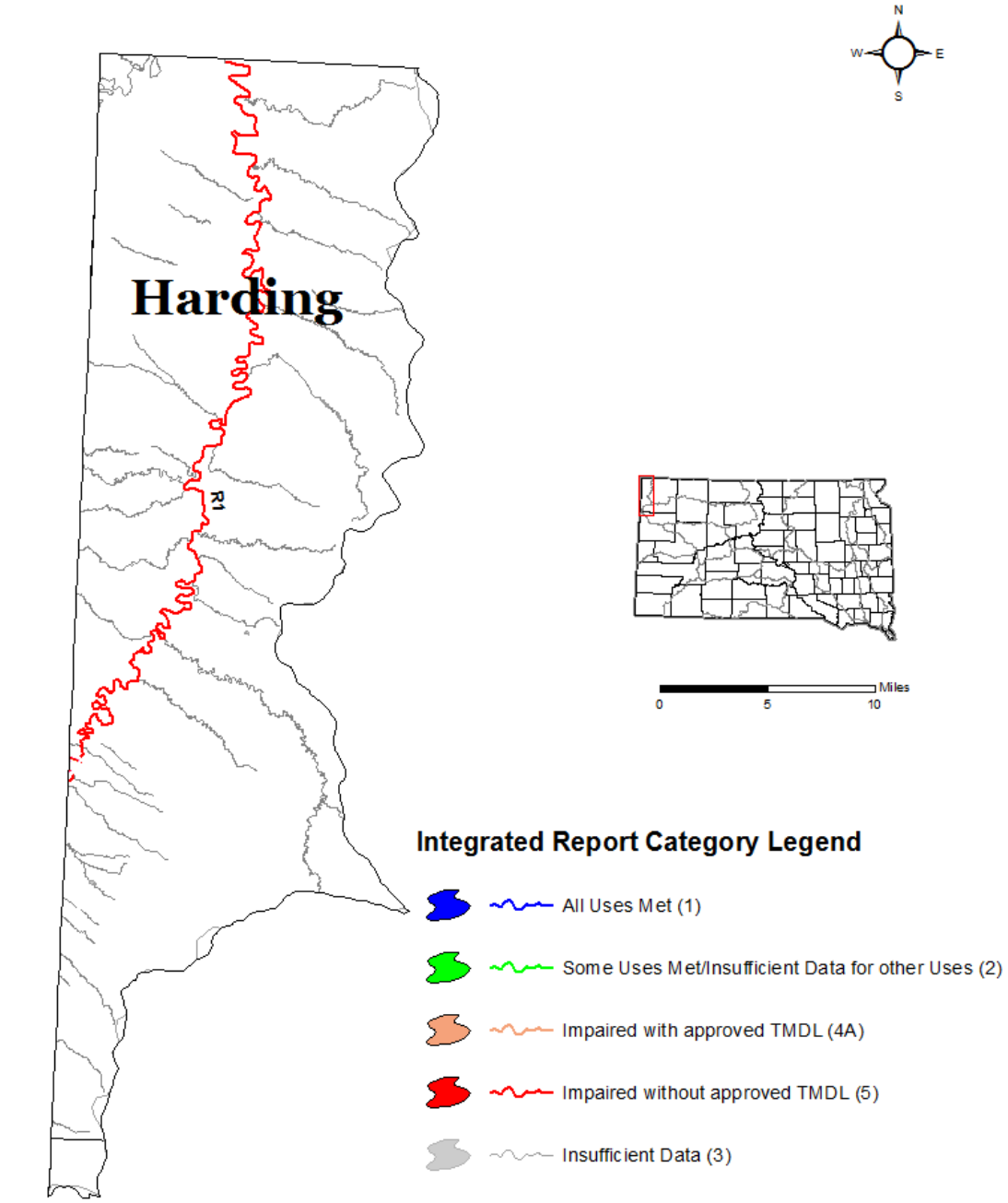


Figure 19: Little Missouri River Basin

Minnesota River Basin (Figure 20, Table 38)

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.

DENR has maintained a water quality monitoring site (460710) on the downstream portion of the Little Minnesota River since 1968. In previous IR cycles, this monitoring site was associated with the assessment unit SD-MN-R-LITTLE_MINNESOTA_01. In April 2010, DENR established an additional monitoring site (460171) on the upper portion of the Little Minnesota River. For the 2012 IR, data from both monitoring stations were used to assess the entire reach. Low dissolved oxygen data from the new station resulted in a dissolved oxygen listing in 2012 for the Little Minnesota River. The reach had previously been fully supporting all designated uses. Review of site conditions and water quality data from both monitoring stations indicated that the river was different at each location. Therefore, for the 2014 IR, DENR split the Little Minnesota River into two reaches. The original reach (SD-MN-R-LITTLE_MINNESOTA_01) was again associated with the 460710 station. The new reach (SD-MN-R-LITTLE_MINNESOTA_02) was associated with the new upstream station. Because only water quality data from 460710 was used to assess the lower reach, SD-MN-R-LITTLE_MINNESOTA_01 is again fully supporting all designated uses and dissolved oxygen was delisted as a cause for;. Water quality data from station 460171 was used to assess SD-MN-R-LITTLE_MINNESOTA_02. This data indicate low dissolved oxygen and resulted in a dissolved oxygen listing for this new reach.

Segments SD-MN-R-BIG_COULEE_01_USGS and SD-MN-R-COBB_01_USGS are reaches that have been removed from this 2014 Integrated Report. These reaches are monitored by USGS but sufficient data is no longer being collected to make waterbody support determinations due to no flow conditions, reduced sampling, or discontinued sites. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

The upper reach of the South Fork Whetstone River (SD-MN-R-WHETSTONE_S_FORK_01) had an average total phosphorus value that exceeded DENR's threshold. A fish and invertebrate IBI were calculated. Both values are higher than DENR's impairment threshold and the reach is fully supporting DENR's nutrient-related narrative standards. The lower reach of the South Fork Whetstone River (SD-MN-R-WHETSTONE_S_FORK_02) exceeded DENR's thresholds for both average total phosphorus and average total nitrogen. While the fish IBI scored well, the invertebrate IBI was below DENR's threshold. This reach has been placed in DENR's subcategory 2N so that additional scores, including habitat, will be obtained and support of the nutrient-related narrative standards may be determined. The North Fork Yellowbank River, the upper reach of the Little Minnesota River, and the Whetstone River, all exceeded DENR's average total phosphorus threshold. None of these reaches have available fish or invertebrate IBIs or habitat scores and have been placed in DENR's subcategory 2N.

Implementation efforts are currently ongoing in the Upper Minnesota River basin in Grant and Roberts counties with focus on the Whetstone and Yellow Bank watersheds.

Coordination was included as part of the Northeast 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. D**- TMDL development in Discussions with EPA.

Table 38: 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, water		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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Lac Qui Parle River, West Branch SD-MN-R-LAC_QUI_PARLE_W_BR_01	SD/MN border to S8, T115N, R47W	R1	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 S24, T126N, R51W	R2	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Little Minnesota River SD-MN-R-LITTLE_MINNESOTA_02	S24, T126N, R51W to S15, T128N, R52W	R3	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 River toS22, T118N, R48W	R4	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 - 2
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	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

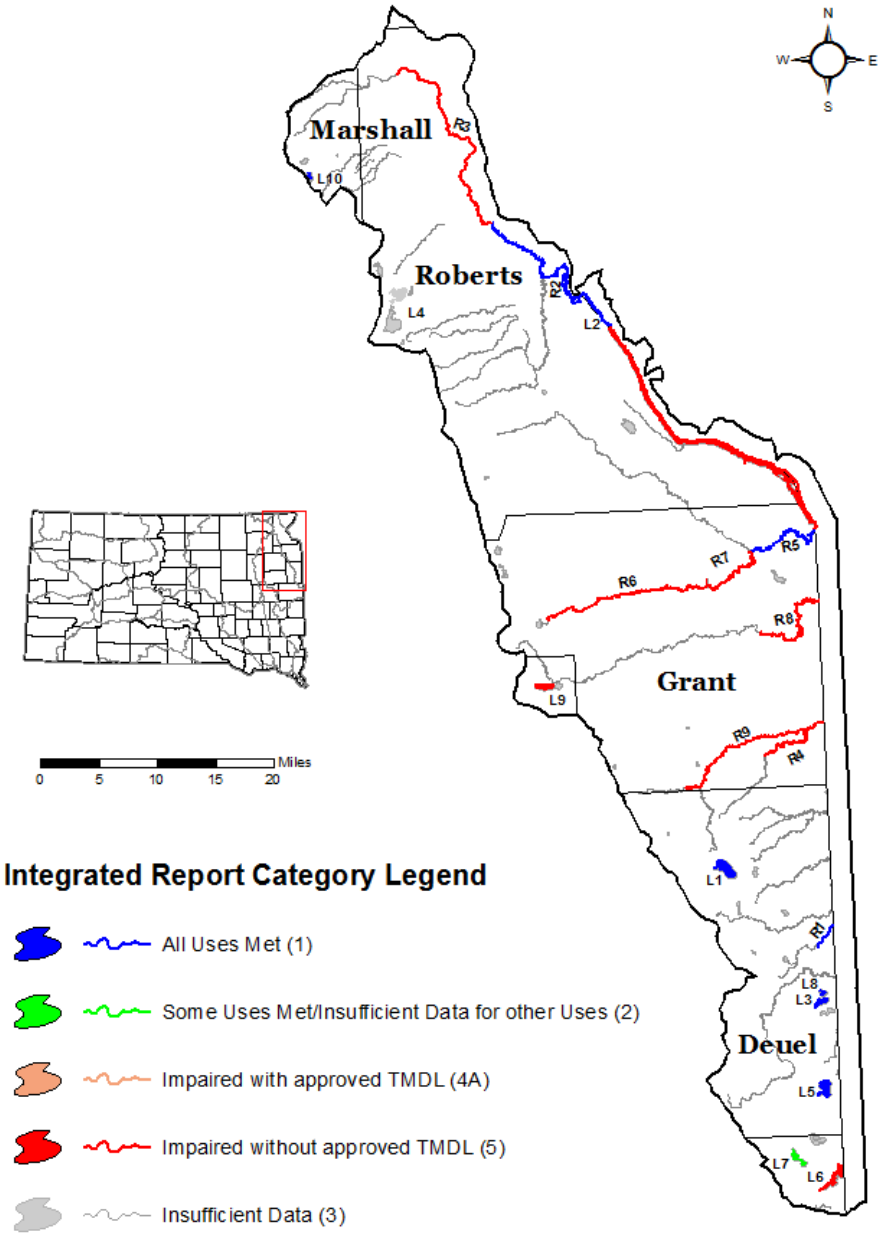


Figure 20: Minnesota River Basin

Missouri River Basin (Figures 21 and 22, Table 39)

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 covering 374,000 acres. 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 23 lakes and maintains ten water quality monitoring stations within the Missouri River basin. 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 2011 Report “Water Quality Conditions in the Missouri River Mainstem System” were also used in determining waterbody support on Lake Oahe and Lake Sharpe. Water quality data for Lewis and Clark Lake was provided by Nebraska Department of Environmental Quality (NE DEQ) and USACE.

Segments SD-MI-R-ANDES_01_USGS, SD-MI-R-EAST_FORK_PLATTE_01_USGS, SD-MI-R-ELM_01_USGS, and SD-MI-R-SNAKE_01_USGS are reaches that have been removed from this 2014 Integrated Report. These reaches are monitored by USGS but sufficient data is no longer being collected to make waterbody support determinations due to no flow conditions, reduced sampling, or discontinued sites. These reaches have all had insufficient data since the 2008 IR cycle. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

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).

In 2011, the Missouri River Reservoir System experienced unprecedented runoff and flood volume. To handle the record inflow, water was released from Oahe Dam through both the flood tunnels and the powerplant. The massive evacuation of water that occurred from May through September 2011 resulted in the temporary loss of coldwater habitat. Additionally, large losses of coldwater species occurred via entrainment through the dam. Although the coldwater habitat was restored soon after the cessation of water evacuation, the loss of species created a predator/prey biological imbalance that is still recovering. Based on an estimate from GFP, 80% of rainbow smelt were lost (R. Hanten, personal communication, 2014). Favorable environmental and physical conditions are necessary for successful rainbow smelt spawning to restore biological balance. Chinook salmon densities were also severely diminished. GFP is actively restocking Lake Oahe, with increased predation posing an additional challenge for salmon fry survival.

Most lakes in the Missouri River basin are highly eutrophic because of nutrient enrichment and siltation. Agricultural activities are the primary sources of pollution.

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. D**- TMDL development in Discussions with EPA.

Table 39: 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	FULL			5	YES - 2
				Immersion Recreation	NON	Oxygen, Dissolved			
				Limited Contact Recreation	NON	Oxygen, Dissolved			
				Warmwater Marginal Fish Life	NON	Oxygen, Dissolved			
Brakke Dam SD-MI-L-BRAKKE_01	Lyman County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a			
Burke Lake SD-MI-L-BURKE_01	Gregory County	L3	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a			
						Oxygen, Dissolved			
Byre Lake SD-MI-L-BYRE_01	Lyman County	L4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a			
Lake Campbell SD-MI-L-CAMPBELL_01	Campbell County	L5	DENR	Fish/Wildlife Prop, Rec, Stock	NON	pH (high)		5	YES - 2
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Semipermanent Fish Life	NON	pH (high)			
Corsica Lake SD-MI-L-CORSICA_01	Douglas County	L6	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Semipermanent Fish Life	NON	Chlorophyll-a			
Cottonwood Lake SD-MI-L-COTTONWOOD_01	Sully County	L7	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Semipermanent Fish Life	INS				
Dante Lake SD-MI-L-DANTE_01	Charles Mix County	L8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
				Immersion Recreation	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	NON	Oxygen, Dissolved			
						Temperature, water			
Eureka Lake SD-MI-L-EUREKA_01	McPherson County	L9	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Semipermanent Fish Life	FULL				
Fairfax Lake SD-MI-L-FAIRFAX_01	Gregory County	L10	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Immersion Recreation	INS				
				Limited Contact Recreation	INS				
				Warmwater Semipermanent 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. D**- TMDL development in Discussions with 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	 Chlorophyll-a Oxygen, Dissolved		4A*	NO
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	 Chlorophyll-a Oxygen, Dissolved Chlorophyll-a Oxygen, Dissolved Chlorophyll-a 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 - 2
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, water		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

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. D**- TMDL development in Discussions with EPA.

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
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
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**
Campbell Creek SD-MI-R-CAMPBELL_01_USGS	Near Lee's Corner	R1	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	R2	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	R3	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL FULL			1	NO
Emanuel Creek SD-MI-R-EMANUEL_01	Lewis and Clark Lake toS20, T94N, R60W	R4	DENR USGS	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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/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	R5	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	R6	DENR USGS USACE NEDEQ	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	R7	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			
Medicine Knoll Creek SD-MI-R-MEDICINE_KNOLL_01	Lake Sharpe to confluence with its north and south forks	R8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	INS				
				Warmwater Marginal Fish Life	FULL				
Missouri River (Lake Oahe) SD-MI-R-OAHE_01	North Dakota border to Oahe Dam	R9	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	R10	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	INS				
Platte Creek SD-MI-R-PLATTE_01_USGS	Near Platte, SD	R11	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/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	R12	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	R13	DENR USGS USACE	Coldwater Permanent Fish Life	NON	Temperature, water		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	R14	DENR	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
Spring Creek SD-MI-R-SPRING_01	Lake Pocasse to US HWY 83	R15	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

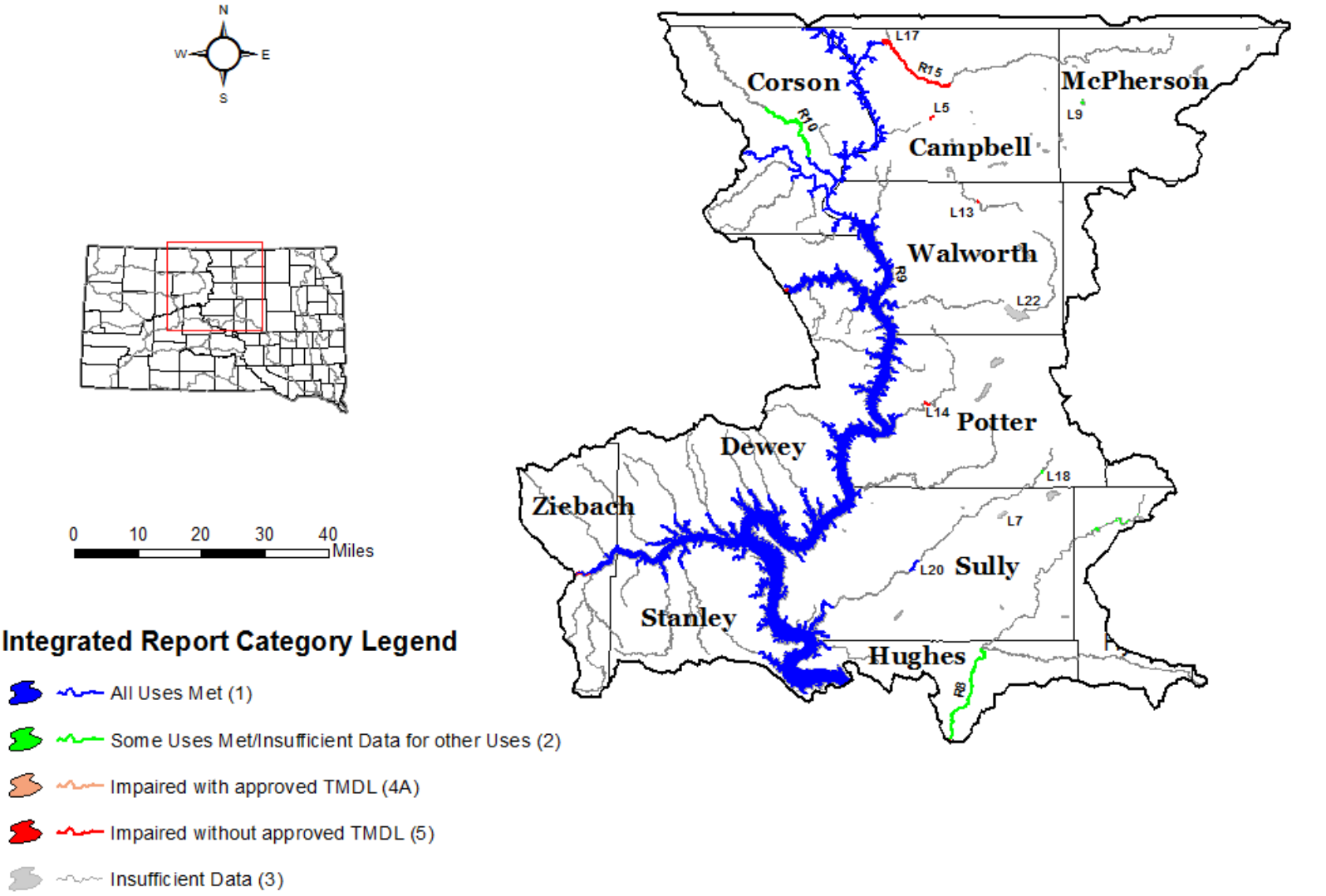


Figure 21: Upper Missouri River Basin

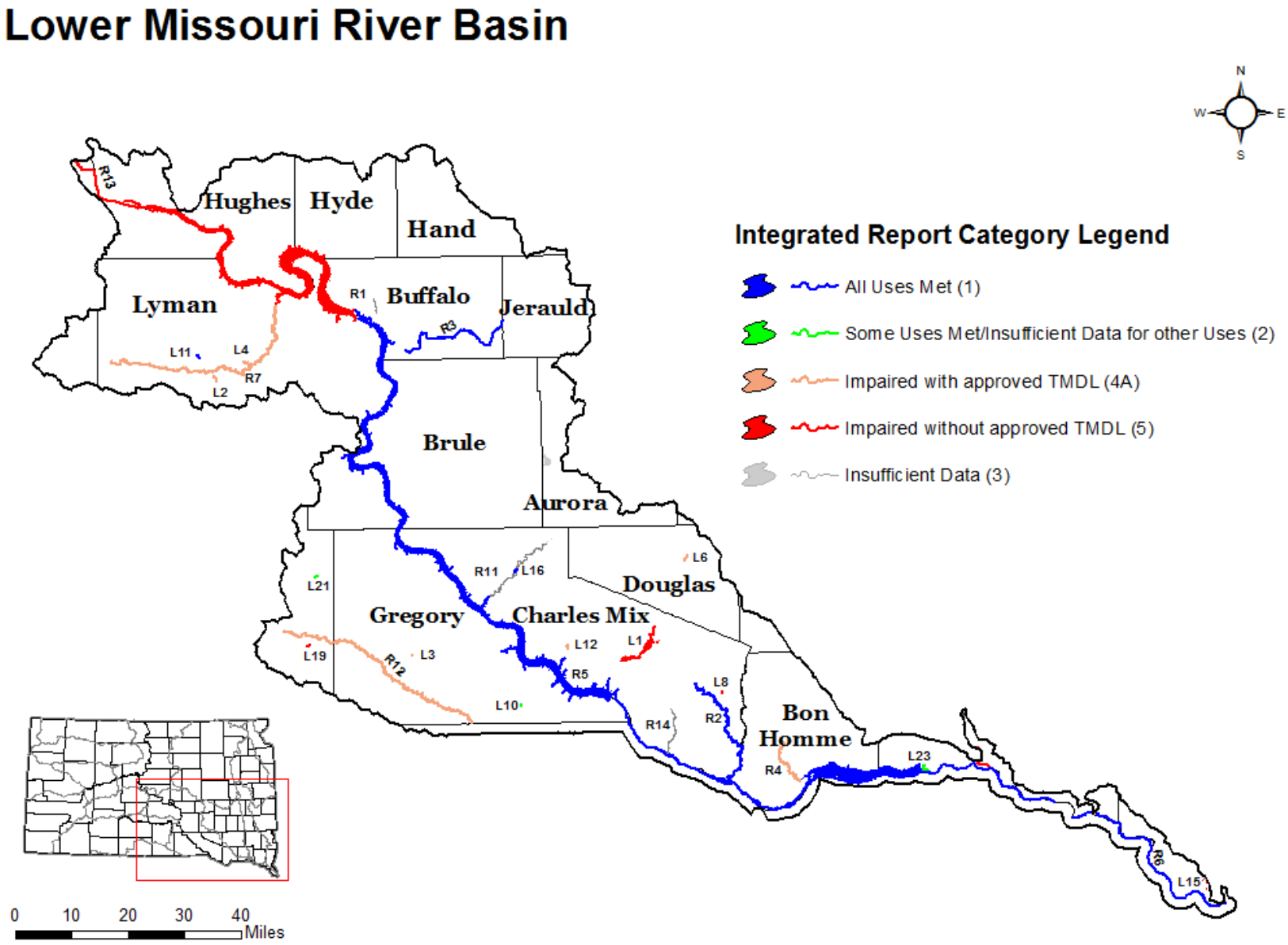


Figure 22: Lower Missouri River Basin

Moreau River Basin (Figure 23, Table 40)

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 total dissolved solids in the water of local streams, primarily sulfate, iron, manganese, sodium, and other minerals. Other pollutants in the basin include TSS, SAR, and specific conductance due to natural conditions; and fecal coliform and *E. coli* bacteria.

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 continues discussions with EPA to determine next steps regarding TMDL development and prioritization for the Moreau River Basin, since these waters are affected by unique jurisdictional issues. Therefore, TMDL priority and schedule have not been populated in the basin table or Appendix 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. D**- TMDL development in Discussions with EPA.

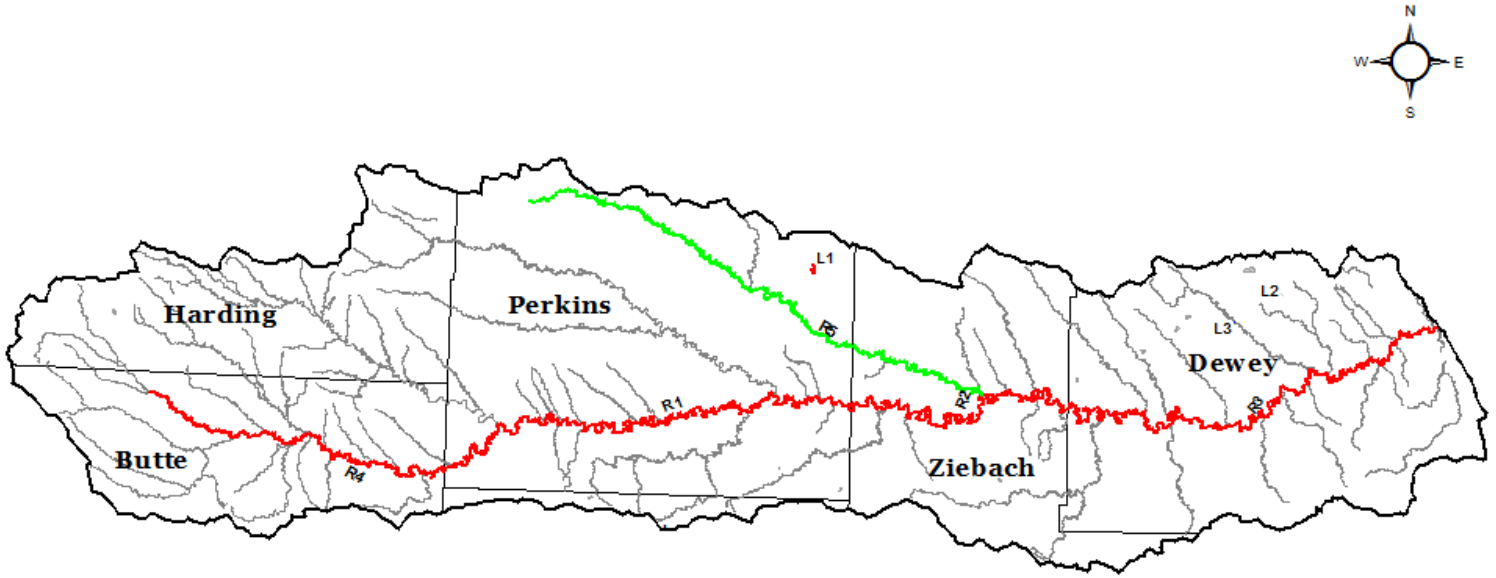
Table 40: Moreau River Basin Information

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	NON	Salinity (SAR)	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 (SAR)	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	NON	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	Specific Conductance Total Dissolved Solids		5	YES - D**
				Irrigation Waters	NON	Salinity (SAR) Specific Conductance	Natural Sources		
				Limited Contact Recreation	FULL				
				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. D**- TMDL development in Discussions with EPA.

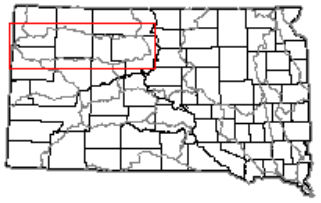
WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Thunder Butte Creek SD-MU-R-THUNDER_BUTTE_01	Headwaters to mouth	R5	DENR	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Marginal Fish Life	FULL FULL INS FULL			2	NO

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)



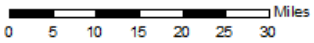


Figure 23: Moreau River Basin

Niobrara River Basin (Figure 24, Table 41)

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 maintains a monitoring site on Antelope Creek.

Segment SD-NI-R-SAND_01_USGS is a reach that has been removed from this 2014 Integrated Report. This reach is monitored by USGS but sufficient data is no longer being collected to make waterbody support determinations due to no flow conditions or reduced sampling. This reach has had insufficient data since the 2010 IR cycle. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

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 fully supporting all designated uses but is still considered “threatened” due to exceedances of fecal coliform and *E. coli* bacteria. Land use along the Keya Paha River is primarily agriculture. Livestock grazing in the riparian or shoreline areas 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.

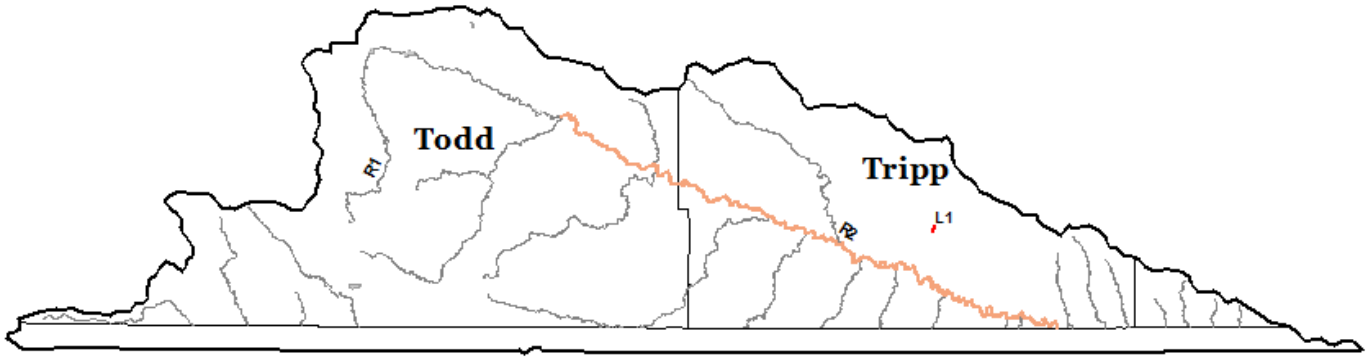
A portion of the Lewis and Clark Project (Missouri River Basin) is located in the Niobrara basin and is in the implementation phase.

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. D**- TMDL development in Discussions with EPA.

Table 41: Niobrara River Basin Information

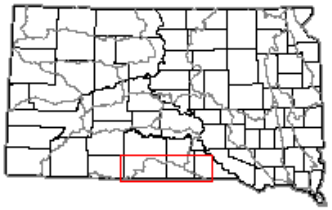
WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Rahn Lake SD-NI-L-RAHN_01	Tripp County	L1	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
				Immersion Recreation	NON	Chlorophyll-a	Source Unknown		
				Limited Contact Recreation	NON	Chlorophyll-a			
				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	INS			3	NO
				Irrigation Waters	INS				
				Limited Contact Recreation	NA				
				Warmwater Semipermanent Fish Life	INS				
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	Grazing in Riparian or Shoreline Zones		
						Fecal Coliform			
				Warmwater Semipermanent Fish Life	FULL				

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)



Miles
0 5 10 15 20 25 30

Figure 24: Niobrara River Basin

Red River Basin (Figure 25, Table 42)

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. For this reason, segment SD-RD-R-LA_BELLE_01_USGS has been removed from this 2014 Integrated Report. This reach has had insufficient data since the 2010 IR cycle. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

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. D**- TMDL development in Discussions with EPA.

Table 42: 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	FULL			1	NO
				Immersion Recreation	FULL				
				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Permanent Fish Life	FULL				
White Lake SD-RD-L-WHITE_01	Marshall County	L2	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a			

Red River Basin

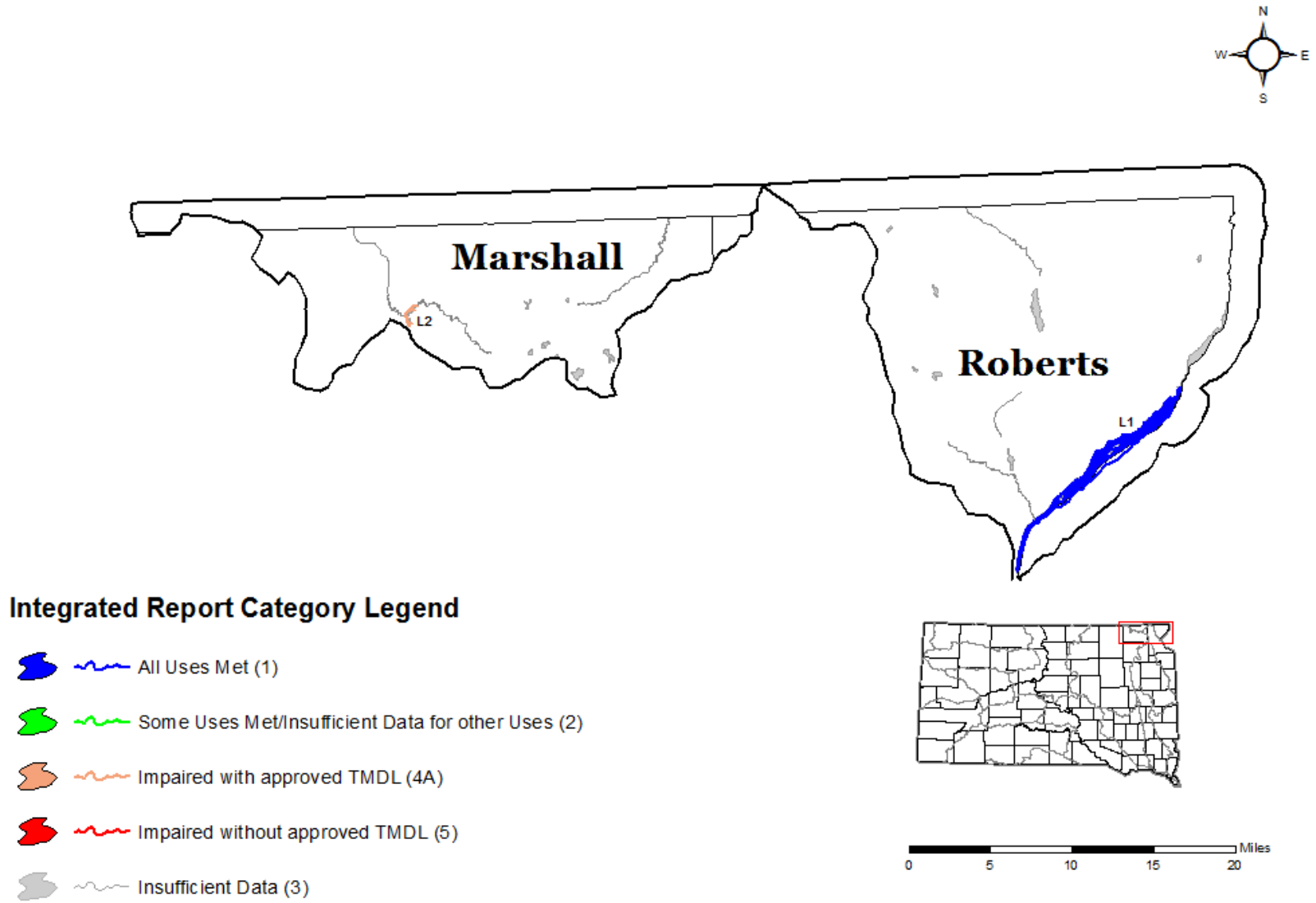


Figure 25: Red River Basin

Vermillion River Basin (Figure 26, Table 43)

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.

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 East Fork Vermillion River was assessed for DENR's nutrient-related narrative standards. For the lower segment (SD-VM-R-VERMILLION_E_FORK_02), average total phosphorus exceeded DENR's threshold. Fish and invertebrate IBIs were calculated and both scores were above DENR's impairment threshold. For the upper segment (SD-VM-R-VERMILLION_E_FORK_01), average total phosphorus exceeded DENR's threshold. Fish and invertebrate IBIs and habitat scores were not available resulting in this upper segment being placed in DENR's subcategory 2N.

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. D**- TMDL development in Discussions with EPA.

Table 43: 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, water			
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			5	YES - 2
				Immersion Recreation	NON	Chlorophyll-a			
				Limited Contact Recreation	NON	Chlorophyll-a			
				Warmwater Permanent Fish Life	NON	Chlorophyll-a			
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	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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Long Creek	Vermillion River to Highway 44	R3	DENR	Fish/Wildlife Prop, Rec, Stock	INS			5	YES - 1
SD-VM-R-LONG_01				Irrigation Waters	INS				
				Limited Contact Recreation	INS-TH	Escherichia coli			
						Fecal Coliform	Livestock (Grazing or Feeding Operations)		
				Warmwater Semipermanent Fish Life	INS				
Vermillion River	Headwaters to Turkey Ridge Creek	R4	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			1	NO
SD-VM-R-VERMILLION_01				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	FULL				
Vermillion River	Turkey Ridge Creek to Baptist Creek	R5	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-VM-R-VERMILLION_02				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL				
				Warmwater Semipermanent Fish Life	NON	Total Suspended Solids			
Vermillion River	Baptist Creek to mouth	R6	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5*	YES - 2
SD-VM-R-VERMILLION_03				Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
				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	McCook/Lake County Line to Little Vermillion River	R7	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			4A*	NO
SD-VM-R-VERMILLION_E_FORK_01				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL-TH	Fecal Coliform			
				Warmwater Marginal Fish Life	FULL				
East Fork Vermillion River	Little Vermillion River To mouth	R8	DENR USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
SD-VM-R-VERMILLION_E_FORK_02				Irrigation Waters	FULL				
				Limited Contact Recreation	FULL-TH	Escherichia coli			
				Warmwater Marginal Fish Life	FULL				
West Fork Vermillion River	Vermillion River to McCook-Miner County	R9	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 1
SD-VM-R-VERMILLION_WEST_FORK_01_USGS	Line			Irrigation Waters	FULL				
				Limited Contact Recreation	INS-TH	Escherichia coli			
						Fecal Coliform			
				Warmwater Marginal Fish Life	INS				

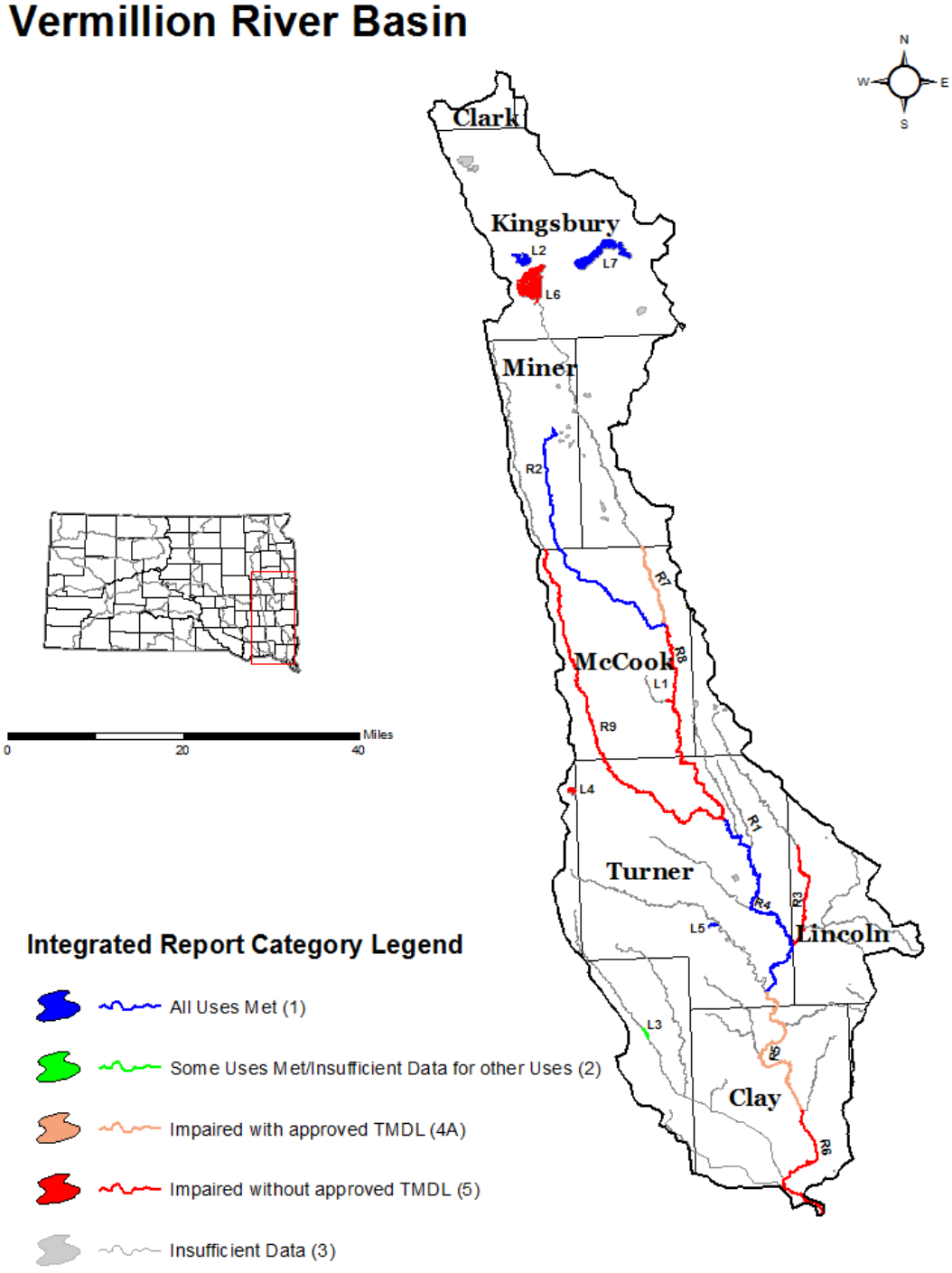


Figure 26: Vermillion River Basin

White River Basin (Figure 27, Table 44)

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 has assessed one lake in the White River basin and 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 and others. The data are limited, and the only parameters that were measured were specific conductance and water temperature. Segments SD-WH-R-OMAHA_01_USGS, SD-WH-R-ROSEBUD_01_USGS, SD-WH-R-SAWIMLL_CANYON_01_USGS, and SD-WH-R-WIILLIAMS_01_USGS are reaches that have been removed from this 2014 Integrated Report. Other than Williams Creek, USGS has discontinued monitoring at these reaches and sufficient data is no longer being collected to make waterbody support determinations. These reaches have had insufficient data since the 2010 IR cycle. Williams Creek is occasionally monitored by USGS; however due to chronic low flow or dry conditions, there is not sufficient data to make a support determination. Williams Creek has had insufficient data since the 2010 IR cycle. DENR will add waterbody reaches to future reports if routine monitoring data becomes available or is supplied by other organizations.

DENR continues to sample uranium, and other parameters 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 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. D**- TMDL development in Discussions with EPA.

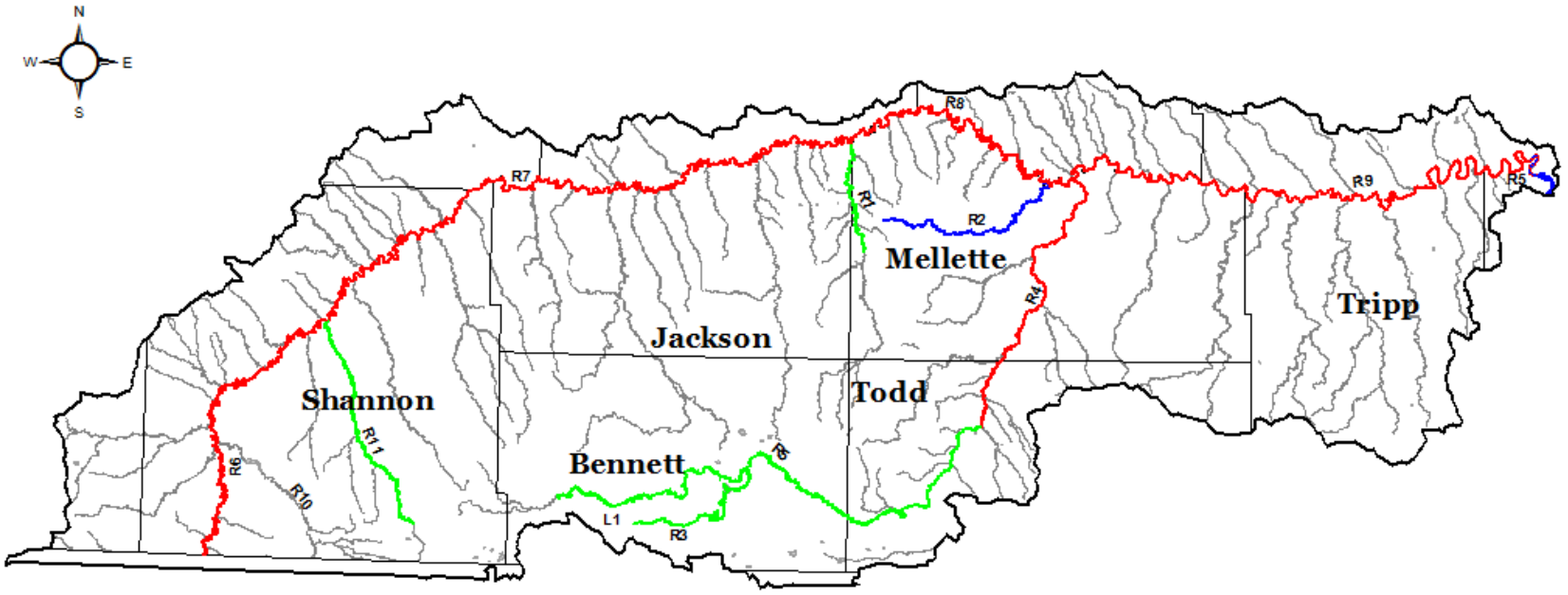
Table 44: White River Basin Information

WATERBODY Lakes/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
Allan Dam SD-WH-L-ALLAN_DAM_01	Bennett County	L1	DENR	Coldwater Marginal Fish Life Fish/Wildlife Prop, Rec, Stock Immersion Recreation Limited Contact Recreation	NON FULL INS INS	pH (high)		5	YES - 2
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 INS			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 Limited Contact Recreation Warmwater Permanent Fish Life	FULL FULL NA INS			2	NO
Little White River SD-WH-R-LITTLE_WHITE_01	Rosebud Creek to mouth	R4	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 - 2
Little White River SD-WH-R-LITTLE_WHITE_02_USGS	S6, T36N, R39W to Rosebud Creek	R5	USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL INS NA FULL			2	NO
White River SD-WH-R-WHITE_01	NE/SD border to Willow Creek	R6	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL FULL FULL-TH FULL	Escherichia coli Fecal Coliform		5	YES - 2
White River SD-WH-R-WHITE_02	Willow Creek to Pass Creek	R7	DENR USGS	Fish/Wildlife Prop, Rec, Stock Irrigation Waters Limited Contact Recreation Warmwater Semipermanent Fish Life	FULL NON NON FULL	Salinity (SAR) Escherichia coli Fecal Coliform	Wildlife Other than Waterfowl Livestock (Grazing or Feeding Operations)	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. D**- TMDL development in Discussions with EPA.

WATERBODY Streams/AUID	LOCATION	MAP ID	BASIS	USE	SUPPORT	CAUSE	SOURCE	EPA Category	ON 303(d) & Priority
White River	Pass Creek to Little White River	R8	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
			USGS	Irrigation Waters	NON	Salinity (SAR)			
SD-WH-R-WHITE_03				Limited Contact Recreation	NON	Escherichia coli Fecal Coliform			
				Warmwater Semipermanent Fish Life	FULL				
White River	Little White River to confluence with Missouri River	R9	DENR	Fish/Wildlife Prop, Rec, Stock	FULL			5	YES - 2
			USGS	Irrigation Waters	FULL				
				Limited Contact Recreation	NON	Escherichia coli			
SD-WH-R-WHITE_04						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	White Clay Lake to Oglala Lake	R10	USGS	Fish/Wildlife Prop, Rec, Stock	INS			3	NO
				Irrigation Waters	INS				
SD-WH-R-WHITECLAY_01_USGS				Limited Contact Recreation	NA				
				Warmwater Permanent Fish Life	INS				
Wounded Knee Creek	Spring Creek to White River	R11	USGS	Fish/Wildlife Prop, Rec, Stock	FULL			2	NO
				Irrigation Waters	FULL				
SD-WH-R-WOUNDEDKNEE_01_USGS				Limited Contact Recreation	NA				
				Warmwater Marginal Fish Life	INS				

White 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)

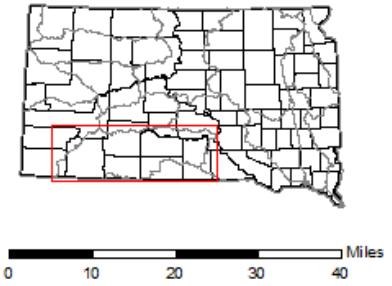


Figure 27: White River Basin

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 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. (1979), 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 continues to be 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 (Clean Water Act Section 307(a) toxic pollutants) are routinely monitored at several WQM stream sites located near historic or current mining activities in the northern Black Hills. Ammonia, a priority toxin, is routinely monitored throughout the DENR ambient monitoring network.

Table 45: Total Size Affected by Toxics

WATERBODY	SIZE MONITORED FOR TOXICS*	SIZE WITH ELEVATED LEVELS OF TOXICS**
Rivers (miles)	5,933	2
Lakes (acres)	135,689	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 21 separate aquatic life concern incidents investigated from October 1, 2011, to September 30, 2013. The majority of these kills occurred during the summer of 2012. During that time, extreme drought and high ambient air temperatures resulted in low water conditions and high water temperatures which caused stress and death to fish. The remaining fish kills occurred for unknown reasons.

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, 2011 to September 30, 2013, there were ten minor fish kills, eight moderate fish kills, and three severe 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. For this 2014 IR cycle, there were no waterbodies listed as impaired due to fish kills (Table 46).

Table 46: Summary of Fish Kill Investigations

Date	Waterbody	County	Species	Fish kill severity	Cause
4/26/2012	Union Creek	Union	Common Creek Chubs	minor	Unknown
5/15/2012	McCook Lake	Union	common carp	minor	Unknown
6/15/2012	Grass Lake	Minnehaha	walleye, perch	minor	Unknown - likely caused by high temperature or low dissolved oxygen
7/2/2012	Lake Mitchell (west end boat canal)	Davison	catfish, minnows	moderate	Summer kill due to excessive algal growth, low water volume, and low dissolved oxygen
7/3/2012	Roy Lake	Marshall	common carp	moderate	Unknown -likely due to spawning stress
7/3/2012	Clear Lake	Marshall	common carp	minor	Unknown -likely due to spawning stress
7/3/2012	Lake St. John	Hamlin	walleye, northern pike	moderate	Unknown - likely due to high water temperatures and low dissolved oxygen
7/5/2012	Elm River	Brown	all species	severe	Summer kill caused by high water temperatures, low water levels, and poor dissolved oxygen
7/5/2012	James River	Brown	all species	severe	Summer kill caused by high water temperatures, low water levels, and poor dissolved oxygen
7/5/2012	James River Sand Lake NWR	Brown	all species	severe	Summer kill caused by high water temperatures, low water levels, and poor dissolved oxygen
7/5/2012	Mary Lake	Hamlin	all species	moderate	Summer kill caused by high water temperatures, low water levels, and poor dissolved oxygen
7/5/2012	Lake Norden	Hamlin	all species	minor	Summer kill caused by high water temperatures, low water levels, and poor dissolved oxygen
7/5/2012	Lake Cochrane	Deuel	panfish	minor	Summer kill likely caused by high water temperatures, low water levels, and poor dissolved oxygen
7/16/2012	Lake Waggoner	Haakon	bluegill	moderate	Unknown - likely due to high water temperatures or low dissolved oxygen
7/16/2012	James River (south of Huron)	Beadle	northern pike	minor	Unknown - likely due to high water temperatures or low dissolved oxygen
7/23/2012	Lake Madison	Lake	black bullhead, walleye, yellow perch, white crappie, white sucker	minor	Summer kill

Date	Waterbody	County	Species	Fish kill severity	Cause
7/24/2012	Whitewood Lake	Kingsbury	walleye	minor	Summer kill
7/28/2012	Big Sioux River	Minnehaha	all	moderate	Drought conditions, high temperatures, and low flow resulted in effluent dominated conditions and caused stress and death to fish
8/6/2012	Herman Park Pond	Lake	northern pike, black crappie, yellow perch, white bass	moderate	Summer kill
7/30/2013	Fate Dam	Lyman	black bullhead	minor	Unknown - likely bacterial infection due to stress
9/5/2013	Ravine Lake	Beadle	yellow perch, bluegill, fathead minnows, carp, pike	moderate	Unknown - low dissolved oxygen

Unsafe Beaches

During the 2010 legislative session, the legislature passed a bill which removed DENR's authority to regulate public beach closures. Additionally, effective April 15, 2013, Public Beach Standards, Chapter 74:04:08, was deleted from ARSD. 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. DENR will list a waterbody as impaired if three beach closures per season occur in a consecutive three-week sampling period. For the 2012-2013 period, there were no public beach closures reported to DENR and no waterbodies were listed as impaired due to beach closures.

Fish Consumption Advisories

During the years 2012 and 2013, 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 2012 and 2013, fish were collected from a total of 45 different locations (Table 47):

Table 47: Waterbodies Sampled for Contaminants in Fish

Waterbody	County	Years Sampled
Belle Fourche River	Butte	2013, 1997
Big Sioux River	Minnehaha	2012, 1997
Bitter Lake	Day	2013, 2003, 2001, 2000, 1999
Brant Lake	Lake	2012, 1998
Cattail/Kettle Lake	Marshall	2012, 2006, 2000
Cheyenne River	Pennington	2013, 2001, 1997
Clear Lake	Deuel	2013
Cottonwood Lake	Sully	2012, 1999
Cottonwood Lake	Spink	2013
Deerfield Lake	Pennington	2012, 1998
Dry lake	Codington	2013, 2000
East Oakwood Lake	Brookings	2013, 1998
Elm Lake	Brown	2012, 2009, 1996
Goldsmith Lake	Brookings	2013
Goose Lake	Codington	2013
Island Lake	Minnehaha/McCook	2012, 2006, 2005
James River	Beadle	2013, 1997
Lake Alice	Deuel	2013, 2007
Lake Alvin	Lincoln	2013, 1999
Lake Campbell	Brookings	2013, 2000
Lake Carthage	Miner	2013, 2001
Lake Henry	Bon Homme	2013
Lake Herman	Lake	2012, 2009, 1996
Lake Louise	Hand	2013, 2003
Lake Minnewasta	Day	2013, 2012
Lake Sinai	Brookings	2012, 2009, 1996
Lake Thompson	Kingsbury	2012, 2007, 1994
Lardy Lake	Day	2013
Lily GPA	Day	2012
Little Missouri River	Harding	2012, 2002
Little Moreau #1	Dewey	2013, 2009, 2003, 2002, 1998
Long Lake	Codington	2013
Middle Lynn Lake	Day	2013, 2012

Waterbody	County	Years Sampled
Missouri River - below Gavins Point	Yankton	2012, 2006, 2001
Murdo Lake	Jones	2012, 2006
Pudwell Dam	Corson	2013, 2008, 2007
Rapid Creek	Pennington	2012, 2001
Ravine Lake	Beadle	2013
Scott Lake	Minnehaha	2013
Sheridan Lake	Pennington	2012, 2003
Staum Dam	Beadle	2012, 2006
Swan Lake	Clark	2013, 2000
Twin Dam	Stanley	2012, 2002
Vermillion Lake	McCook	2012, 2009, 1996
Wall Lake	Minnehaha	2012,1998

Most mercury results are samples collected from individual fish using a nonlethal biopsy punch. PCB and pesticide results are composites of tissue 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 48).

Table 48: Contaminants Analyzed in Fish Flesh

PCBs	Pesticides		
Total PCBs	DDT	Chlordane	Heptachlor Epoxide
	DDE	Dieldrin	Terbufos
Metals	DDD	Endosulfan I	Toxaphene
Total Cadmium	BHC-alpha	Endosulfan II	
Total Selenium	BHC-beta	Endrin	
Total Mercury	BHC-gamma	Hexachlorobenzene	

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. Refer to Table 49 for specific fish consumption guidelines.

Waterbodies with fish consumption advisories are placed on the 303(d) list. If water quality information is available, the support status (FULL or NON) is based on water quality assessments. If water quality information is not available, the support status will be insufficient (INS). The threatened (TH) qualifier is included in the support status for mercury in fish tissue impairments.

Table 49: Waterbodies Affected by Fish and Shellfish Consumption Advisories

Waterbody	Pollutant	Size Affected (acres)	Type of Consumption Advisory			
			Non Consumption		Limited Consumption	
			General Population	Sub-Population	General Population	Sub-Population
Bitter Lake (Day)	mercury	3,142	-	-	1	1
Lake Hurley (Potter)	mercury	106	-	-	1	1
Lake Isabel (Dewey)	mercury	113	-	-	1	1
Roosevelt Lake (Tripp)	mercury	94	-	-	1	1
Twin Lakes (Kingsbury/Brookings)	mercury	513	-	-	1	1
Elm Lake (Brown)	mercury	1,220	-	-	1	1
Swan Lake (Clark)	mercury	1,928	-	-	1	1
Long Lake (Codington)	mercury	1,226	-	-	1	1
Lardy Lake (Day)	mercury	479	-	-	1	1
Lake Minnewasta (Day)	mercury	585	-	-	1	1
Middle Lynn Lake (Day)	mercury	435	-	-	1	1
Reid Lake (Clark)	mercury	1,660	-	-	1	1
Opitz Lake (Day)	mercury	1,799	-	-	1	1
Coal Springs Reservoir (Perkins)	mercury	91	-	-	1	1
North Island Lake (Minnehaha & McCook)	mercury	282	-	-	1	1
Pudwell Dam (Corson)	mercury	105	-	-	1	1
Newell Lake (Butte)	mercury	154	-	-	1	1
Twin Lakes (Minnehaha)	mercury	150	-	-	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. However, the James River (James River Diversion Dam to Huron 3rd Street Dam) is listed as not supporting that beneficial use.

Although the James River reach is designated with the domestic waters supply use, it is no longer used as a public water source. The following tables contain information on reach descriptions and pollutant causes.

Table 50: 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 51: Summary of Waterbodies Not Fully Supporting Domestic Water Supply Use

Waterbodies	AUID	Location	Characterization	Cause(s)
River and Streams				
James River	SD-JA-R-JAMES_07	James River Diversion Dam to Huron 3rd Street Dam	Not Supporting	Total Dissolved Solids
Lakes and Reservoirs				
None	-		-	

Table 52: 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	803	% Fully Supporting Domestic Water Supply Use	97%	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	23	% Not Supporting Domestic Water Supply Use	3%	Total Dissolved Solids
Total Miles Assessed for Domestic Water Supply Use	827			

Table 53: 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, 2013, the state has issued a total of 265 individual SWD permits in South Dakota. In addition, DENR has issued coverage to 2,881 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 25 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 permitees 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/cwsrf/14cwsrfiup.pdf

Between October 1, 2011, and September 30, 2013, the department's Board of Water and Natural Resources awarded 53 CWSRF loans totaling $110,062,940. Portions of six of the awards were provided as additional subsidy in the form of principal forgiveness. The principal forgiveness totaled $1,576,500. These funds were used for the design and construction of sanitary sewer collection systems, wastewater treatment facilities, storm sewers, and landfill construction associated with the protection of groundwater.

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, 2011, and September 30, 2013, the department awarded a total of $247,600 for 29 engineering studies. The Board awarded $2,270,525 for the construction of eight wastewater improvement projects and $915,000 for nine nonpoint source implementation projects.

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, 2011, and September 30, 2013, $9,870,916 in state grants was awarded to 24 wastewater collection or treatment and storm water projects. Additionally, $633,000 in state grants were awarded to provide nonfederal cost share for three section 319 nonpoint source implementation projects.

COST/BENEFIT ASSESSMENT

DENR provides the Governor and Legislature with annual reports summarizing water and wastewater development activities for the preceding calendar year. The 2012 and 2013 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 54.

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 Watershed Protection Program (WPP). 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. A new 5-year plan will be completed by September 2014.

The NPS Management Plan:

- addresses the nine mandated elements required to access Section 319 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 25 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 2013, there were 16 active NPS projects. The total includes twelve 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 DENR 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.

Historically, the majority of the projects developed and implemented focused on reducing NPS pollution originating from agricultural operations. 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 $2.5 million Section 319 funds annually from EPA. Administrative costs total about $600,000. The remaining $1.9 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 wildlife groups and conservation organizations.

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.

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. Subsequent segment are funded only if sufficient progress is made during the previous 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, 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 54: 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.

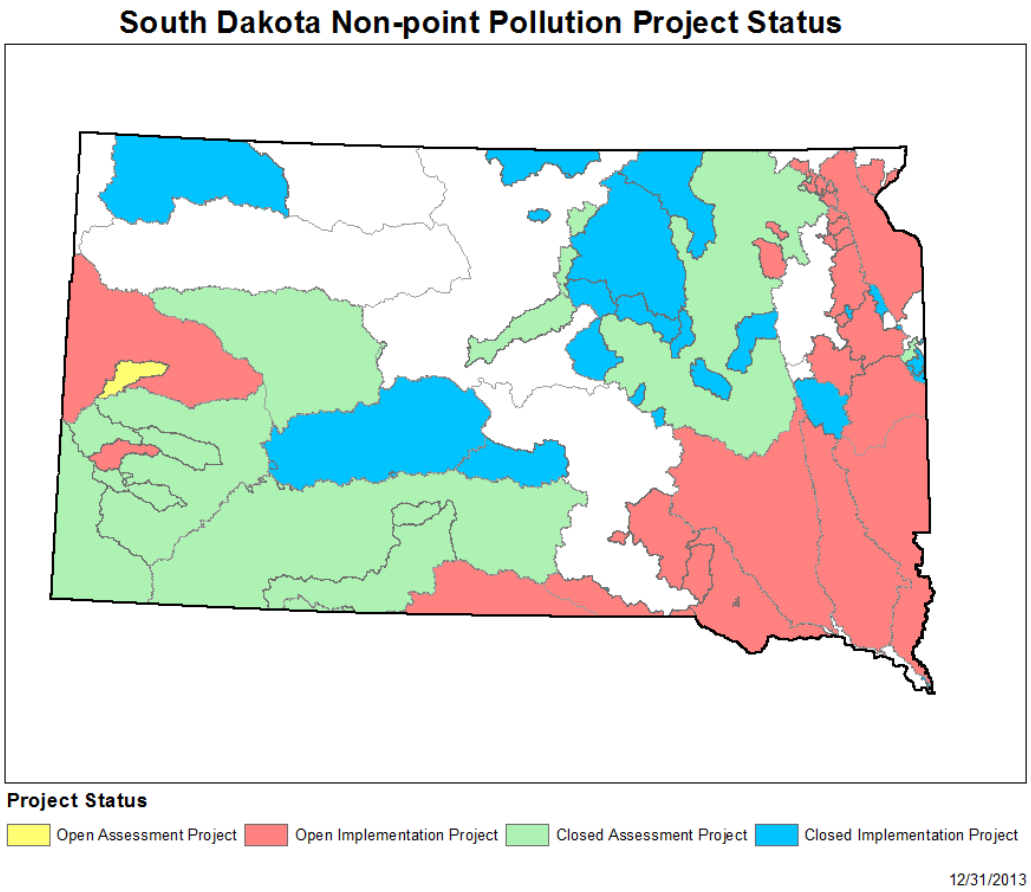


Figure 29: Status of TMDL Assessment/Implementation Projects

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 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/14irdraft.pdf. At this time, the draft report 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.

VI. REFERENCES

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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
IBI - Index of Biotic Integrity
IPCI – Index of Plant Community Integrity
NLA - National Lake Assessment
NGP - Northern Glaciated Plains
NPDES – National Pollutant Discharge Elimination System
NPS – Nonpoint Source
QA/QC – quality assurance/quality control
SAR – Sodium adsorption ratio
STORET – EPA computer data storage and retrieval system
SWD – Surface Water Discharge
SWLA – Statewide Lakes Assessments
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
WQS – South Dakota Surface Water Quality Standards
USFWS – United States Fish and Wildlife Service

APPENDICES

APPENDIX A

WATERBODIES WITH EPA APPROVED TMDLS

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Bad	Freeman Lake	SD-BA-L-FREEMAN_01	Jackson County	Nitrates/Selenium	2/7/2001	1507
Bad	Freeman Lake	SD-BA-L-FREEMAN_01	Jackson County	Total dissolved solids	9/26/2012	42516
Bad	Hayes Lake	SD-BA-L-HAYES_01	Stanley County	TSI	9/29/2004	10976
Bad	Bad River	SD-BA-R-BAD_01	Stanley County line to mouth	TSS	2/7/2001	1537
Belle Fourche	Bear Butte Cr.	SD-BF-R-BEAR_BUTTE_02	Strawberry Cr. To near Bear Den Mountain	TSS	8/8/2007	33703
Belle Fourche	Belle Fourche River	SD-BF-R-BELLE_FOURCHE_01	Wyoming to Redwater River	fecal coliform	10/17/2011	41417
Belle Fourche	Belle Fourche River		Wyoming to near Fruitdale	TSS	2/2/2005	11383
Belle Fourche	Belle Fourche River		Near Fruitdale to Whitewood Creek	TSS	2/2/2005	11384
Belle Fourche	Belle Fourche River	SD-BF-R-BELLE_FOURCHE_03	Whitewood Creek to Willow Creek	TSS	2/2/2005	11385
Belle Fourche	Belle Fourche River	SD-BF-R-BELLE_FOURCHE_04	Willow Creek to Alkali Creek	TSS	2/2/2005	11386
Belle Fourche	Belle Fourche River	SD-BF-R-BELLE_FOURCHE_05	Alkali Creek to mouth	*E. coli/fecal coliform*	10/17/2011	41418/ 41419
Belle Fourche	Belle Fourche River	SD-BF-R-BELLE_FOURCHE_05	Alkali Creek to mouth	TSS	2/2/2005	11387
Belle Fourche	Horse Creek	SD-BF-R-HORSE_01_USGS	Indian Creek to mouth	TSS	2/2/2005	11382
Belle Fourche	Strawberry Creek	SD-BF-R-STRAWBERRY_01	Bear Butte Creek to S5, T4N, R4E	Cadmium	4/19/2010	38462
Belle Fourche	West Strawberry Creek	SD-BF-R-W_STRAWBERRY_01	Headwaters to mouth	fecal coliform	4/6/2011	40169
Belle Fourche	Whitewood Creek	SD-BF-R-WHITEWOOD_03	Deadwood Creek to Spruce Gulch	*E. coli/fecal coliform*	7/28/2011	41059
Big Sioux	Lake Alvin	SD-BS-L-ALVIN_01	Lincoln County	TSI/fecal coliform	11/9/2001	2193/ 2194
Big Sioux	Blue Dog Lake	SD-BS-L-BLUE_DOG_01	Day County	TSI/fecal coliform	2/7/2001	1436

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Big Sioux	Brant Lake	SD-BS-L-BRANT_01	Lake County	TSI	4/12/1999	169
Big Sioux	Clear Lake	SD-BS-L-CLEAR_01	Deuel County	TSI/Sediment	2/7/2001	1467
Big Sioux	East Oakwood Lake	SD-BS-L-E_OAKWOOD_01	Brookings County	TSI/pH	6/13/2008	34521
Big Sioux	Lake Herman	SD-BS-L-HERMAN_01	Lake County	TSI	9/29/2004	10978
Big Sioux	Lake Madison	SD-BS-L-MADISON_01	Lake County	TSI/fish kill	4/12/1999	639
Big Sioux	Lake Kampeska	SD-BS-L-KAMPESKA_01	Codington County	Nutrients/Sediment - special approval	12/26/1996	635
Big Sioux	Pelican Lake	SD-BS-L-PELICAN_01	Codington County	Nutrients/Sediment-special approval	12/26/1996	918
Big Sioux	School Lake	SD-BS-L-SCHOOL_01	Deuel County	TSI	9/2/2008	35132
Big Sioux	West Oakwood Lake	SD-BS-L-W_OAKWOOD_01	Brookings County	TSI	6/13/2008	34522
Big Sioux	Lake Poinsett	SD-BS-L-POINSETT_01	Hamlin County	Nutrients-special approval	11/26/1996	643
Big Sioux	Beaver Creek	SD-BS-R-BEAVER_02	Split Rock Creek to SD-MN border	fecal coliform/TSS	5/28/2008	34499
Big Sioux	Beaver Creek	SD-BS-R-BEAVER_01	Big Sioux River to S9, T98N, R49W	fecal coliform	8/10/2011	41067
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_03	Willow Creek to Stray Horse Creek	fecal coliform	6/4/2008	34506
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_03	Willow Creek to Stray Horse Creek	*E. coli*	8/8/2011	41060
Big Sioux	Big Sioux River		I-29 to near Dell Rapids	TSS	5/28/2008	34495
Big Sioux	Big Sioux River		Near Dell Rapids to Below Baltic	fecal coliform	5/28/2008	34494
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_08	S2, T104N, R49W to I-90	*E. coli*/fecal coliform	9/26/2012	42519
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_08	S2, T104N, R49W to I-90	TSS	12/6/2012	53280
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_10	I-90 to diversion return	*E. coli*/fecal coliform	9/26/2012	42520

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_10	I-90 to diversion return	TSS	12/6/2012	53281
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_11	Diversion return to SF WWTF	*E. coli*/fecal coliform	9/26/2012	42522
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_11	Diversion return to SF WWTF	TSS	12/6/2012	53282
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_12	SF WWTF to above Brandon	*E. coli*/fecal coliform	9/26/2012	42523
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_12	SF WWTF to above Brandon	TSS	12/6/2012	53283
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_13	Above Brandon to Nine Mile Creek	Fecal coliform	1/23/2008	34093
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_14	Nine Mile Creek to near Fairview	*E. coli*/fecal coliform	1/23/2008	34094
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_15	Fairview to near Alcester	*E. coli*/fecal coliform	1/23/2008	34095
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_15	Fairview to near Alcester	TSS	2/1/2010	38211
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_16	Near Alcester to Indian Creek	*E. coli/fecal coliform*	1/23/2008	34096
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_16	Near Alcester to Indian Creek	TSS	2/1/2010	38213
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_17	Indian Creek to Mouth	*E. coli/fecal coliform*	1/23/2008	34098
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_17	Indian Creek to Mouth	TSS	1/23/2008	38212
Big Sioux	Brule Creek	SD-BS-R-BRULE_01	Big Sioux River to confluence with its east and west forks	fecal coliform	6/2/2011	40438
Big Sioux	East Brule Creek	SD-BS-R-EAST_BRULE_01	Confluence with Brule Creek to S3, T95N, R49W	fecal coliform	3/24/2011	40025
Big Sioux	Flandreau Creek	SD-BS-R-FLANDREAU_01	Big Sioux River to MN border	fecal coliform	5/28/2008	34496

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Big Sioux	Hidewood Creek	SD-BS-R-HIDEWOOD_01	Big Sioux River to US Hwy 77	fecal coliform	6/4/2008	34509
Big Sioux	Jack Moore Creek	SD-BS-R-JACK_MOORE-01	Big Sioux River to S33, T 107N, R 49W	fecal coliform	5/28/2008	34500
Big Sioux	North Deer Creek	SD-BS-R-NORTH_DEER_01	Six Mile Creek to US Hwy 77	fecal coliform	5/28/2008	34501
Big Sioux	Peg Munky Run	SD-BS-R-PEG_MUNKY_RUN_01	Big Sioux River to S17, T113N, R50W	fecal coliform	8/10/2011	41071
Big Sioux	Pipestone Creek	SD-BS-R-PIPESTONE_01	Split Rock Creek to MN border	fecal coliform	5/28/2008	34502
Big Sioux	Pipestone Creek	SD-BS-R-PIPESTONE_01	Split Rock Creek to MN border	*E. coli*	9/26/2012	42524
Big Sioux	Skunk Creek	SD-BS-R-SKUNK_01	Brandt Lake to mouth	fecal coliform	5/28/2008	34503
Big Sioux	Split Rock Creek	SD-BS-R-SPLIT_ROCK_01_USGS	At Corson, SD	TSS/fecal coliform	5/28/2008	34504
Big Sioux	Spring Creek	SD-BS-R-SPRING_01	Big Sioux River to S22, T109N, R47W	fecal coliform	5/28/2008	34505
Big Sioux	Stray Horse Creek	SD-BS-R-STRAYHORSE_01	Big Sioux River to S26, T116N, R51W	fecal coliform	6/4/2008	34508
Big Sioux	Willow Creek	SD-BS-R-WILLOW_01	Big Sioux River to S7, T117N, R50W	fecal coliform	6/4/2008	34507
Big Sioux	Union Creek	SD-BS-R-UNION_01	Big Sioux River to confluence with east and west forks	fecal coliform	8/8/2011	41062
Cheyenne	Center Lake	SD-CH-L-CENTER_01	Custer County	pH	3/24/2011	33707
Cheyenne	Center Lake	SD-CH-L-CENTER_01	Custer County	TSI	8/8/2007	33707
Cheyenne	Horsethief Lake	SD-CH-L-HORSETHIEF_01	Pennington	pH	3/24/2011	40026
Cheyenne	Legion Lake	SD-CH-L-LEGION_01	Custer County	pH	3/24/2011	35136
Cheyenne	Legion Lake	SD-CH-L-LEGION_01	Custer County	TSI	9/2/2008	35136
Cheyenne	Sheridan Lake	SD-CH-L-SHERIDAN_01	Pennington County	TSI	8/30/2006	31136

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Cheyenne	Sylvan Lake	SD-CH-L-SYLVAN_01	Custer County	TSI	9/1/2005	12351
Cheyenne	Beaver Creek	SD-CH-R-BEAVER_01	Wyoming border to Cheyenne River	fecal coliform	3/12/2010	38253
Cheyenne	Beaver Creek	SD-CH-R-BEAVER_01_USGS	Near Buffalo Gap	fecal coliform	9/26/2012	42518
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_03	Fall River to Cedar Creek	*E. coli/fecal coliform*	9/28/2010	39434/ 39429
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_04	Cedar Creek to Belle Fourche River	*E. coli/fecal coliform*	9/28/2010	39435/ 39430
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_05	Belle Fourche River to Bull Creek	*E. coli/fecal coliform*	9/28/2010	39436/ 39431
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_06	Bull Creek to Lake Oahe	*E. coli/fecal coliform*	9/28/2010	39437/ 39432
Cheyenne	Rapid Creek	SD-CH-R-RAPID_03	Canyon Lake to S15, T1N, R8E	*Fecal coliform*	9/28/2010	39426
Cheyenne	Rapid Creek	SD-CH-R-RAPID_04	S15, T1N, R8E to above Farmingdale	*Fecal coliform*	9/28/2010	39427
Cheyenne	Rapid Creek	SD-CH-R-RAPID_05	Above Farmingdale to Cheyenne River	*E. coli/fecal coliform*	9/28/2010	39433/ 39428
Cheyenne	Rapid Creek	SD-CH-R-RAPID_05	Above Farmingdale to Cheyenne River	TSS	9/27/2011	41087
Cheyenne	Spring Creek	SD-CH-R-SPRING_01	Headwaters to Sheridan Lake	fecal coliform	12/11/2008	35790
James	Cottonwood Lake	SD-JA-L-COTTONWOOD_	Spink County	TSI	11/9/2001	2195
James	Cresbard Lake	SD-JA-L-CRESBARD_01	Faulk County	TSI	12/3/2003	9745
James	Elm Lake	SD-JA-L-ELM_01	Brown County	TSI	4/12/1999	420
James	Lake Faulkton	SD-JA-L-FAULKTON_01	Faulk County	TSI/Sediment	4/12/1999	623
James	Lake Hanson	SD-JA-L-HANSON_01	Hanson County	TSI	6/3/2004	10623
James	Jones Lake	SD-JA-L-JONES_01	Hand County	TSI	4/2/2003	9747
James	Lake Louise	SD-JA-L-LOUISE_01	Hand County	TSI	11/9/2001	2196

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
James	Loyalton Dam	SD-JA-L-LOYALTON_01	Edmunds County	TSI	4/2/2003	9748
James	Mina Lake	SD-JA-L-MINA_01	Edmunds County	TSI	4/2/2003	9749
James	Dawson Creek	SD-JA-R-DAWSON_01	James River to Lake Henry	*E. coli/fecal coliform*	6/2/2011	40437
James	James River	SD-JA-R-JAMES_11	Yankton County line to mouth	fecal coliform	3/24/2011	40029
James	Wolf Creek	SD-JA-R-WOLF_02	Just above Wolf Creek Colony to mouth	TSS	8/8/2011	41061
James	Moccasin Creek		Aberdeen to Warner	Ammonia	3/19/2001	1581
James	Ravine Lake	SD-JA-L-RAVINE_01	Beadle County	TSI/fecal coliform	4/12/1999	976
James	Richmond Lake	SD-JA-L-RICHMOND_01	Brown County	TSI	8/8/2007	33708
James	Rosehill Lake	SD-JA-L-ROSEHILL_01	Hand County	TSI	4/2/2003	9750
James	Lake Byron	SD-JA-L-BYRON_01	Beadle County	Nutrients/Sediment-special approval	4/12/1999	618
James	Lake Mitchell	SD-JA-L-MITCHELL_01	Davison County	Nutrients-special approval	4/22/1997	2254
James	Lake Redfield	SD-JA-L-REDFIELD_01	Spink County	Nutrients/Sediment-special approval	4/12/1999	645
James	Firesteel Creek	SD-JA-R-FIRESTEEL_01	West Fork Firesteel to mouth	Nutrients-special approval	4/22/1997	641
James	Pierre Creek	SD-JA-R-PIERRE_01	James River to S11, T102N, R58W	fecal coliform	9/29/2009	37333
James	Pierre Creek	SD-JA-R-PIERRE_01	James River to S11, T102N, R58W	*E. coli*	12/5/2011	41443
Minnesota	Lake Alice	SD-MN-L-ALICE_01	Deuel County	TSI	6/3/2004	10622
Minnesota	Fish Lake	SD-MN-L-FISH_01	Deuel County	TSI	9/29/2004	10971
Minnesota	Lake Hendricks	SD-MN-L-HENDRICKS_01	Brookings County	TSI/Sediment	4/12/1999	631
Minnesota	Lake Oliver	SD-MN-L-OLIVER_01	Deuel County	TSI	11/9/2001	2197
Minnesota	Punished Woman Lake	SD-MN-L-PUNISHED_WOMAN_01	Codington County	TSI/Sediment	2/7/2001	1621

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Minnesota	Big Stone Lake	SD-MN-L-BIG_STONE_01	Roberts County	Nutrients-special approval	12/26/1996	123
Missouri	Brakke Dam	SD-MI-L-BRAKKE_01	Lyman County	TSI	9/29/2004	10967
Missouri	Burke Lake	SD-MI-L-BURKE_01	Gregory County	DO/pH/TSI	8/8/2007	10983/ 33706/ 33706
Missouri	Byre Lake	SD-MI-L-BYRE_01	Lyman County	TSI	6/3/2004	10983
Missouri	Corsica Lake	SD-MI-L-CORSICA_01	Douglas County	TSI	8/30/2006	31143
Missouri	Dante Lake	SD-MI-L-DANTE_01	Charles Mix County	TSI/DO	9/27/2006	31192
Missouri	Geddes Lake	SD-MI-L-GEDDES_01	Charles Mix County	TSI/DO	5/6/2008	34513
Missouri	Fate Dam	SD-MI-L-FATE_01	Lyman County	TSI	1/14/2005	11380
Missouri	Hiddenwood Lake	SD-MI-L-HIDDENWOOD_01	Walworth County	TSI/Sediment	4/12/1999	632
Missouri	McCook Lake	SD-MI-L-MCCOOK_01	Union County	TSI	4/12/1999	770
Missouri	Choteau Creek	SD-MI-R-CHOTEAU_01	Lewis & Clark Lake to S34, T96N, R63W	TSS	5/3/2010	38613
Missouri	Emanuel Creek	SD-MI-R-EMANUEL_01	Lewis and Clark Lake to S20, T94N, R60W	*E. coli*	8/10/2011	41068
Missouri	Emanuel Creek	SD-MI-R-EMANUEL_01	Lewis and Clark Lake to S20, T94N, R60W	fecal coliform/TSS	9/29/2009	37330/ 37331
Missouri	Medicine Creek	SD-MI-R-MEDICINE_01	Lake Sharpe to US Hwy 83	fecal coliform/TSS	8/30/2006	31146
Missouri	Ponca Creek	SD-MI-R-PONCA_01	SD/NE border to US Hwy 183	fecal coliform	8/2/2010	39029
Missouri	Ponca Creek	SD-MI-R-PONCA_01	SD/NE border to US Hwy 183	TSS	4/27/2010	38463
Missouri	Missouri River (Sharpe)	SD-MI-R-SHARPE_01	Oahe Dam to Big Bend Dam	Sediment	2/7/2001	1537
Niobrara	Keya Paha River	SD-NI-R-KEYA_PAHA_01	Keya Paha to NE border	*E. coli*	9/22/2011	41085
Niobrara	Keya Paha River	SD-NI-R-KEYA_PAHA_01	Keya Paha to NE border	TSS	9/29/2009	37332
Niobrara	Keya Paha River	SD-NI-R-KEYA_PAHA_01	Keya Paha to NE border	fecal coliform	2/1/2010	38214

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Red River	White Lake	SD-RD-L-WHITE_01	Marshall County	DO/TSI	8/20/2006	31133
Vermillion	Swan Lake	SD-VM-L-SWAN_01	Turner County	TSI/Sediment	4/12/1999	1169/ 1168
Vermillion	East Fork Vermillion River	SD-VM-R-VERMILLION_EAST_FORK_01	McCook/Lake County to Little Vermillion River	Fecal coliform	9/26/2012	42525
Vermillion	Vermillion River	SD-VM-R-VERMILLION_02	Turkey Ridge Creek to Baptist Creek	TSS	9/27/2010	39404
Vermillion	Vermillion River	SD-VM-R-VERMILLION_03	Baptist Creek to mouth	TSS	7/5/2011	40439
Vermillion	Turkey Ridge Creek		Vermillion River to S31, T98N, R53W	fecal coliform	9/27/2006	31212

APPENDIX B

DENR 2014 WATERBODY DELISTING REPORT

AUID	Name	Location	Cause	2014 Category	Delisting Reason
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	Specific Conductance	5	TMDL approved or established by EPA (4A)
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	Total Dissolved Solids	5	TMDL approved or established by EPA (4A)
SD-BS-L-E_OAKWOOD_01	East Oakwood Lake	Brookings County	pH	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_08	Big Sioux River	S2, T104N, R49W to I-90	Escherichia coli	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_08	Big Sioux River	S2, T104N, R49W to I-90	Total Suspended Solids	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	Escherichia coli	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	Fecal Coliform	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	Total Suspended Solids	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_11	Big Sioux River	Diversion return to SF WWTF	Escherichia coli	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_11	Big Sioux River	Diversion return to SF WWTF	Fecal Coliform	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_11	Big Sioux River	Diversion return to SF WWTF	Total Suspended Solids	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_12	Big Sioux River	SF WWTF to above Brandon	Escherichia coli	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_12	Big Sioux River	SF WWTF to above Brandon	Fecal Coliform	4a	TMDL approved or established by EPA (4A)
SD-BS-R-BIG_SIOUX_12	Big Sioux River	SF WWTF to above Brandon	Total Suspended Solids	4a	TMDL approved or established by EPA (4A)
SD-BS-R-PIPESTONE_01	Pipestone Creek	Split Rock Creek to Minnesota border	Escherichia coli	4a	TMDL approved or established by EPA (4A)
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	Total Suspended Solids	5	Applicable WQS attained; threatened water no longer threatened
SD-CH-R-BEAVER_01_USGS	Beaver Creek	Near Buffalo Gap	Fecal Coliform	4a	TMDL approved or established by EPA (4A)
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	Alkalinity, Carbonate as CaCO3	5	Applicable WQS attained; reason for recovery unspecified
SD-CH-R-RAPID_03	Rapid Creek	Canyon Lake to S15, T1N, R8E	Temperature, water	4a	Applicable WQS attained; reason for recovery unspecified
SD-GR-R-GRAND_03	Grand River	Bullhead to mouth	Salinity(SAR)	5	Applicable WQS attained; threatened water no longer threatened
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	North Dakota border to Shadehill Reservoir	Specific Conductance	5	Applicable WQS attained; original basis for listing was incorrect
SD-JA-L-FAULKTON_01	Lake Faulkton	Faulk County	pH	4a	Applicable WQS attained; reason for recovery unspecified
SD-JA-L-WILMARTH_01	Wilmarth Lake	Aurora County	Chlorophyll-a	5	Data and/or information lacking to determine water quality status; original basis for listing was incorrect
SD-JA-R-PIERRE_01	Pierre Creek	James River to S11, T102N, R58W	Escherichia coli	4a	TMDL approved or established by EPA (4A)
SD-JA-R-TURTLE_01	Turtle Creek	James River to S17, T113N, R65W	pH	5	Applicable WQS attained; reason for recovery unspecified

AUID	Name	Location	Cause	2014 Category	Delisting Reason
SD-MI-L-CAMPBELL_01	Lake Campbell	Campbell County	Chlorophyll-a	5	Data and/or information lacking to determine water quality status; original basis for listing was incorrect
SD-MI-L-COTTONWOOD_01	Cottonwood Lake	Sully County	Chlorophyll-a	3	Data and/or information lacking to determine water quality status; original basis for listing was incorrect
SD-MI-L-GEDDES_01	Geddes Lake	Charles Mix County	pH	4a	Applicable WQS attained; reason for recovery unspecified
SD-MN-R-LITTLE_MINNESOTA_01	Little Minnesota River	Big Stone Lake to S24, T126N, R51W	Oxygen, Dissolved	1	Applicable WQS attained; according to new assessment method
SD-VM-R-VERMILLION_E_FORK_01	East Fork Vermillion River	McCook/Lake County line to Little Vermillion River	Oxygen, Dissolved	4a	Applicable WQS attained; original basis for listing was incorrect
SD-VM-R-VERMILLION_E_FORK_01	East Fork Vermillion River	McCook/Lake County line to Little Vermillion River	Fecal Coliform	4a	TMDL approved or established by EPA (4A)

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	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	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 December 17, 2013

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
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

WQM #	Waterbody	Storet Number	County	Sampling Frequency	Beneficial Uses	Analysis Group	Region
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	1,2,7,8,9,10,11	Group 2	Central
72	Missouri River	460672	LYMAN	Quarterly	1,2,7,8,9,10,11	Group 2	Central
73	Missouri River	460673	CHARLES MIX	Quarterly	1,4,7,8,9,10,11	Group 2	Southeast
74	Missouri River	460674	YANKTON	Quarterly	1,4,7,8,9,10,11	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
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

WQM #	Waterbody	Storet Number	County	Sampling Frequency	Beneficial Uses	Analysis Group	Region
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
164	Cheyenne River	460164	Fall River	Quarterly	5,8,9,10	Group 11	Black Hills
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 2	Southeast
MN31	Annie Creek	46MN31	LAWRENCE	Quarterly	3,8,9,10	Group 5	Black Hills
MN32	Spearfish Creek	46MN32	LAWRENCE	Quarterly	1,2,7,8,9,10,11	Group 5	Black Hills
MN33	Spearfish Creek	46MN33	LAWRENCE	Quarterly	1,2,7,8,9,10,11	Group 5	Black Hills
MN34	Spearfish Creek	46MN34	LAWRENCE	Quarterly	1,2,7,8,9,10,11	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

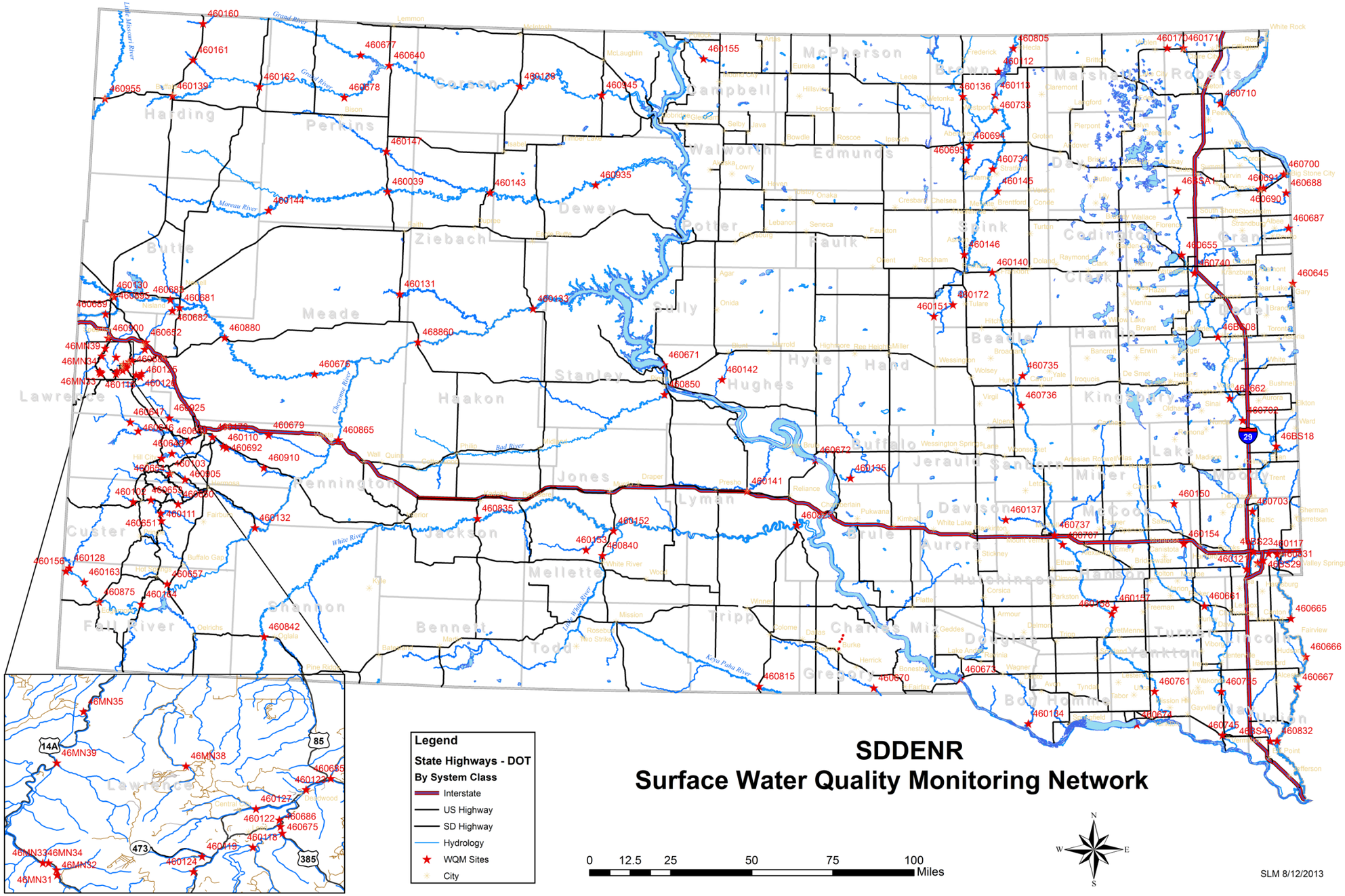

Figure 30: South Dakota DENR Water Quality Monitoring Sites

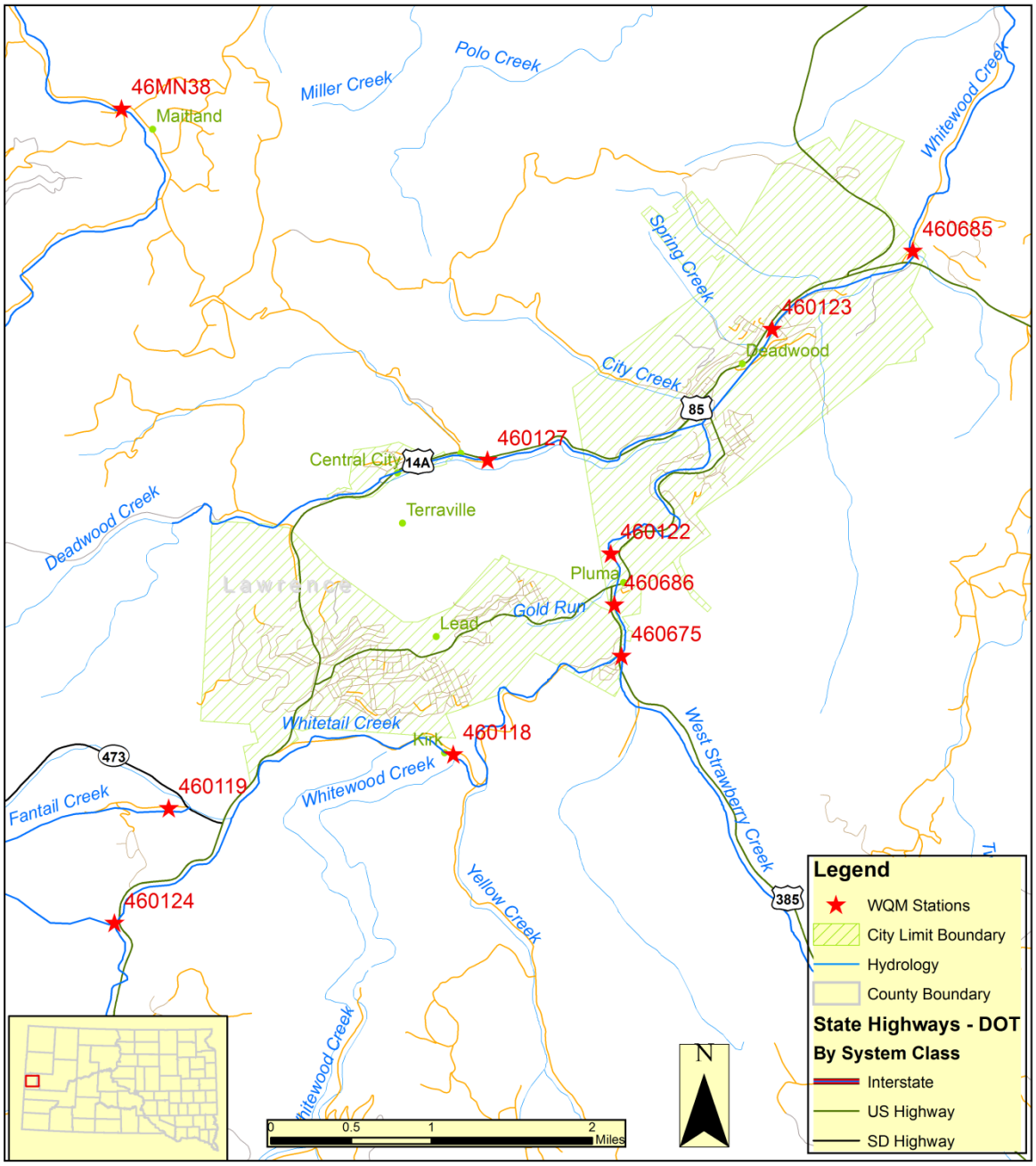

Figure 31: Water Quality Monitoring Sites on Whitewood Creek and Tributaries in Lead-Deadwood Area

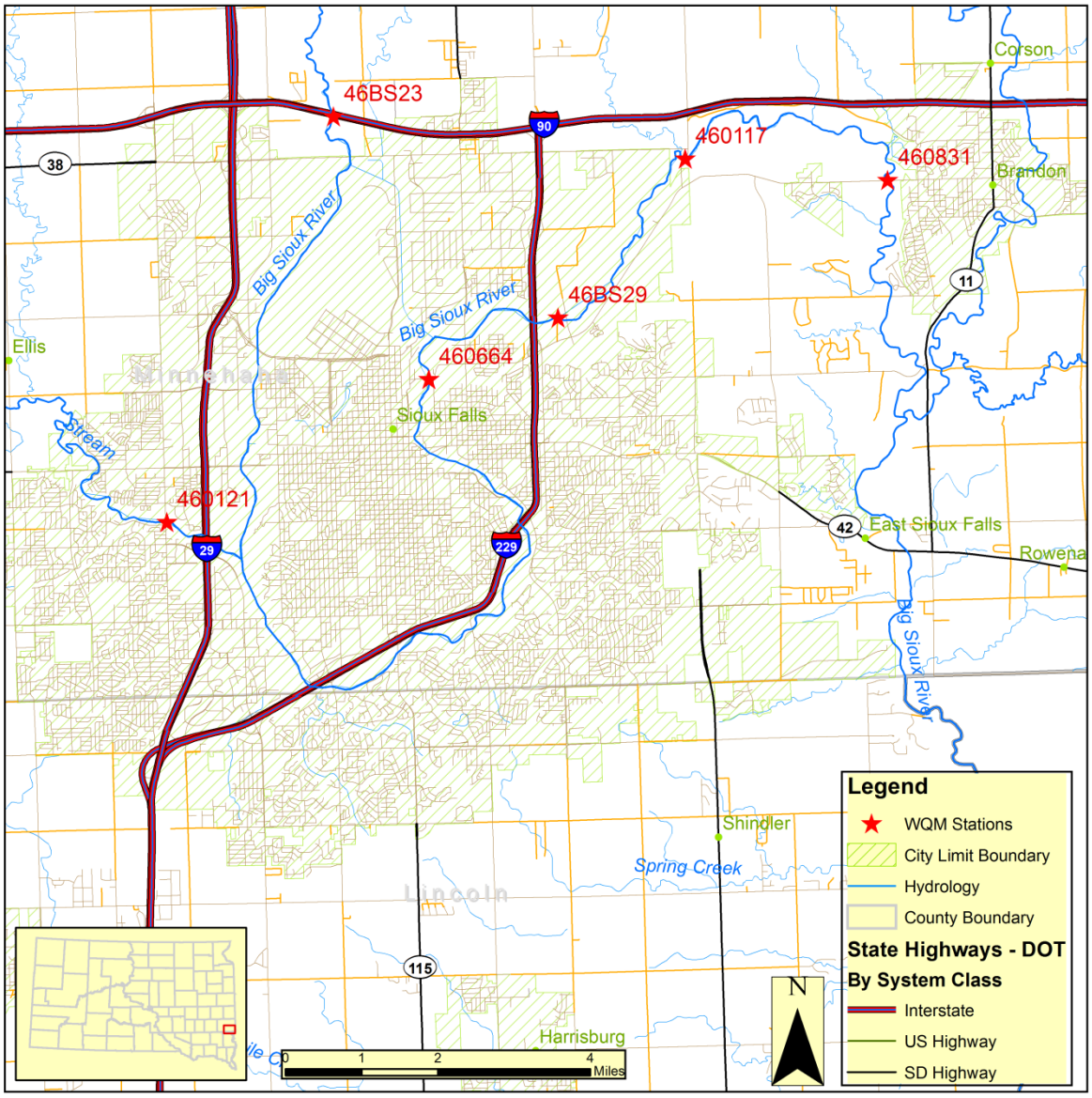

Figure 32: Water Quality Monitoring Sites Located on the Big Sioux River in the Sioux Falls Area

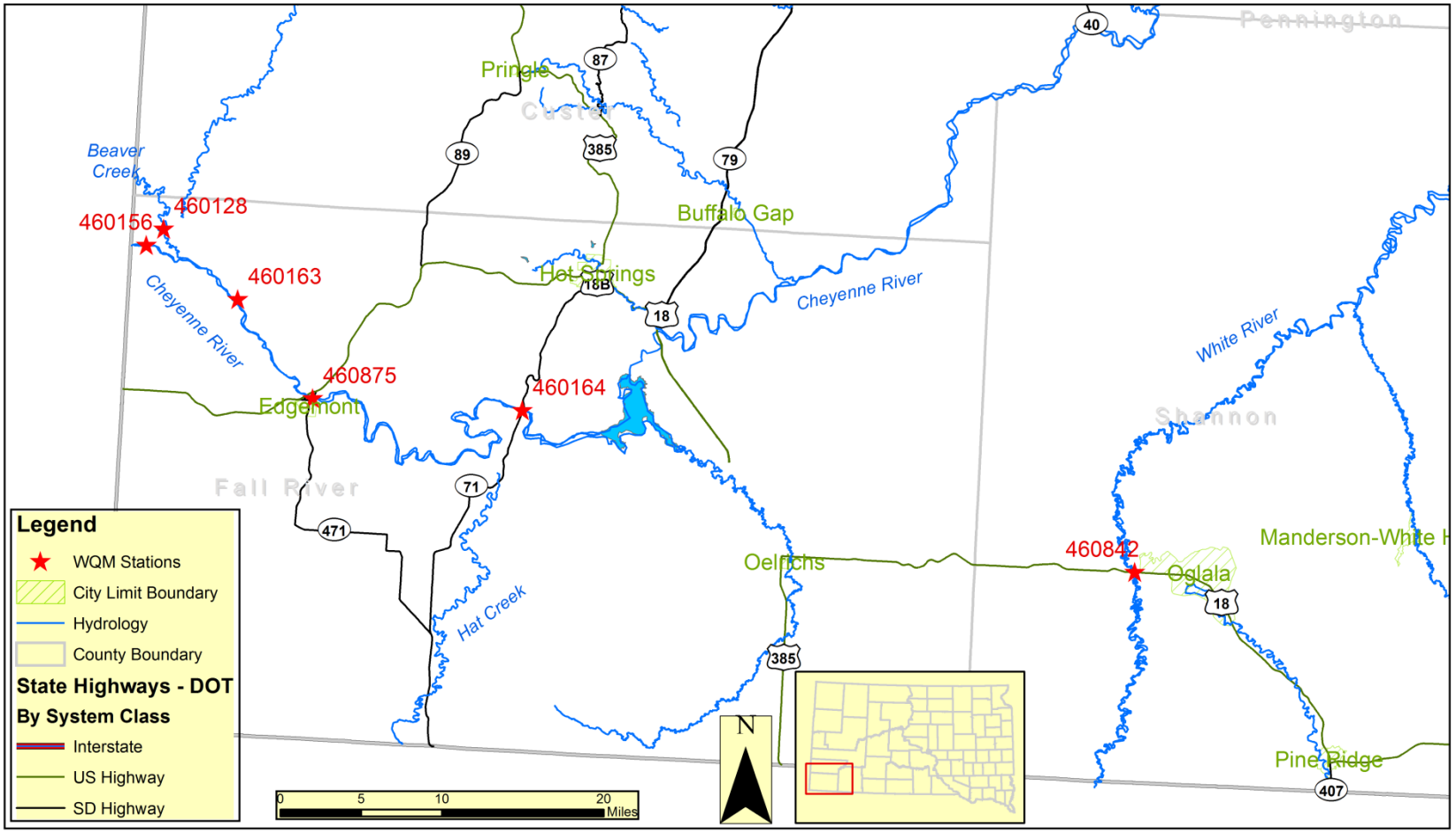

Figure 33: Water Quality Monitoring Sites Located along the Cheyenne River and White River that are Monitored for Uranium

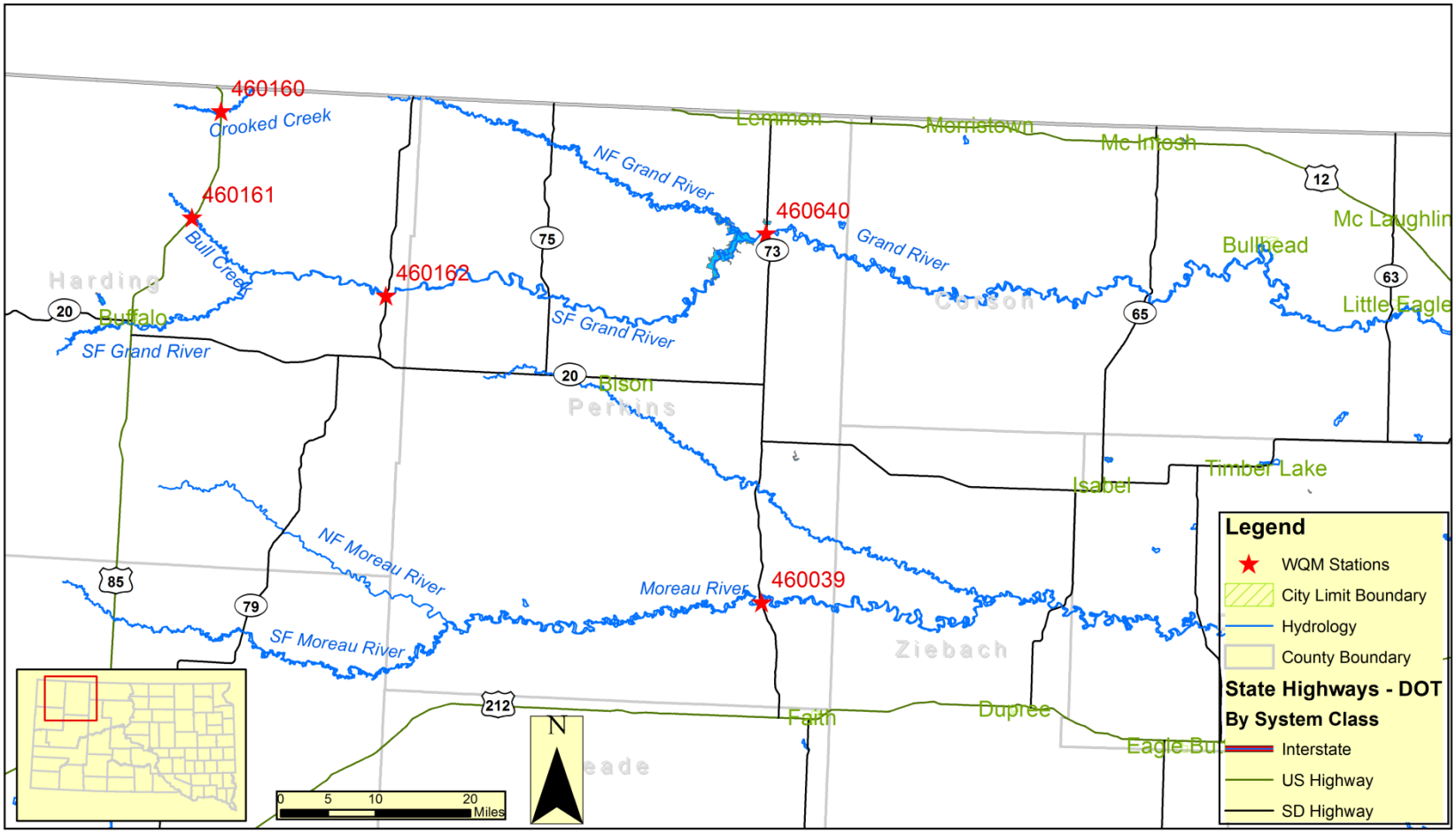

Figure 34: Water Quality Monitoring Sites Located near the Grand River and Moreau River that are Monitored for Uranium

APPENDIX D

303(D) SUMMARY

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	Oxygen, Dissolved	2010	2	2018
SD-BA-L-FREEMAN_01	Freeman Lake	Jackson County	Chlorophyll-a	2014	2	2026
SD-BA-L-MURDO_01	Murdo Dam	Jones County	Oxygen, Dissolved	2012	2	2024
SD-BA-L-WAGGONER_01	Waggoner Lake	Haakon County	Chlorophyll-a	2010	2	2022
SD-BA-R-BAD_01	Bad River	Stanley County line to mouth	Specific Conductance	2004	2	2026
SD-BF-L-IRON_CREEK_01	Iron Creek Lake	Lawrence County	Temperature, water	2010	2	2022
SD-BF-L-MIRROR_EAST_01	Mirror Lake East	Lawrence County	Temperature, water	2006	2	2018
SD-BF-L-MIRROR_WEST_01	Mirror Lake West	Lawrence County	Temperature, water	2008	2	2020
SD-BF-L-NEWELL_01	Newell Lake	Butte County	Mercury in fish tissue	2012	2	2016
SD-BF-L-NEWELL_CITY_01	Newell City Pond	Butte County	Temperature, water	2010	2	2022
SD-BF-R-BEAR_BUTTE_01	Bear Butte Creek	Headwaters to Strawberry Creek	Temperature, water	1998	2	2011
SD-BF-R-BEAR_BUTTE_02	Bear Butte Creek	Strawberry Creek to S2, T4N, R4E	Temperature, water	2008	2	2020
SD-BF-R-BELLE_FOURCHE_01	Belle Fourche River	Wyoming border to Redwater River	Escherichia coli	2012	1	2014
SD-BF-R-DEADWOOD_01	Deadwood Creek	Rutabaga Gulch to Whitewood Creek	Escherichia coli	2014	1	2016
SD-BF-R-REDWATER_01_USGS	Redwater River	WY border to Hwy 85	Temperature, water	2008	2	2020
SD-BF-R-WHITEWOOD_01	Whitewood Creek	Whitetail Summit to Gold Run Creek	Temperature, water	2006	2	2018
SD-BF-R-WHITEWOOD_04	Whitewood Creek	Spruce Gulch to Sandy Creek	Fecal Coliform	2004	1	2016
SD-BF-R-WHITEWOOD_04	Whitewood Creek	Spruce Gulch to Sandy Creek	Escherichia coli	2012	1	2016
SD-BF-R-WHITEWOOD_05	Whitewood Creek	Sandy Creek to I-90	pH (high)	2006	2	2018
SD-BF-R-WHITEWOOD_06	Whitewood Creek	I-90 to Crow Creek	pH (high)	2008	2	2020
SD-BF-R-WHITEWOOD_06	Whitewood Creek	I-90 to Crow Creek	Escherichia coli	2014	1	2016
SD-BF-R-WHITEWOOD_07	Whitewood Creek	Crow Creek to mouth	Total Suspended Solids	2010	1	2016
SD-BS-L-ALBERT_01	Lake Albert	Kingsbury County	Oxygen, Dissolved	2014	2	2026
SD-BS-L-ALVIN_01	Lake Alvin	Lincoln County	Temperature, water	2010	2	2022
SD-BS-L-BITTER_01	Bitter Lake	Day County	Mercury in fish tissue	2006	2	2016
SD-BS-L-BLUE_DOG_01	Blue Dog Lake	Day County	pH (high)	2010	2	2022
SD-BS-L-BULLHEAD_01	Bullhead Lake	Deuel County	Chlorophyll-a	2010	2	2022

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-BS-L-ISLAND_N_01	North Island Lake	Minnehaha/McCook counties (formerly SD-VM-L-ISLAND_N_01)	Mercury in fish tissue	2010	2	2016
SD-BS-L-LARDY_01	Lardy Lake	Day County	Mercury in fish tissue	2014	2	2026
SD-BS-L-LONG_COD_01	Long Lake	Codington County	Mercury in fish tissue	2014	2	2026
SD-BS-L-MID_LYNN_01	Middle Lynn Lake	Day County	Mercury in fish tissue	2014	2	2026
SD-BS-L-MINNEWASTA_01	Minnewasta Lake	Day County	Mercury in fish tissue	2014	2	2026
SD-BS-L-MINNEWASTA_01	Minnewasta Lake	Day County	Chlorophyll-a	2014	2	2026
SD-BS-L-OPITZ_01	Opitz Lake	Day County	Mercury in fish tissue	2012	2	2016
SD-BS-L-PELICAN_01	Pelican Lake	Codington County	pH (high)	2008	2	2020
SD-BS-L-REID_01	Reid Lake	Clark County	Mercury in fish tissue	2012	2	2016
SD-BS-L-SWAN_01	Swan Lake	Clark County	Mercury in fish tissue	2014	2	2026
SD-BS-L-TWIN_01	Twin Lakes/W. Hwy 81	Kingsbury County	Mercury in fish tissue	2006	2	2016
SD-BS-L-TWIN_02	Twin Lakes	Minnehaha County	Mercury in fish tissue	2010	2	2016
SD-BS-L-WAUBAY_01	Waubay Lake	Day County	Chlorophyll-a	2014	2	2026
SD-BS-R-BEAVER_02	Beaver Creek	Split Rock Creek to South Dakota-Minnesota border	Escherichia coli	2014	2	2026
SD-BS-R-BIG_SIOUX_01	Big Sioux River	S28, T121N, R52W to Lake Kampeska	Oxygen, Dissolved	2004	1	2016
SD-BS-R-BIG_SIOUX_01	Big Sioux River	S28, T121N, R52W to Lake Kampeska	Escherichia coli	2010	1	2014
SD-BS-R-BIG_SIOUX_02	Big Sioux River	Lake Kampeska to Willow Creek	Oxygen, Dissolved	2014	2	2026
SD-BS-R-BIG_SIOUX_05	Big Sioux River	Near Volga to Brookings	Total Suspended Solids	2004	1	2016
SD-BS-R-BIG_SIOUX_06	Big Sioux River	Brookings to Brookings/Moody County Line	Total Suspended Solids	2004	1	2016
SD-BS-R-BIG_SIOUX_13	Big Sioux River	Above Brandon to Nine Mile Creek	Total Suspended Solids	2004	1	2016
SD-BS-R-BIG_SIOUX_13	Big Sioux River	Above Brandon to Nine Mile Creek	Escherichia coli	2012	1	2016
SD-BS-R-BIG_SIOUX_14	Big Sioux River	Nine Mile Creek to near Fairview	Total Suspended Solids	2004	1	2016
SD-BS-R-BRULE_01	Brule Creek	Big Sioux River to confluence of its east and west forks	Escherichia coli	2014	1	2016
SD-BS-R-EAST_BRULE_01	East Brule Creek	confluence with Brule Creek to S3, T95N, R49W	Total Suspended Solids	2008	1	2009
SD-BS-R-FLANDREAU_01	Flandreau Creek	Big Sioux River to Minnesota Border	Escherichia coli	2014	1	2016
SD-BS-R-SIXMILE_01	Six Mile Creek	Big Sioux River to S30, T112N, R48W	Total Suspended Solids	2014	1	2016

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-BS-R-SIXMILE_01	Six Mile Creek	Big Sioux River to S30, T112N, R48W	Fecal Coliform	2010	1	2016
SD-BS-R-SIXMILE_01	Six Mile Creek	Big Sioux River to S30, T112N, R48W	Escherichia coli	2014	1	2016
SD-BS-R-SKUNK_01	Skunk Creek	Brandt Lake to Big Sioux River	Total Suspended Solids	2012	1	2016
SD-BS-R-SKUNK_01	Skunk Creek	Brandt Lake to Big Sioux River	Escherichia coli	2014	1	2016
SD-BS-R-UNION_01	Union Creek	Big Sioux River to confluence with East and West Forks	Total Suspended Solids	2008	1	2010
SD-CH-L-CENTER_01	Center Lake	Custer County	Temperature, water	2008	2	2020
SD-CH-L-COLD_BROOK_01	Cold Brook Reservoir	Fall River County	Temperature, water	2006	2	2018
SD-CH-L-DEERFIELD_01	Deerfield Lake	Pennington County	Temperature, water	2010	2	2022
SD-CH-L-HORSETHIEF_01	Horsethief Lake	Pennington County	Temperature, water	2006	2	2018
SD-CH-L-NEW_WALL_01	New Wall Lake	Pennington County	pH (high)	2010	2	2022
SD-CH-L-SHERIDAN_01	Sheridan Lake	Pennington County	Temperature, water	2006	2	2018
SD-CH-L-SHERIDAN_01	Sheridan Lake	Pennington County	Oxygen, Dissolved	2006	2	2018
SD-CH-L-SYLVAN_01	Sylvan Lake	Custer County	Temperature, water	2008	2	2020
SD-CH-R-BATTLE_01	Battle Creek	Near Horsethief Lake to Teepee Gulch Creek	Temperature, water	2004	2	2011
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	Fecal Coliform	2010	1	2014
SD-CH-R-BATTLE_01_USGS	Battle Creek	Hwy 79 to mouth	Escherichia coli	2012	1	2014
SD-CH-R-BATTLE_02	Battle Creek	Teepee Gulch Creek to SD HWY 79	Temperature, water	2004	2	2011
SD-CH-R-BATTLE_02	Battle Creek	Teepee Gulch Creek to SD HWY 79	Fecal Coliform	2012	1	2014
SD-CH-R-BATTLE_02	Battle Creek	Teepee Gulch Creek to SD HWY 79	Escherichia coli	2012	1	2014
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	Total Dissolved Solids	2004	2	2010
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	Specific Conductance	2004	2	2010
SD-CH-R-BEAVER_01	Beaver Creek	WY border to Cheyenne River	Salinity (SAR)	2006	2	2026
SD-CH-R-BEAVER_02_USGS	Beaver Creek	S13, T5N, R4E to SD Hwy 79	Temperature, water	2006	2	2016
SD-CH-R-CASTLE_01	Castle Creek	Deerfield Reservoir to Rapid Creek	Total Suspended Solids	2014	1	2016
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	Total Suspended Solids	2012	1	2016
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	Specific Conductance	2004	2	2026
SD-CH-R-CHEYENNE_01	Cheyenne River	WY border to Beaver Creek	Salinity (SAR)	2014	2	2026

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Total Suspended Solids	2004	1	2016
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Total Dissolved Solids	2004	1	2013
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Specific Conductance	2004	1	2013
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Salinity (SAR)	2008	1	2013
SD-CH-R-CHEYENNE_02	Cheyenne River	Beaver Creek to Cascade Creek	Escherichia coli	2014	2	2026
SD-CH-R-CHEYENNE_03	Cheyenne River	Fall River to Cedar Creek	Total Suspended Solids	2004	1	2013
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	Total Suspended Solids	2004	1	2013
SD-CH-R-CHEYENNE_04	Cheyenne River	Cedar Creek to Belle Fourche River	Total Dissolved Solids	2010	2	2026
SD-CH-R-CHEYENNE_05	Cheyenne River	Belle Fourche River to Bull Creek	Total Suspended Solids	2004	1	2013
SD-CH-R-CHEYENNE_06	Cheyenne River	Bull Creek to Lake Oahe	Total Suspended Solids	2004	1	2013
SD-CH-R-ELK_01_USGS	Elk Creek	S9, T3N, R7E to S27, T4N, R3E	Temperature, water	2008	2	2020
SD-CH-R-FALL_01	Fall River	Hot Springs to mouth	Temperature, water	2004	2	2017
SD-CH-R-GRACE_COOLIDGE_01	Grace Coolidge Creek	S12, T3S, R5E to Battle Creek	Temperature, water	2004	2	2015
SD-CH-R-GRIZZLY_BEAR_01_USGS	Grizzly Bear Creek	Near Keystone, SD	Temperature, water	2006	2	2018
SD-CH-R-HIGHLAND_01_USGS	Highland Creek	Wind Cave Natl Park and near Pringle, SD	Temperature, water	2006	2	2018
SD-CH-R-HIGHLAND_01_USGS	Highland Creek	Wind Cave Natl Park and near Pringle, SD	pH (high)	2006	2	2018
SD-CH-R-HOT_BROOK_01	Hot Brook Creek	Fall River to S19, T7S, R5E	Temperature, water	2006	2	2018
SD-CH-R-RAPID_04	Rapid Creek	S15, T1N, R8E to above Farmingdale	Escherichia coli	2014	1	2016
SD-CH-R-RAPID_N_FORK_01	North Fork Rapid Creek	From confluence with Rapid Creek to S8, T3N, R3E	Temperature, water	2004	2	2016
SD-CH-R-SPRING_01	Spring Creek	S5, T2S, R3E to Sheridan Lake	Total Suspended Solids	2014	1	2016
SD-CH-R-SPRING_01	Spring Creek	S5, T2S, R3E to Sheridan Lake	Temperature, water	2008	2	2020
SD-CH-R-SPRING_01	Spring Creek	S5, T2S, R3E to Sheridan Lake	Escherichia coli	2014	1	2016
SD-CH-R-VICTORIA_01_USGS	Victoria Creek	Rapid Creek to S19, T1N, R6E	Temperature, water	1998	2	2011
SD-GR-L-ISABEL_01	Lake Isabel	Dewey County	Mercury in fish tissue	2006	D**	
SD-GR-L-ISABEL_01	Lake Isabel	Dewey County	Chlorophyll-a	2010	D**	

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-GR-L-PUDWELL_01	Pudwell Dam	Corson County	Mercury in fish tissue	2010	D**	
SD-GR-L-SHADEHILL_01	Shadehill Reservoir	Perkins County	Salinity (SAR)	2004	D**	
SD-GR-R-BULL_01	Bull Creek	SF Grand River to S15, T21N, R5E	Salinity (SAR)	2012	D**	
SD-GR-R-CROOKED_01	Crooked Creek	ND border to S34, T23N, R5E	Specific Conductance	2014	D**	
SD-GR-R-CROOKED_01	Crooked Creek	ND border to S34, T23N, R5E	Salinity (SAR)	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 (SAR)	2004	D**	
SD-GR-R-GRAND_02	Grand River	Corson County line to Bullhead	Total Suspended Solids	2004	D**	
SD-GR-R-GRAND_02	Grand River	Corson County line to Bullhead	Salinity (SAR)	2004	D**	
SD-GR-R-GRAND_02	Grand River	Corson County line to Bullhead	Escherichia coli	2014	D**	
SD-GR-R-GRAND_03	Grand River	Bullhead to mouth	Total Suspended Solids	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	Escherichia coli	2010	D**	
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	North Dakota border to Shadehill Reservoir	Salinity (SAR)	2004	D**	
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	Jerry Creek to Skull Creek	Total Suspended Solids	2004	D**	
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	Jerry Creek to Skull Creek	Salinity (SAR)	2006	D**	
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	Skull Creek to Shadehill Reservoir	Total Suspended Solids	2004	D**	
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	Skull Creek to Shadehill Reservoir	Salinity (SAR)	2004	D**	
SD-JA-L-BIERMAN_01	Bierman Dam	Spink County	Chlorophyll-a	2010	2	2022
SD-JA-L-BYRON_01	Lake Byron	Beadle County	pH (high)	2010	2	2022
SD-JA-L-CARTHAGE_01	Lake Carthage	Miner County	Chlorophyll-a	2010	2	2022
SD-JA-L-CRESBARD_01	Cresbard Lake	Faulk County	pH (high)	2010	2	2022
SD-JA-L-ELM_01	Elm Lake	Brown County	Mercury in fish tissue	2014	2	2026
SD-JA-L-FOUR_MILE_01	Four Mile Lake	Marshall County (formerly SD-BS-L-FOUR_MILE_01)	pH (high)	2012	2	2024
SD-JA-L-JONES_01	Jones Lake	Hand County	pH (high)	2006	2	2018
SD-JA-L-LATHAM_01	Latham	Faulk County	Oxygen, Dissolved	2012	2	2024
SD-JA-L-LOUISE_01	Lake Louise	Hand County	pH (high)	2008	2	2020

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-JA-L-LOUISE_01	Lake Louise	Hand County	Oxygen, Dissolved	2014	2	2026
SD-JA-L-MINA_01	Mina Lake	Edmunds County	Oxygen, Dissolved	2012	2	2024
SD-JA-L-MITCHELL_01	Lake Mitchell	Davison County	pH (high)	2012	2	2024
SD-JA-L-NINE_MILE_01	Nine Mile Lake	Marshall County (formerly SD-BS-L-NINE_MILE_01)	pH (high)	2010	2	2022
SD-JA-L-PIERPONT_01	Pierpont Lake	Day County	Temperature, water	2012	2	2024
SD-JA-L-RAVINE_01	Ravine Lake	Beadle County	Oxygen, Dissolved	2012	2	2024
SD-JA-L-REDFIELD_01	Lake Redfield	Spink County	Oxygen, Dissolved	2010	2	2022
SD-JA-L-ROSETTE_01	Rosette Lake	Edmunds County	Chlorophyll-a	2014	2	2026
SD-JA-L-S_RED_IRON_01	South Red Iron Lake	Marshall County (formerly SD-BS-L-S_RED_IRON_01)	Temperature, water	2014	2	2026
SD-JA-L-SOUTH_BUFFALO_01	South Buffalo Lake	Marshall County (formerly SD-BS-L-SOUTH_BUFFALO_01)	Oxygen, Dissolved	2010	2	2022
SD-JA-L-TWIN_01	Twin Lakes	Sanborn County	Chlorophyll-a	2010	2	2022
SD-JA-L-WILMARTH_01	Wilmarth Lake	Aurora County	pH (high)	2012	2	2024
SD-JA-R-FIRESTEEL_01	Firesteel Creek	West Fork Firesteel Creek to mouth	Escherichia coli	2010	1	2016
SD-JA-R-FIRESTEEL_01	Firesteel Creek	West Fork Firesteel Creek to mouth	Cause Unknown (narrative standards)	2014	2	2026
SD-JA-R-FOOT_01_USGS	Foot Creek	Near Aberdeen, SD	Oxygen, Dissolved	2012	2	2016
SD-JA-R-JAMES_01	James River	North Dakota border to Mud Lake Reservoir	Oxygen, Dissolved	2012	2	2016
SD-JA-R-JAMES_03	James River	Columbia Road Reservoir	Oxygen, Dissolved	2008	2	2020
SD-JA-R-JAMES_04	James River	Columbia Road Reservoir to near US HWY 12	Oxygen, Dissolved	2012	2	2016
SD-JA-R-JAMES_05	James River	US HWY 12 to Mud Creek	Oxygen, Dissolved	2006	2	2018
SD-JA-R-JAMES_06	James River	Mud Creek to James River Diversion Dam	Oxygen, Dissolved	2010	2	2026
SD-JA-R-JAMES_07	James River	James River Diversion Dam to Huron 3rd Street Dam	Total Dissolved Solids	2014	2	2026
SD-JA-R-JAMES_07	James River	James River Diversion Dam to Huron 3rd Street Dam	Oxygen, Dissolved	2012	2	2016
SD-JA-R-JAMES_08	James River	Huron 3rd Street Dam to Sand Creek	Total Suspended Solids	2010	1	2016
SD-JA-R-JAMES_09	James River	Sand Creek to I-90	Total Suspended Solids	2004	1	2009
SD-JA-R-JAMES_10	James River	I-90 to Yankton County line	Total Suspended Solids	1998	1	2009

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-JA-R-JAMES_11	James River	Yankton County line to mouth	Total Suspended Solids	2004	1	2009
SD-JA-R-MOCCASIN_02	Moccasin Creek	James River to S24, T123N, R64W	Oxygen, Dissolved	2008	2	2020
SD-JA-R-MUD_01	Mud Creek	James River to Hwy 37	Oxygen, Dissolved	2006	2	2018
SD-JA-R-SNAKE_01	Snake Creek	James River to confluence with SF Snake Creek	Oxygen, Dissolved	2006	2	2026
SD-JA-R-TURTLE_01	Turtle Creek	James River to S17, T113N, R65W	Oxygen, Dissolved	2014	2	2026
SD-JA-R-WOLF_01	Wolf Creek	Wolf Creek Colony to S5, T103N, R56W	Escherichia coli	2012	1	2014
SD-JA-R-WOLF_02	Wolf Creek	Just above Wolf Creek Colony to the mouth.	Fecal Coliform	2014	1	2016
SD-JA-R-WOLF_02	Wolf Creek	Just above Wolf Creek Colony to the mouth.	Escherichia coli	2012	1	2014
SD-LM-R-LITTLE_MISSOURI_01	Little Missouri River	Montana border to North Dakota border	Total Suspended Solids	2010	1	2016
SD-MI-L-ANDES_01	Lake Andes	Charles Mix County	Oxygen, Dissolved	2006	2	2011
SD-MI-L-CAMPBELL_01	Lake Campbell	Campbell County	pH (high)	2010	2	2022
SD-MI-L-DANTE_01	Dante Lake	Charles Mix County	Temperature, water	2014	2	2026
SD-MI-L-HIDDENWOOD_01	Lake Hiddenwood	Walworth County	Oxygen, Dissolved	2012	2	2024
SD-MI-L-HURLEY_01	Lake Hurley	Potter County	Mercury in fish tissue	2006	2	2016
SD-MI-L-MCCOOK_01	McCook Lake	Union County	Temperature, water	2010	2	2022
SD-MI-L-POCASSE_01	Lake Pocasse	Campbell County	Chlorophyll-a	2010	2	2022
SD-MI-L-ROOSEVELT_01	Roosevelt Lake	Tripp County	Mercury in fish tissue	2006	2	2016
SD-MI-R-SHARPE_01	Missouri River (Lake Sharpe)	Oahe Dam to Big Bend Dam	Temperature, water	2010	1	2016
SD-MI-R-SPRING_01	Spring Creek	Lake Pocasse to US HWY 83	Oxygen, Dissolved	2006	2	2018
SD-MN-L-BIG_STONE_01	Big Stone Lake	Roberts County	Temperature, water	2012	2	2024
SD-MN-L-HENDRICKS_01	Lake Hendricks	Brookings County	pH (high)	2010	2	2022
SD-MN-L-PUNISHED_WOMAN_01	Punished Woman Lake	Codington County	pH (high)	2012	2	2024
SD-MN-R-LITTLE_MINNESOTA_02	Little Minnesota River	S24, T126N, R51W to S15, T128N, R52W	Oxygen, Dissolved	2012	2	2024
SD-MN-R-MUD_01	Mud Creek	SF Yellowbank River to S22, T118N, R48W	Oxygen, Dissolved	2012	2	2022

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-MN-R-WHETSTONE_S_FORK_01	South Fork Whetstone River	Headwaters to Lake Farley	Escherichia coli	2012	1	2014
SD-MN-R-WHETSTONE_S_FORK_02	South Fork Whetstone River	Lake Farley to mouth	Escherichia coli	2012	1	2014
SD-MN-R-YELLOW_BANK_N_FORK_01	North Fork Yellow Bank River	SD/MN border to S27, T120N, R48W	Escherichia coli	2012	1	2014
SD-MN-R-YELLOW_BANK_S_FORK_01	South Fork Yellow Bank River	SD/MN border to S33, T118N, R49W	Escherichia coli	2012	1	2014
SD-MU-L-COAL_SPRINGS_01	Coal Springs Reservoir	Perkins County	pH (high)	2012	D**	
SD-MU-L-COAL_SPRINGS_01	Coal Springs Reservoir	Perkins County	Mercury in fish tissue	2012	D**	
SD-MU-R-MOREAU_01	Moreau River	North and South Forks to Ziebach/Perkins county line	Total Suspended Solids	2006	D**	
SD-MU-R-MOREAU_01	Moreau River	North and South Forks to Ziebach/Perkins county line	Salinity (SAR)	1998	D**	
SD-MU-R-MOREAU_02	Moreau River	Ziebach/Perkins county line to Green Grass	Total Suspended Solids	1998	D**	
SD-MU-R-MOREAU_02	Moreau River	Ziebach/Perkins county line to Green Grass	Salinity (SAR)	1998	D**	
SD-MU-R-MOREAU_03	Moreau River	Green Grass to mouth	Total Suspended Solids	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	Total Dissolved Solids	2004	D**	
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	Alkali Creek to mouth	Specific Conductance	1998	D**	
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	Alkali Creek to mouth	Salinity (SAR)	2014	D**	
SD-NI-L-RAHN_01	Rahn Lake	Tripp County	Chlorophyll-a	2010	2	2022
SD-VM-L-E_VERMILLION_01	East Vermillion Lake	McCook County	Temperature, water	2012	2	2024
SD-VM-L-E_VERMILLION_01	East Vermillion Lake	McCook County	Chlorophyll-a	2010	2	2022
SD-VM-L-SILVER_01	Silver Lake	Hutchinson County	pH (high)	2010	2	2022
SD-VM-L-THOMPSON_01	Lake Thompson	Kingsbury County	Chlorophyll-a	2014	2	2026
SD-VM-R-LONG_01	Long Creek	Vermillion River to Highway 44	Fecal Coliform	2008	1	2010

AUID	Name	Location	Cause	Cycle First Listed	TMDL Priority	TMDL Schedule
SD-VM-R-LONG_01	Long Creek	Vermillion River to Highway 44	Escherichia coli	2010	1	2016
SD-VM-R-VERMILLION_03	Vermillion River	Baptist Creek to mouth	Escherichia coli	2014	2	2026
SD-VM-R-VERMILLION_E_FORK_02	East Fork Vermillion River	Little Vermillion River to mouth	Escherichia coli	2010	1	2016
SD-VM-R-VERMILLION_WEST_FORK_01_USGS	West Fork Vermillion River	Vermillion River to McCook-Miner County Line	Fecal Coliform	2010	1	2016
SD-VM-R-VERMILLION_WEST_FORK_ 01_USGS	West Fork Vermillion River	Vermillion River to McCook-Miner County Line	Escherichia coli	2010	1	2016
SD-WH-L-ALLAN_DAM_01	Allan Dam	Bennett County	pH (high)	2014	2	2026
SD-WH-R-LITTLE_WHITE_01	Little White River	Rosebud Creek to mouth	Fecal Coliform	2010	2	2022
SD-WH-R-LITTLE_WHITE_01	Little White River	Rosebud Creek to mouth	Escherichia coli	2012	2	2024
SD-WH-R-WHITE_01	White River	NE/SD border to Willow Creek	Fecal Coliform	2010	2	2022
SD-WH-R-WHITE_01	White River	NE/SD border to Willow Creek	Escherichia coli	2010	2	2022
SD-WH-R-WHITE_02	White River	Willow Creek to Pass Creek	Salinity (SAR)	2010	2	2022
SD-WH-R-WHITE_02	White River	Willow Creek to Pass Creek	Fecal Coliform	2004	2	2011
SD-WH-R-WHITE_02	White River	Willow Creek to Pass Creek	Escherichia coli	2010	2	2022
SD-WH-R-WHITE_03	White River	Pass Creek to Little White River	Salinity (SAR)	2010	2	2022
SD-WH-R-WHITE_03	White River	Pass Creek to Little White River	Fecal Coliform	2004	2	2022
SD-WH-R-WHITE_03	White River	Pass Creek to Little White River	Escherichia coli	2012	2	2014
SD-WH-R-WHITE_04	White River	Little White River to confluence with Missouri River	Fecal Coliform	2004	2	2026
SD-WH-R-WHITE_04	White River	Little White River to confluence with Missouri River	Escherichia coli	2010	2	2026

APPENDIX E

PUBLIC COMMENTS

Comments from the United States Environmental 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

Ref: 8EPR-EP

FEB 26 2014

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

Re: 2014 South Dakota Integrated Report

Dear Ms. Minerich:

We have reviewed the Department's draft 2014 Integrated Report (IR) for Surface Water Quality Assessment and appreciate the opportunity to provide feedback. The Department's draft IR is well organized, and we commend your efforts to utilize common sense language when possible. We also want to recognize The Department's efforts to begin implementation of a new assessment methodology for nutrient-related narrative standards. We look forward to working with The Department in this endeavor. 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 2014 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 2014 Integrated Report.

Sincerely,

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

Attachment

Attachment

Comments on South Dakota's 2014 Draft Integrated Report

Pages 23-33, New Assessment Methodology for Nutrient-Related Narrative Standards (for Streams and Lakes):

EPA supports South Dakota Department of Environment and Natural Resources (DENR)'s efforts to take initial steps to establish a narrative nutrient assessment methodology for streams and lakes beginning with the 2014 Integrated Report (IR) cycle. We understand that implementation of this assessment approach will take time, and refinement of the approach will span IR cycles in the future. The comments below are changes EPA requests DENR to consider before finalizing the 2014 Final Integrated Report (IR). In addition, we look forward to working closely with DENR and early in the IR development process to make additional refinements prior to 2016. Suggested modifications for future reports are included at the end of this section.

Recommended Changes for New Assessment Methodology in 2014 Final Integrated Report:

-EPA recommends that DENR further clarify that for the 2014 IR cycle, the new Assessment Methodology for Nutrient-Related Narrative Standards represents an initial effort to screen for clearly impaired waterbodies impacted by nutrients. This initial screening effort focuses on identifying waterbodies that clearly do not meet all designated uses as a result of this nutrient impairment analysis. It would be premature to consider waters that meet the thresholds identified in this process as "fully supporting" their uses for nutrients. EPA anticipates that further refinement of this new assessment methodology will result in more protective thresholds, and ultimately, determination of use support status in future IR cycles.

DENR Response:

DENR acknowledges that the new assessment methodologies/thresholds represent initial efforts to evaluate potential nutrient impacts to assessed waterbodies. The methodologies/thresholds are subject to refinement as new information is gained. DENR intends to re-evaluate the new assessment methodologies/thresholds in the interim of the 2016 reporting cycle and make necessary adjustments with input from EPA.

-Page 27, 2nd paragraph states that for stream assessment, biological impairment was associated with the designated use (9) fish and wildlife propagation, recreation, and stock watering waters. Please clarify for both the stream and lake assessment discussions, which designated uses are being assessed through this new assessment method, and how they relate to discussed impairments.

DENR Response:

DENR has updated page 27 to indicate the biological impairment is associated with the aquatic life designated use (instead of the (9) use). For Firesteel Creek, the (4) Warmwater permanent fish life use was changed to nonsupport and the (9) use was changed to full support.

For clarification, nonsupport of streams due to nutrient-related narrative standards will be attributed to the aquatic life designated use (2, 3, 4, 5, or 6) because the methodology assesses the biological integrity of aquatic communities.

The nutrient-related narratives standards being evaluated (74:51:01:05, 74:51:01:06, 74:51:01:08, 74:51:01:09, and 74:51:01:012) *for lakes have implications for both aquatic life and recreation uses. Therefore, support determinations for lakes evaluated for nutrient-related narratives standards were applied to the highest fishery use classification (i.e. 4, 5, 6) and both (7, 8) recreation uses. This language was inserted on page 32 (last paragraph) in the lake assessment methodology.*

- Category 2N: EPA suggests that DENR consider using a subcategory of Category 3 (insufficient data to determine whether any designated uses are met) to track waters that may need follow-up monitoring for determining nutrient impairments, rather than using Category 2. For assessment units listed in this subcategory, EPA recommends that DENR target additional monitoring to fill these data gaps during the 2014/2015 sampling seasons, with the goal of determining impairment status for the 2016 cycle.

DENR Response:

DENR is using the user-defined Category 2N to track streams that need additional monitoring in order to make a support determination for the nutrient-related narrative criteria. DENR also monitors these streams for numeric parameters that are associated with other designated uses. In EPA's 2005 guidance, EPA defined Category 2 as "Available data and/or information indicate that some, but not all of the designated uses are supported." DENR considers Category 2N the most appropriate category because DENR uses other lines of evidence to assess other designated uses. Category 3 is not an appropriate category because DENR does have sufficient data to make determinations on other designated uses.

For clarification, and as indicated in the document, stream impairments associated with nutrient-related narrative criteria will specify the cause as unknown until a stressor analysis or TMDL identify the cause of the low IBI scores. DENR has not identified the low IBI scores as nutrient impairments.

DENR will consider collecting additional data for streams in Category 2N as time and resources allow with the goal of determining support status for most streams by the 2016 IR cycle.

Lakes with insufficient data to evaluate nutrient narrative standards were not placed in user defined category 2N. DENR uses a random sampling design to obtain lake data which does not allow for significant targeting. DENR does not currently have a strategy for sampling lakes with insufficient data (n=32) to address nutrient-related narrative standards. Beneficial use support for those lakes will be determined based on numeric standards until sufficient data is obtained to evaluate nutrient-related narrative standards. DENR will evaluate the methodology in the interim of the 2016 reporting cycle to address a host of EPA concerns including targeting additional monitoring.

e) TMDL Targets: While EPA supports DENR's efforts to develop an assessment method for identifying nutrient impaired waters, we want to emphasize that the thresholds used for listing purposes should be evaluated closely (not used) as TMDL targets. As noted in the IR, DENR selected these thresholds as a first step to make progress on addressing nutrient related problems. The CWA requires that TMDL targets be established to protect the designated use. In many cases, this may involve selecting more protective targets than the listing thresholds identified for lakes and streams. As those targets are developed, DENR may wish to consider using them to update their listing methodology.

DENR Response:

DENR considers waterbodies listed as impaired for nutrient-related narrative standards based on 2014 IR criteria a low priority for TMDL development. DENR has no intentions of writing TMDLs to

any target other than the listing target that originally defined the impairment, unless dictated otherwise through special circumstances. DENR will discuss impairment thresholds and TMDL targets with EPA in the interim of the 2016 reporting cycle. When both agencies agree the thresholds are protective of the designated uses, forward progress can be made towards TMDL development.

-Page 30, Table 9: Nutrient Eco-region Specific Targets. The IV Grass Plains (Natural) Nutrient Eco-region seems to be mislabeled. The selected thresholds (which are referenced from the Herlihy Paper Feb 2013, Tables 5, 6 & 7) used in Table 9 for NLA Reference 75th for chlorophyll-a, total nitrogen and total phosphorus, are from the Grass Plains (Manmade) Nutrient Eco-region, not the Grass Plains (Natural) Eco-region. Please correct Table 9 and replace Grass Plains (Natural) with Grass Plains (Manmade).

DENR Response:

Table 9 has been corrected to reflect the appropriate label for IV. Grass Plains (Manmade) in the final IR document.

-The Assessment Methodology for Nutrient-Related Narrative Standards section seems to be missing information on waterbodies assessed for nutrient impairment. Specifically, EPA suggests that DENR add in a table each for streams and lakes assessed for nutrient impairment that clearly identifies which Assessment Unit's (AU's) were assessed (include waterbody name and ID), and the category determination. DENR describes the aggregated results for stream assessment at the bottom of page 26, please also provide aggregated results for lakes assessed in the Lake Assessment Methodology for Nutrient-Related Narrative Standards section (starts on page 30).

EPA also suggests that DENR expand their coverage of these assessed waterbodies in the Basin Narrative Sections. For example, the James River Basin narrative does discuss several streams assessed for nutrient impairment using the new methodology. Please discuss all waterbodies (lakes and streams) assessed for nutrient impairments in the Basin Narrative Sections (include screening process, if all needed data was available, category determination, etc). Providing more detail of this assessment process and initial screening results in both the Assessment Methodology section as well as the Basin Narrative sections, will add needed transparency for this new approach in 2014.

DENR Response:

DENR uses all available data in accordance with assessment methodologies (numeric and narrative) to make support and impairment decisions for all Assessment Units (AU's). The results for each AU are reflected in the basin tables through beneficial use support and category determination. In instances where data is deemed insufficient to address narrative nutrient-related standards, the support determinations and impairment decisions are based on an evaluation of numeric criteria. DENR is reluctant to provide a table depicting analysis results specific to nutrient-relative narrative standards because it is only one component of the overall assessment. While analysis results would provide transparency, the information documented in the basin tables provides a clear identification of the overall support and impairment status of each AU based on available data. DENR did provide an aggregate description of the results for lakes assessed in accordance with the Lake Assessment Methodology for Nutrient-Related Narrative Standards under Table 11 on page 32.

Providing detailed descriptions of results for all lakes assessed for nutrient-related impairment in the basin narratives would be cumbersome due to the volume of lakes assessed and the

complexity of the screening process. DENR uses the basin narratives to report general information and/or significant events for individual waterbodies within a respective basin. DENR made the decision to include stream nutrient-related results based on the relatively small number of streams assessed (n=11) in comparison to lakes (n=98). In addition, assessing streams for nutrient-related impacts has never been a component of any reporting cycle, contrary to lakes. DENR does not provide individual waterbody assessment results for numeric criteria in the basin narratives, as aforementioned; the endpoints are reflected in the basin tables through beneficial use support and category determination.

Proposed 2014 Delistings Related to Nutrients:

For the 2014 IR cycle, more information is needed to thoroughly assess *Wilmarth Lake* (SD-JA-L-WILMARTH_01), *Lake Campbell* (SD-MI-L-CAMPBELL_01) and *Cottonwood Lake* (SD-MI-L-COTTONWOOD_01), therefore EPA recommends that DENR place Wilmarth Lake, Lake Campbell and Cottonwood Lake into Category 3, "Insufficient data to determine whether any designated uses are met". This will allow for DENR to obtain more recent reference site information and refine the thresholds for chlorophyll-a, Total Phosphorus and Total Nitrogen (revisit in the 2016 IR Cycle). It is anticipated that the 2008/2009 National Rivers and Streams Assessment final report and the 2012 National Lakes Assessment final report will be available soon and should provide more representative reference site information for South Dakota's eco-regions. DENR should also receive results from their paleolimnological study of natural lakes in South Dakota, which can also be incorporated into this new assessment methodology.

DENR Response:

Based on EPA's recommendation, DENR has changed the support status for the associated beneficial uses to "insufficient." As a result, Cottonwood Lake is now in Category 3, and Wilmarth and Campbell Lakes are in Category 5 (due to pH).

Suggestions for DENR to Consider for the 2016 IR:

As noted previously, we recognize that refinement of the nutrient assessment approach will take time and effort. The suggestions outlined below are intended to assist you in your efforts to refine this process as new information becomes available. We look forward to working with DENR early in this endeavor, and anticipate thoughtful discussions as DENR refines this new methodology.

a) Threshold Development:
EPA looks forward to working closely with DENR to refine and improve the assessment thresholds used to interpret the narrative standard. For 2016, we hope to partner with DENR to develop thresholds that reflect both impaired conditions and unimpaired conditions using the approaches outlined below.

- Reference Site Quality: For the 2014 Assessment Method, DENR selected reference based values derived from EPA's national survey datasets as the thresholds. Moving forward, EPA sees several opportunities to improve this process in the future. For example, if DENR plans to continue to establish nutrient thresholds based on a reference distribution, we would encourage DENR to evaluate the level of disturbance at reference sites. Nutrient concentrations from reference sites in highly disturbed areas often reflect best attainable conditions instead of minimally disturbed conditions. EPA looks forward to collaborating with DENR to develop a documented process for screening reference sites and determining which sites truly reflect minimally disturbed conditions. In the future, DENR may want to consider applying its own reference screening process to sites sampled through EPA's national surveys and/or use SD reference site data. As referenced in the 2014 draft IR, DENR could include the anticipated new paleolimnological data for natural lakes in the 2016 IR.

- Literature values and consideration of stressor/response studies: Another option DENR may want to consider is to establish impairment thresholds associated with impacts to designated uses based on literature values and identify full support thresholds based on a protective approach. EPA would encourage DENR to review the literature values relevant to their area including nutrient dose-response studies and/or other published journal articles documenting the levels at which nutrients are associated with an aquatic life response. EPA can assist DENR with obtaining this information if needed.

b) Statistical Analyses: Given the thresholds selected, EPA would encourage DENR to consider a more protective statistical method than comparing average concentrations to the threshold value. EPA views narrative criteria to function as a not-to-exceed condition without numeric values. So any metric interpreting compliance with such a narrative should use conservative statistical analyses. This concept is particularly relevant if DENR continues to rely on national survey reference values because the values identified as the 75% of reference are based on single sample values, not an average or median concentration from a particular site. For example, an assessment method that allows only a single sample exceedence of the national survey data would be more aligned with the derivation of the national survey thresholds. Another option example would be to apply a 10% exceedence frequency, similar to DENR's current approach for conventional parameters.

c) Response Indicators:

- EPA recognizes DENR's interest in developing an assessment method that relies on response indicators. However, since fish and macroinvertebrates are indirect indicators for nutrient enrichment, we would encourage DENR to consider other indicators as well (e.g., chlorophyll-a data, photos, periphyton information, DO flux, pH data).

- EPA would encourage DENR to consider modifying their stream approach to parallel the lake method that considers multiple lines of evidence. In the lake methodology, impairment decisions are based on whether several or more indicators are exceeded. In contrast, the stream approach requires exceedances of the nutrient thresholds and demonstrated biological impacts. DENR could construct a stream matrix, similar to the lake matrix, that allows consideration of multiple indicators (both causal and response) and does not follow a straight linear approach.

-On page 31, paragraph 3, please correct the following sentence: "A chlorophyll-a threshold of ~~10 µg/ml~~ 10 µg/L was used for waterbodies with the beneficial use of Domestic Water Supply waters consistent with EPA's 2010 ~~criterion~~ thresholds."

DENR Response:

DENR acknowledges that EPA has considerable issues with the assessment methodologies and associated thresholds used to evaluate nutrient-related narrative standards. DENR would normally provide EPA adequate time to review and comment on new or proposed assessment methodologies prior to application in a subsequent reporting cycle. This format was not followed during the 2014 reporting cycle as urgency to produce an assessment methodology to evaluate nutrient-related narrative standards was not recognized until the release of EPA's 2014 IR guidance memo in September 2013. The 2014 IR memo specifically recommends that states without formal numeric nutrient standards develop assessment methodologies to evaluate nutrient-related narrative standards to make designated use support determinations.

DENR did not have formal plans to develop a nutrient-related assessment methodology for the 2014 reporting cycle. DENR was in the process of building assessment tools required to develop methodologies to evaluate nutrients as part of the 303(d) process. Results of efforts associated with lake paleolimnological studies and stream bioassessment were either not available or released late in the 2014 IR drafting process. The 2014 IR memo insinuated that if states failed to develop and apply assessment methodologies to available data, EPA would intervene, similar to that demonstrated in the 2010 IR when EPA listed 12 lakes for chlorophyll-a. To avoid this scenario, DENR used available assessment tools and adopted impairment thresholds based on the most recent, regionally-specific, and scientifically defensible literature sources available. The end product was not shared with EPA until the 2014 IR draft comment period due to time constraints that would have jeopardized the April 1, 2014 finalization deadline.

DENR reviewed each individual suggestion provided by EPA with regards to future refinement of the current nutrient-related assessment methodologies. A response to each individual suggestion was not provided to avoid using the IR comment section as the forum to discuss future actions. DENR is more than willing to have constructive discussions with EPA in the interim of the 2016 reporting cycle to communicate future intentions, refinement processes, and gain resolve with respect to impairment thresholds, statistical approaches, and response indicators outlined above.

The recommended corrections were made to the sentence in paragraph 3 on page 31. The corrections are reflected in the 2014 IR final report.

Other Comments on Draft 2014 I.R:

-Grand and Moreau River Basins: EPA has begun a region-wide effort to refine our understanding of Indian Country waters so that we can work with states and tribes to proactively identify potential jurisdictional issues and foster communication among affected parties. By better understanding these jurisdictional issues, EPA will work with its state and tribal partners to create an appropriate approach to addressing these unique waters. EPA Region 8 will continue its discussions with DENR to understand the jurisdictional issues specific to South Dakota, and formulate an approach for these waters. As DENR mentions in its draft IR, the Grand and Moreau River Basins do contain such waters, and in some cases these waters have been identified as impaired by DENR. For the 2014 IR cycle, EPA suggests the following revisions:

> -Page 94, Grand River Basin: EPA suggests that DENR revise the last paragraph to read: "DENR continues discussions with EPA to determine next steps regarding TMDL development and prioritization for The Grand River Basin, since these waters are affected by unique jurisdictional issues."
>
> -Page 126, Moreau River Basin: EPA suggests that DENR revise the last paragraph to read:
> "DENR continues discussions with EPA to determine next steps regarding TMDL development and prioritization for The Moreau River Basin, since these waters are affected by unique jurisdictional issues."

> -Page 17, Table 5: Status of TMDLs from 2012 Integrated Report: EPA recommends that DENR revise the TMDL status "Deferred to EPA", to read "In Discussions with EPA", please also revise the third bullet above Table 5 to read the same language. EPA recommends that DENR revise the Figure 1 Pie Chart section to read "In Discussions with EPA" rather than "Deferred to EPA".
>
> -Pages 57-142: River Basin Information Tables: EPA suggests that DENR revise the basin table keys for "D**" to read "In Discussions with EPA", rather than "TMDL development deferred to EPA".

DENR Response:

DENR would like to provide clarification regarding the decision to defer TMDL development for impaired waters in the Grand and Moreau River basins to EPA. The primary reason for this deferral action was based on TMDL pace (WQ-8) commitments. In 2008, EPA made it clear that TMDL pace measures were a priority and states were expected to meet annual TMDL pace targets. DENR formulated a plan to prioritize and direct limited resources towards meeting the targets. TMDL development and reporting focused strictly on waterbodies with good data availability, local support, and low complexity. In order to implement this strategy, TMDL development would not be conducted on impaired waterbodies that did not meet the criteria, in particular, those located in the Grand and Moreau River basins.

DENR notified EPA Region 8 in a letter dated August 22, 2008 (below) that the agency would not be completing any TMDLs in the Grand and Moreau River basins, thereby deferring TMDL development in both basins to EPA. The letter described and documented the extent and timeframe of multiple listings within both basins. The letter also described DENR's intent to remove the listed segments/parameters from the WQ-8 TMDL pace commitment. The main purpose of this action was to facilitate DENR's ability to meet TMDL pace targets.

DENR acknowledges that the tribal jurisdiction issues must be addressed to move forward with TMDL development and prioritization in the Grand and Moreau River basins. Therefore, DENR revised the language in the last paragraphs of the Grand and Moreau River basin narratives in accordance with EPA's recommendation. DENR also made EPA's recommended changes to Table 5 and the basin tables changing "Deferred to EPA" to now read "In Discussions with EPA." All changes were incorporated into the 2014 IR final document.

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

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 35, Table 13: 2014 Category Status for Lakes in South Dakota vs 2012. There appears to be a large increase in the number of Category 5 lake acres between 2012 (46,507.91) and 2014 (74,737.16). Please provide some narrative to account for both the increase in impaired lake acres as well as the decrease of unimpaired lake acres in Category 1. For example, if this categorical change can be attributed to new assessment methods or more recent monitoring data, please include an appropriate explanation for these changes.

DENR Response:

The increase in Category 5 lake acreage and resulting decrease in Category 1 acreage is due to several reasons. It is not attributed to a single factor, such as new assessment methods for assessing nutrient-related narrative standards. The most significant factor is the size of the affected lakes. DENR added thirteen new lakes to the 303(d) list in 2014. Only three of the thirteen lakes were added due to chlorophyll-a, however the size of the lakes contributed over 15,000 acres. Six lakes were added to the list due to fish consumption advisories for mercury in fish tissue. These six lakes accounted for nearly 6,000 acres. Four lakes were added for not meeting numeric criteria for dissolved oxygen, temperature, or pH, and accounted for over 4,000 acres.

-Page 46, Table 26: Possible Changes in North Temperate Lakes by Trophic State Gradient: All relevant parameters are included in this table with the exception of Total Nitrogen (TN). Recommend adding TN to the Table since it is one of the four trophic state indicators.

DENR Response:

DENR extracted Table 26 from the following website http://www.secchidipin.org/tsi.htm. The table does not include the value ranges and associated trophic state classification for nitrogen. This information is not available on the website, nor is the table formatted for editing. DENR inserted the website link underneath the table in the 2014 IR final to provide credit to the authors. The website does discuss nitrogen as a trophic state parameter based on Carlson and Simpson, (1996). The appropriate citation is documented in the References section beginning on page 168.

Page 113, Minnesota River Basin: Since DENR resegmented the Little Minnesota River from one segment to two, it would be helpful to mention this change in the Minnesota River Basin narrative section. If other resegmentations have occurred, please also add these to their respective basin narrative sections.

DENR Response:

A summary of the resegmentation of the Little Minnesota River has been included in the Minnesota River basin narrative section.

-Pages 144-46, Wetlands Section, describes estimated wetland condition in South Dakota as of 2007. Does SDDENR or another entity plan to conduct a more up to date wetlands inventory? More recent information on extent and type of wetlands present in South Dakota as well as current ecological integrity would be helpful to better understand the current condition of these valuable water resources.

DENR Response:

DENR used the most up to date information available from the U.S Fish and Wildlife Service's National Wetlands Inventory to generate estimates of wetland acreage. The department is not aware of any other agencies or entities that have conducted a more up to date inventory. Wetland acreage in South Dakota is subject to change annually depending on trends associated with federal, state, and local protection programs and demand on production agriculture. DENR does not have plans to conduct wetland condition assessments, primarily due to resource limitations.

-Page 153, Table 49: Waterbodies Affected by Fish and Shellfish Consumption Advisories: The waterbodies listed with consumption advisories for mercury do correctly match Appendix D, 303(d) Summary (cause "Mercury in fish tissue"). However, the SDDENR website seems to be missing the following waterbodies with current advisories: Swan Lake, Long Lake and Lardy Lake.

DENR Response:

Thank you for the comment. DENR's website has been updated to reflect all fish consumption advisories.

-Page 154, Table 51: Summary of Waterbodies Not Fully Supporting Domestic Water Supply Use: Two waterbody segments (Elm River (SD-JA-R-ELM_01), and James River (SD-JA-R-JAMES_07)) with this designation are not supporting this use due to total dissolved solids (TDS). The James River segment is no longer used as a drinking water supply, but The Elm River is still used as a drinking water supply. Please discuss the current situation with the Elm River in the James River Basin Narrative to provide more detail on this waterbody.

DENR Response:

Upon further review of the data, it appears the Elm River was listed for TDS in error. The listing in the draft report was based on the chronic TDS criterion. Further review of the data indicated that minimal data requirements were not met in some of the 30-day averages, including the 30-day average that had caused the listing in the draft report. The Elm River is fully supporting all beneficial uses and is no longer included on the 303(d) list.

-Page 166, References: It appears that one reference document is missing from the reference list. Please add to the list: EPA's National Wadeable Streams Assessment final report (Wadeable Streams Assessment: A Collaborative Survey of the Nation's Streams, December 2006).

DENR Response:

Thank you for your comment. The document has been added to the reference list.

Appendix A, Waterbodies with EPA Approved TMDLs:

-Page 171, Freeman Lake (SD-BA-L-FREEMAN_01): For completeness, EPA suggests that DENR add that the TMDL for the TDS impairment of Freeman Lake was approved by EPA on 9/26/2012. As currently written, it looks like the TDS TMDL was approved in 2001, not 2012.

-Page 173, Big Sioux River segment 13 (SD-BS-R-BIG_SIOUX_13): EPA approved the TMDL for the fecal coliform impairment of this waterbody in 2008 as indicated, but has not approved a TMDL for the Escherichia coli (E. coli) impairment. The E. coli impairment was first listed on the 303(d) list in 2012 and according to the basin tables in the draft 2014 IR, this water body is still impaired for immersion recreation and limited contact recreation use due to elevated E. coli. Appendix A should be corrected by indicating that only a fecal coliform TMDL has been approved by EPA for this waterbody. Also, the E. coli impairment should be included on the 2014 303(d) list (Appendix D).

-Page 175, Rapid Creek segments 3 and 4: EPA approved the TMDLs for the fecal coliform impairments of these 2 waterbodies in 2010 as indicated, but EPA has not approved TMDLs for E. coli impairments. Appendix A should be corrected by indicating that EPA has approved only fecal coliform TMDLs for these waterbodies. Also, according to the information in the basin tables in the draft 2014 IR, segment SD-CH-R-RAPID_04 is still impaired for immersion recreation use due to elevated E. coli and should be included on the 2014 303(d) list. It looks like segment 3 is not impaired due to elevated E. coli.

DENR Response:

Appendix A has been corrected as requested.

Appendix B, Waterbody Delisting Report:

-Page 180, Big Sioux River Segment 13 (SD-BS-R-BIG_SIOUX_13): The reason given for delisting this segment is that EPA approved or established a TMDL for this impairment E. coli. However, EPA has not approved an E. coli TMDL for this waterbody so it should not be included in the delisting report. Note that it should be included on the 2014 303(d) list (Appendix D).

DENR Response:

Appendix B has been corrected as requested.

Appendix D, 303(d) Summary:
Based on the comments above, the following waterbodies should be included on the 303(d) list:

-SD-BS-R-BIG_SIOUX_13, immersion recreation use and limited contact recreation uses are impaired due to E. coli.

-SD-CH-R-RAPID_04, immersion recreation use is impaired due to E. coli

DENR Response:

Appendix D has been corrected as requested.

-Appendix D appears to be missing the impairment cause of chlorophyll-a for four waterbodies. This cause is also missing in the ADB files for these four waterbodies. These include:

-East Oakwood Lake (SD-BS-L-E_OAKWOOD_01)
-Crestbard Lake (SD-JA-L-CRESTBARD_01)
-Lake Mitchell (SD-JA-L-MITCHELL_01)
-Lake Hiddenwood (SD-JA-L-HIDDENWOOD_01)

DENR Response:

Chlorophyll-a is not included in Appendix D because all four waterbodies have an approved nutrient TMDL.

GIS Files: In reviewing the GIS files submitted with the draft 2014 IR, it was determined that all waterbody segment categorical designations match with the exception of the following: Pipestone Creek (SD-BS-R-PIPESTONE_01) is listed in Category 5 in the Integrated Report as well as the ADB, but is listed in Category 4A in the GIS files. Please correct the GIS category designation for Pipestone Creek from Category 4A to Category 5.

DENR Response:

Pipestone Creek is correctly listed as Category 4a in the IR and ADB. However it was incorrectly listed as Category 5 in the draft GIS layer. DENR has corrected this error. Pipestone Creek should now be Category 4a in the IR, ADB, and GIS layer.

ADB Files: Page 35, Table 12 (2014 category Status for Rivers and Streams in South Dakota vs 2012) and Table 13 (2014 Category Status for Lakes in South Dakota vs 2012). In reviewing Tables 12 and 13 with a similar report generated from the 2014 ADB files, it was determined that for Categories 2-4, the Total Size (miles and acres) as well as the Number of Assessment Units do not match ADB. Please review and correct so that both ADB and the IR match for all categories.

DENR Response:

DENR has verified that Tables 12 and 13 match ADB. However, due to category changes identified in these comments, the numbers in these tables have changed from the draft to the final document.

Comments from the United States Department of Agriculture – Forest Service:

United States Department of Agriculture | Forest Service | Black Hills National Forest Supervisor's Office | 1019 N. 5th Street Custer SD 57730-8214 Tel. 605/673-9200 FAX 605/673-9350

www.fs.usda.gov/blackhills

File Code: 2530
Date: February 26, 2014

SHANNON MINERICH
DEPARTMENT OF ENVIRONMENT AND
NATURAL RESOURCES
SURFACE WATER QUALITY PROGRAM
523 E. CAPITOL AVE.
JOE FOSS BUILDING
PIERRE, SD 57501-3181

Dear Ms. Minerich:

Thank you for the opportunity to review and comment on the Draft 2014 Integrated Surface Water Quality Assessment Report. As identified in the Memorandum of Understanding between the United States Forest Service, Rocky Mountain and Northern Regions and the South Dakota Department of Environment and Natural Resources (SD DENR), the Black Hills National Forest continues to be interested in working with the State in understanding water quality issues and conserving or improving water quality on National Forest System (NFS) lands. Various personnel took the opportunity to review the draft report and would like to commend SD DENR on the information presented and the quality of the document. The Forest includes a limited number of comments on the report.

- **General Comment:** Basin narratives reviewed for the Black Hills region included a variety of information for the streams and rivers. It would be beneficial to have some similar text for the lakes in those basin narrative sections and make reference to the lake assessment sections (page numbers) located closer to the beginning of the report.

- **Pages 59-61:** Four lakes have been identified in Table 32 as being non-supportive, specifying the cause as temperature. However, there is no current source for the impairment listed. Review of the written description of the Belle Fourche basin (pages 59-60) also does not include information of the source for the impairment. Similar to other impairments for other sources for other water bodies in Table 32, it is requested that the source be identified. It is also requested that some additional text be included to clarify how the source for these temperature impairments are different than those specified as "natural sources", such as for sources currently identified for lakes in the Upper Cheyenne basin, or for Black Hills streams.

- **Page 67:** Belle Fourche River Basin Map (Figure 11) – Not able to locate L1 (Iron Creek Lake) on the map.

- **Pages 188-191:** Appendix C Map Legends – Legends are not legible on the report version available on the public notice website link.

If you have any questions or need more clarification regarding these comments, please contact Deanna Reyher by phone at (605) 673-9348 or by e-mail at dreyher@fs.fed.us.

Sincerely,

/s/ Ralph G. Adam (for)
CRAIG BOBZIEN
Forest Supervisor

DENR Response:

General Comment *– A paragraph has been added to the Cheyenne River basin narrative section describing the primary cause of impairment (temperature) for lakes.*

Pages 59 – 61 *– DENR typically does not include the source of impairment unless it has been identified though an approved TMDL or based on best professional judgment. In previous IR cycles, DENR included probable sources for many impaired waterbodies prior to TMDL development, however has moved away from that practice in recent cycles. Based on your comment, DENR has removed several sources from the final document because those sources have not yet been verified by a TMDL and DENR does not want to speculate on the source of impairment. Additionally, the source of impairment is supplemental information and is not a required element. Regarding the four lakes mentioned, DENR will include the impairment sources in the basin tables upon completion and approval of a TMDL.*

Page 67 *– The label for Iron Creek Lake has been added to Figure 11.*

Pages 188 – 191 *– The maps have been updated with larger legends.*

Comments from the Pennington County Board of Commissioners:

Pennington County Board of Commissioners

Pennington County Courthouse • 315 Saint Joseph St., Ste 156
Rapid City, SD 57701 • Phone: (605) 394-2171
www.pennco.org • commissioners@pennco.org

February 18, 2014

RECEIVED
FEB 20 2014
SURFACE WATER PROGRAM

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

RE: 2014 South Dakota Integrated Report for Surface Water Quality Assessment

Dear Ms. Minerich:

Pennington County appreciates the work that the South Dakota Department of Environment and Natural Resources did in completing the 2014 South Dakota Integrated Report for Surface Water Quality Assessment and also welcomes the opportunity to comment on the draft report.

Pennington County's comments are as follows:

The current Spring Creek Watershed Management and Project Implementation Plan's strategy is to implement best management practices within the watershed to bring the creek back into compliance with its assigned beneficial uses. These best management practices include livestock and manure management, riparian buffers, streambank stabilization, stormwater runoff and detention, grazing and forest management, stream and lake habitat improvements, and onsite wastewater treatment system improvements.

At this time, we feel that the current Spring Creek Watershed Management and Project Implementation Plan includes best management practices that address the additional impairments of E. *coli* and total suspended solids on Spring Creek. The riparian and stormwater best management practices can reduce sediment levels, in addition to bacteria levels, in Spring Creek.

Thank you for the opportunity to review and comment on the 2014 South Dakota Integrated Report for Surface Water Quality Assessment. Pennington County and our partners will continue through the Spring Creek Watershed Management and Implementation Project to monitor and work to restore the beneficial uses on Spring Creek.

Sincerely,
The Pennington County Board of Commissioiners

Lyndell Petersen

Lyndell Petersen, Chairman
Pennington County Board of Commissioners

LP\bm

DENR Response:

Thank you for your comments. DENR appreciates the work that Pennington County is doing in the Spring Creek Watershed and commends your commitment to environmental health and water quality restoration.

Comments from East Dakota Water Development District:

East Dakota Water Development District
132B Airport Avenue
Brookings, SD 57006

605-688-6741 605-688-6744 Fax

March 10, 2014

Shannon Minerich
SD DENR - Surface Water Quality Program
523 east Capitol Avenue
Pierre, South Dakota 57501-3181

Dear Ms. Minerich:

I am writing to offer comments and questions on behalf of the East Dakota Water Development District on the DRAFT 2014 South Dakota Integrated Report for Surface Water Quality Assessment. For each I have included a page reference from the DRAFT document.

1. Page 1, seventh paragraph. This is mostly a self-serving observation, but listed here are various public entities that have contributed data to this report. Absent is reference to the East Dakota Water Development District, which has also provided data to this effort.

2. Page 5, second paragraph. Reference is made to the fact that the last triennial review of the South Dakota water quality standards was completed by the South Dakota Water Management Board on March 11, 2009, and approved by the United States Environmental Protection Agency (USEPA), August 19th of that same year (i.e., five years ago). What is the reason for this delay in what is a critical and important process?

3. Pages 23-27. In the text describing the "Stream Assessment Methodology for Nutrient-Related Narrative Standards," reference is made to both nitrogen and phosphorus in a general sense. There are also references made to certain specific forms in which these elements could occur and be measured (nitrate-nitrate, ammonia, total nitrogen, total phosphorus). It is at times unclear as to which of the particular specific or generic forms are being referenced, particularly with regard to the index of biotic integrity (IBI) relationships. This should be clarified.

4. Page 68, last paragraph. The paragraph identifies the primary causes of non-support for Big Sioux River basin streams, and lists sources as "runoff from livestock operations, wet weather discharges and storm sewers within municipal areas, and wildlife." Bacteria, measured either as fecal coliform bacteria or *E. Coli*, can and does come from a range of sources. The implication here is that the three listed sources are those responsible for the impairments noted in the report. I would strongly suggest that wildlife be removed. Table 33 lists the likely source(s) of recognized impairments. While livestock and municipal sources are listed, wildlife are not cited. I would not argue that a minor portion

of the bacterial load measured originates from wildlife, but there is no demonstrable evidence to suggest that this particular source is responsible for recognized impairments.

5. Page 69, first paragraph. It is stated that "Lakes in the Big Sioux River basin are highly productive due to algae, nutrient enrichment, and siltation." The presence of significant amounts of algae in these lakes is a symptom of the high productivity noted, but it is not a cause. Loadings of nutrients and sediment are the causes of the productivity. Please strike the reference to algae in the first sentence.

6. Page 69, first paragraph. It is stated that "Lakes are susceptible to rapid changes produced by large nutrient and sediment loads from sizeable agricultural watersheds comprised of nutrient-rich glacial soils." I read this sentence to imply that the problematic nutrients that enter our lakes are from native soils, which presumably contain naturally high levels of nutrients. While I do not doubt that native nitrogen and phosphorus in the soils make a minor contribution, the excess nutrients that are adversely impacting our lakes come from fertilizers and other amendments that are applied to the agricultural fields in the watershed. The text should be corrected to reflect the actual source(s) of these nutrients.

7. Pages 70 & 73. Bullhead Lake is listed as US EPA Category 5 (water is impaired or threatened and a TMDL is needed). School Lake is listed as US EPA Category 1 (all designated uses are met). An asterisk (*) follows the number for School Lake, indicating that this water body has an US EPA-approved TMDL. District staff were responsible for the watershed assessment for these lakes, along with the preparation of the TMDL reports for the impairments identified at the time for both lakes, trophic state index (TSI) and pH. Although TSI has since been dropped as a tool for lake assessment, pH remains as a numeric standard used to assess lake condition. Question: If the School Lake pH TMDL has been accepted, as indicated here, why has the pH TMDL for Bullhead Lake not yet been recognized/acknowledged?

Thank you for your consideration of these comments. If you have any questions about the points that I have raised, please do not hesitate to contact me. I applaud the Department's work on what can only be described as a herculean effort.

Sincerely,

Jay P. Gilbertson
Manager/Treasurer

DENR Response:

1. DENR apologizes for the oversight and has added East Dakota Water Development District to the list of organizations that supplied data for the 2014 IR. Additionally, to reduce future omissions caused by errors in identifying data as being submitted by an outside organization or a DENR project sponsor, DENR has included the names of project sponsors in the report. DENR acknowledges and appreciates the contributions of outside organizations and project sponsors.

2. *DENR initiated the triennial review of water quality standards process in the fall of 2012, as required by EPA, and continues to communicate and work with EPA to address potential changes. The triennial review of water quality standards is a critical and important process. DENR is tentatively planning to offer the proposed changes for public input later this year and then present the proposed changes to the Water Management Board in the fall of 2014.*

3. *DENR has added the "total" fraction for phosphorus and nitrogen to appropriate areas of the document.*

4. *DENR agrees and has removed "wildlife" from the mentioned paragraph.*

5. *DENR agrees and has removed "algae" from the sentence in question.*

6. *DENR agrees that nutrient and sediment loads from agricultural watersheds are of greatest concern with respect to lake productivity in the Big Sioux basin. The text "nutrient-rich glacial soils" was changed to "glacial soils" in the final 2014 IR.*

7. *Bullhead Lake was fully supporting its beneficial uses when the Bullhead Lake and School Lake TMDLs were public noticed and sent to EPA for review and approval. At that time, EPA was reluctant to review and approve TMDLs for waterbodies not having impairments so the Bullhead Lake TMDL was never reviewed or approved by EPA.*

   The pH and TSI listings for Bullhead Lake occurred in the 2008 Integrated Report, after the School Lake/Bullhead Lake TMDLs were submitted to the USEPA. The TSI listing methodology was dropped but no action was taken on the Bullhead Lake 2008 (and 2010) pH listings because DENR and EPA haven't agreed on the critical threshold values for nutrients, especially chlorophyll-a, which is thought to be closely related to pH. EPA, using a weight-of-evidence approach, listed Bullhead Lake as being impaired for chlorophyll-a in the 2010 Integrated Report. In 2012, DENR delisted pH for attaining water quality standards. Bullhead Lake continues to be impaired for chlorophyll-a based on DENR's nutrient-related narrative standards.

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES

PMB 2020
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

June 24, 2013

RE: Request for Water Quality Data

Dear Interested Party:

It is time for the department to begin preparation of the 2014 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 2014 Integrated Report by August 23, 2013. South Dakota's most recent Integrated Report is available at the department's website: http://denr.sd.gov/documents/12irfinal.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

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES
JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3181
denr.sd.gov

FOR IMMEDIATE RELEASE: Monday, June 24, 2013
FOR MORE INFORMATION: Shannon Minerich, 773-3351

DENR Requests Water Quality Data for 2014 Integrated Report

PIERRE, SD – The South Dakota Department of Environment and Natural Resources requests water quality data as part of its process to complete a biennial assessment of South Dakota's lakes and streams.

The 2014 Integrated Report must be completed and submitted to the U.S. Environmental Protection Agency by April 1, 2014. The report provides an assessment of the quality of South Dakota's surface water resources and identifies the impaired waters that require a total maximum daily loads (TMDL).

A total maximum daily load calculates 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.

The department's 230-page 2012 Integrated Report can be viewed online at http://denr.sd.gov/documents/12irfinal.pdf

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 23, 2013.

Water quality data can also be sent to Shannon Minerich at:

South Dakota Department of Environment and Natural Resources
523 East Capitol Avenue
Pierre, South Dakota 57501-3182

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DEPARTMENT OF ENVIRONMENT and NATURAL RESOURCES

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

FOR IMMEDIATE RELEASE: Wednesday, January 29, 2014
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 10, 2014. Comments can be emailed to Shannon Minerich at *Shannon.Minerich@state.sd.us* , submitted online at DENR's One-Stop Public Notice page at *http://denr.sd.gov/public/default.aspx*, or submitted in writing to:

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 2014 Integrated Report is available by contacting DENR at the above address, by phone at 1-800-438-3367, or by visiting DENR's One-Stop Public Notice page at: *http://denr.sd.gov/public/default.aspx*.

The draft 2014 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 2014 report lists 167 waterbodies or waterbody segments needing a total maximum daily load. Of those listed, 94 (or 56%) are stream and river segments and 73 (or 44%) are lakes that periodically do not meet water quality standards.

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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 2012, 31 total maximum daily loads have been completed or determined to be unnecessary, 82 are in progress, and 65 are planned.

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NOTICE OF THE 2014 SOUTH DAKOTA INTEGRATED REPORT FOR SURFACE WATER QUALITY ASSESSMENT AND OPPORTUNITY FOR COMMENT

The Department of Environment and Natural Resources (DENR) is announcing the availability of the draft 2014 South Dakota Integrated Report for Surface Water Quality Assessment (Integrated Report) and the opportunity for public comment on the draft report.

The Integrated Report is required under the federal Clean Water Act. This report combines the 305(b) Water Quality Report to Congress and the 303(d) Impaired Waterbodies list into one document for the purpose of reporting on South Dakota's surface water quality. The Integrated Report also lists those waterbodies that require the completion of a Total Maximum Daily Load (TMDL). This final Integrated Report must be submitted to the U.S. Environmental Protection Agency (EPA) on or before April 1, 2014.

The 2014 Integrated Report contains the following information:
1. An assessment of the surface water quality of South Dakota's waters;
2. A description of South Dakota's water quality monitoring programs;
3. Pollutants causing or expected to cause violations of the applicable water quality standards; and
4. Identification of waters targeted for TMDL development.

The department is providing a public participation process in which the members of the general public, affected organizations, and other interested parties can review and comment on the content of the draft 2014 Integrated Report. A copy of the draft 2014 Integrated Report is available on DENR's One-Stop Public Notice page at: http://denr.sd.gov/public/default.aspx. Copies of the draft may also be obtained by writing to Shannon Minerich at the address below, emailing Shannon.Minerich@state.sd.us, or by calling her at 1-800-438-3367.

Any person desiring to comment on the report should submit comments by email to Shannon.Minerich@state.sd.us or online at DENR's One-Stop Public Notice page. Comments may also be submitted in writing to the address below. The department must receive public comments by March 10, 2014.

At the conclusion of the public comment period, the department will prepare a written response to each comment received and post the response to the department web site or, if requested, by written response to each person who provided comments or requested a copy of the department's response.

The department will finalize the 2014 Integrated Report after consideration of the comments received during the public participation process. The final 2014 Integrated Report will then be sent to EPA for approval. Once EPA approves the list, the Integrated Report will be made available on the department's website and will be sent to persons who request a copy. Published at the approximate cost of _____.

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

Steven M. Pirner
Secretary