THE 2022 SOUTH DAKOTA INTEGRATED REPORT FOR SURFACE WATER QUALITY ASSESSMENT

Protecting South Dakota's Tomorrow...Today

Prepared By
SOUTH DAKOTA DEPARTMENT OF AGRICULTURE AND NATURAL RESOURCES

HUNTER ROBERTS, SECRETARY

DEPARTMENT of AGRICULTURE and NATURAL RESOURCES
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March 25, 2022

Kathleen Becker, Regional Administrator
U.S. Environmental Protection Agency, Region 8
1595 Wynkoop Street
Denver, CO. 80202-1129

Re: Final 2022 South Dakota Integrated Report

Dear Mrs. Becker:

I am pleased to submit to you the 2022 South Dakota Integrated Report, with supporting information, as required under Sections 305(b) and 303(d) of the Clean Water Act.

This submittal represents a major effort by this department as well as interested members of the South Dakota public. The 2022 report is one of the most comprehensive reviews of water quality data completed in South Dakota to date.

The report and supporting information were uploaded to EPA's ATTAINS system on March 25, 2022. An electronic copy of the report is also available via our homepage at: https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/SDDANR_2022_IR_final_submitted.pdf.

We look forward to your agency's full approval of our 2022 Integrated Report. We also want to thank you and your staff for assistance during the development process.

Sincerely,

Hunter Roberts
Secretary

Cc: Elizabeth Rogers
Darcy O'Connor

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8
1595 Wynkoop Street
Denver, CO 80202-1129
Phone 800-227-8917
www.epa.gov/region8

April 11, 2022

Ref: 8WD-CWB

SENT VIA EMAIL

Hunter Roberts, Secretary
South Dakota Department of Agriculture and Natural Resources
hunter.roberts@state.sd.us

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

Dear Mr. Roberts:

Thank you for your submittal of the South Dakota Department of Agriculture and Natural Resources (DANR) 2022 Water Quality Integrated Report received March 25, 2022. The Environmental Protection Agency Region 8 (EPA) has conducted a complete review of the Clean Water Act (CWA) Section 303(d) waterbody list (Section 303(d) list) and supporting documentation and information. EPA has determined that South Dakota's 2022 CWA Section 303(d) list meets the requirements of Section 303(d) of the Clean Water Act (CWA) and EPA's implementing regulations found at 40 C.F.R. Part 130 and approves South Dakota's 2022 CWA Section 303(d) list.

EPA's approval of South Dakota's submitted 2022 Integrated Report/Clean Water Act Section 303(d) List does not extend to Indian country as defined in 18 U.S.C. Section 1151. Indian country in South Dakota generally includes (1) lands within the exterior boundaries of the following Indian reservations located within South Dakota: the Cheyenne River Reservation, the Crow Creek Reservation, the Flandreau Indian Reservation, the Lower Brule Reservation, the Pine Ridge Reservation, the Rosebud Indian Reservation, the Standing Rock Reservation, and the Yankton Reservation (subject to federal court decisions removing lands from Indian country status within the Yankton Reservation); (2) any land held in trust by the United States for an Indian tribe (including but not limited to the Sisseton-Wahpeton Oyate Tribe); and (3) any other areas that are "Indian country" within the meaning of 18 U.S.C. Section 1151. The EPA, or eligible Indian tribes, as appropriate, will retain responsibilities under CWA Section 303 for waters in Indian country. Today's action is not intended as an action to approve or disapprove an impaired waters list for waters within Indian country.

The attachment describes the statutory and regulatory requirements of the CWA Section 303(d) list and a summary of EPA's review of South Dakota's compliance with each requirement. EPA appreciates your work to produce South Dakota's 2022 CWA Section 303(d) list.

If you have any questions, the most knowledgeable EPA staff person is Liz Rogers and she may be reached at (303) 312-6974 or rogers.liz@epa.gov.

Sincerely,

Judy Bloom, Manager
Clean Water Branch

Attachment

cc: Shannon Minerich, SDDANR
Paul Lorenzen, SDDANR
Liz Rogers, EPA, 8-CWB

Review of South Dakota's 2022 Section 303(d) Waterbody List

Attachment to letter from Judy Bloom, Branch Manager, Clean Water Branch, Water Division, US EPA, Region 8 to Hunter Roberts Secretary, South Dakota Department of Agriculture and Natural Resources

Date of Submission to and Receipt by EPA: March 25, 2022

I. Introduction

The South Dakota Department of Agriculture and Natural Resources (DANR) submitted its final 2022 Integrated Report (IR) to the Environmental Protection Agency (EPA) on March 25, 2022. Based on our review of the State's Clean Water Act (CWA) Section 303(d) water body list ("Section 303(d) list"), EPA is approving South Dakota's 2022 Section 303(d) list in its entirety. The purpose of this review document is to describe the rationale for EPA's approval.

EPA's approval of South Dakota's 2022 Integrated Report/Clean Water Act Section 303(d) List does not extend to Indian country as defined in 18 U.S.C. Section 1151. Indian country in South Dakota generally includes (1) lands within the exterior boundaries of the following Indian reservations located within South Dakota: the Cheyenne River Reservation, the Crow Creek Reservation, the Flandreau Indian Reservation, the Lower Brule Reservation, the Pine Ridge Reservation, the Rosebud Indian Reservation, the Standing Rock Reservation, and the Yankton Reservation (subject to federal court decisions removing lands from Indian country status within the Yankton Reservation); (2) any land held in trust by the United States for an Indian tribe (including but not limited to the Sisseton-Wahpeton Oyate Tribe); and (3) any other areas that are "Indian country" within the meaning of 18 U.S.C. Section 1151. The EPA, or eligible Indian tribes, as appropriate, will retain responsibilities under CWA Section 303 for waters in Indian country. Today's action is not intended as an action to approve or disapprove an impaired waters list for waters within Indian country.

In July 2005, EPA issued guidance for integrating the development and submission of 2006 CWA Section 305(b) water quality reports and CWA Section 303(d) lists of impaired waters[1]. This guidance, and subsequent 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 CWA Section 303(d) list. EPA's action in review and approval of this document is only on Category 5 that comprises the CWA Section 303(d) list within the Integrated Report.

EPA reviewed the methodology used by the State in developing the CWA Section 303(d) list and the State's description of the data and information it considered. EPA's review of South Dakota's 2022 CWA 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 2022 list is considered an update of the State's 2020 list (approved 4/13/2020), and as such, the CWA Section 303(d) list EPA is approving today is comprised of 179 assessment units (236 waterbody/pollutant combinations). States may add and take waters off their CWA Section 303(d) lists based on several factors. For the 2022 cycle, South Dakota removed 48 waterbody/pollutant combinations from its

[1] https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf

year 2020 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 CWA 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 CWA Section 303(d) listing requirement applies to waters impaired by point and/or nonpoint sources, pursuant to EPA's long-standing interpretation of CWA Section 303(d).

EPA regulations implementing CWA Section 303(d) require States to identify water quality limited segments (WQLSs) that need total maximum daily loads (TMDL). 40 C.F.R. § 130.7(b). WQLSs[2] 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. Existing and Readily Available Water Quality-Related Data and Information

In developing CWA 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, for 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 CWA 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 Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act[3] describes categories of water quality-related data and information that may be existing and readily available. While States are required to evaluate all existing and readily available water quality-related data and information, States may decide to rely or not rely on particular data or information in determining whether to list particular waters.

In addition to requiring States to assemble and evaluate all existing and readily available water quality-related data and information, EPA regulations at 40 C.F.R. § 130.7(b)(6) require States to include, as part of

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

[3] Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act. Pages 30-32. https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf.

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 CWA 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 CWA 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, consider 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 CWA 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 CWA 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 its 2022 CWA Section 303(d) list considering South Dakota's approved water quality standards, and then reviewed the actual list of waters. The State's Assessment Methodology was provided as part of the Integrated Report. EPA has reviewed the State's submission and determined that the State developed its CWA 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 29, 2005.)[4] By following this guidance, Category 5 of the Integrated Report is the State's CWA Section 303(d) list. EPA's action in review and approval of this document is only with regards to Category 5, which comprises the CWA Section 303(d) list within the Integrated Report.

The State's CWA Section 303(d) list, 2022 Integrated Report, CWA Section 303(d) Listing Methodology, and geospatial coverage of assessment units was submitted electronically through ATTAINS to EPA Region 8. On March 25, 2022 email correspondence from Shannon Minerich, South Dakota Department of Agriculture and Natural Resources to Liz Rogers, EPA Region 8, confirmed the electronic submission.

The year 2022 Integrated Report submitted to EPA from the South Dakota DANR consisted of the following portions that are necessary for the CWA Section 303(d) waterbody list:

- **Waterbodies and corresponding pollutants that make up the State's Section 303(d) list** (See Appendix D, Pages 159-168: 303(d) Summary).
- **Prioritization of waterbodies for TMDL development** (See Appendix D, Pages 159-168: 303(d) Summary).
- **Identification of waters targeted for TMDL development over the next biennium** (See Appendix D, Pages 159-168: 303(d) Summary).

EPA's approval action of South Dakota's year 2022 CWA Section 303(d) list extends only to the items listed immediately above.

The 2022 CWA Section 303(d) waters are found in the State's Integrated Report, Appendix D (CWA Section 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, cause of impairment ("pollutant"), cycle first listed, TMDL Schedule, and TMDL Priority.

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

EPA has reviewed South Dakota's description of the data and information it assembled and evaluated for identifying waters on the CWA Section 303(d) list. EPA concludes that the State properly assembled and evaluated all existing and readily available water quality-related 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 2022 CWA 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 2022 Integrated Report consistent with EPA's guidance regarding combined CWA Section 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 2022 CWA Section 303(d) waterbody list.

[4] https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf

• *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 evaluated data for waters for which dilution calculations or predictive models indicate nonattainment of applicable water quality standards in development of its 2022 CWA 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 2022 Section CWA 303(d) list. Data and information obtained as a result of this effort were assembled and evaluated. 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 2022 CWA 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 the State's 2022 CWA Section 303(d) list meets the requirements of 40 C.F.R. § 130.7(b)(5)(i-iv) regarding the assembly and evaluation of all existing and readily available water quality-related data and information, as well as the requirements of 40 C.F.R. §130.7(b)(1).

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

In addition to adding WQLSs that require TMDLs to its CWA Section 303(d) list, a State may also remove waters from its list when such removal is justified. Reasons for a State to remove a water from the CWA Section 303(d) list[5] include, but are not limited to:

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 2022 CWA Section 303(d) list is provided on Page 22 and in Appendix B, Pages 98-100 of the Integrated Report. The States removal decisions and stated justifications are summarized below:

[5] https://www.epa.gov/sites/production/files/2015-10/documents/2006irg-report.pdf

Number of Waterbody-Pollutant Combinations Removed from List	
Reason	**Waterbody/Pollutant Combinations**
TMDL approved or established by EPA (4a)	9
Applicable WQS attained: based on new data	36
Applicable WQS attained; according to new assessment method	1
Data and/or information lacking to determine WQ status; original basis for listing incorrect	2
Total	**48**

In reviewing the State's 2022 CWA Section 303(d) waterbody list, EPA carefully considered South Dakota's decision to remove certain waterbody-pollutant combinations from the State's 2022 CWA Section 303(d) list, its justification for 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: (1) High Priority (Documented health problems or a threat to human health; Streams listed as impaired because of bacteria, TSS and lakes impaired for mercury in fish flesh; Waters where TMDL development is expected during the next two years; Waters with documented local support for water quality improvement; or Waters in areas of high economic development; and Select lakes impaired for Chlorophyll-a being considered for the 2022 303(d) Vision Priority), and; (2) Low Priority (Waters where local support for TMDL development is expected but not documented; Waters having impairments not listed as High Priority; 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 16 of South Dakota's Integrated Report.

EPA reviewed the State's priority ranking of listed waters for TMDL development and determined the State met the statutory requirements to take 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 determined the State's priority ranking included the identification of waters targeted for TMDL development in the next two years, as required by 40 C.F.R. § 130.7(b)(4).

IV. Final Action on South Dakota's 2022 CWA Section 303(d) List Submittal

After careful review of South Dakota's final CWA Section 303(d) list submittal package, EPA has determined that South Dakota's 2022 CWA Section 303(d) list meets the requirements of Section 303(d) of the CWA and EPA's implementing regulations and approves South Dakota's 2022 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 CWA 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 Fed. Reg. 33040 (July 24, 1992).

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 Fed. Reg. 46012 (Aug. 23, 1999).

April 27, 2000, Federal Register Notice, *EPA Review and Approval of State and Tribal Water Quality Standards*, 65 Fed. Reg. 24641 (April 27, 2000).

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.

August 13, 2015, US EPA Memorandum, Information Concerning 2016 Clean Water Act Sections 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions.

June 7, 2016, 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.

August 25, 2016, South Dakota Department of Environment & Natural Resources response regarding EPA's comments on South Dakota's 2016 draft Integrated Report.

December 22, 2017, USEPA Memorandum, Information Concerning 2018 Clean Water Act Sections 303(d), 305(b) and 314 Integrated Reporting and Listing Decisions.

March 19, 2018, letter from Elizabeth Rogers, Monitoring and Assessment Team, Water Quality Unit, Office of Water Protection, US EPA Region VIII, to Shannon Minerich, Surface Water Quality Program, South Dakota Department of Environment and Natural Resources.

March 30, 2018, letter from Steven M. Pirner, Secretary, South Dakota Department of Environment & Natural Resources, Clean Water Act Section 303(d) Total Maximum Daily Load (TMDL) Waterbody List

March 3, 2020, letter from Elizabeth Rogers, Monitoring and Assessment Team, Water Quality Section, Clean Water Branch, Water Division, US EPA Region VIII, to Shannon Minerich, Surface Water Quality Program, South Dakota Department of Environment and Natural Resources.

March 18, 2020, letter from Hunter Roberts, Secretary, South Dakota Department of Environment and Natural Resources, to Greg Sopkin, Regional Administrator, EPA Region 8, submittal of Final 2020 South Dakota Integrated Report

April 13, 2020, USEPA Action on South Dakota's 2020 Clean Water Act Section 303(d) Waterbody List.

March 1, 2022, letter from Elizabeth Rogers, Monitoring and Assessment Team, Water Quality Section, Clean Water Branch, Water Division, US EPA Region VIII, to Shannon Minerich, Surface Water Quality Program, South Dakota Department of Agriculture and Natural Resources.

March 25, 2022, letter from Hunter Roberts, Secretary, South Dakota Department of Agriculture and Natural Resources, to Kathleen Becker, Regional Administrator, EPA Region 8, submittal of Final 2022 South Dakota Integrated Report

SOUTH DAKOTA WATER QUALITY
WATER YEARS 2016-2021 (streams)
and
WATER YEARS 2011-2021
(lakes and mercury in fish tissue)

The 2022 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 Agriculture and
Natural Resources

Hunter Roberts, Secretary

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Figures

Tables

I. EXECUTIVE SUMMARY

This 305(b) and 303(d) Integrated Report (IR) was prepared by the South Dakota Department of Agriculture and Natural Resources (DANR) in accordance with Sections 305(b), 303(d), and 314 of the Federal Water Pollution Control Act, also known as the Clean Water Act (CWA). This document provides an assessment of South Dakota's surface water resources and identifies impaired waterbodies that require Total Maximum Daily Load (TMDL) development. 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.

South Dakota has about 10,094 miles of perennial rivers and streams (Table 1) and about 87,474 miles of intermittent and ephemeral streams. About 5,888 stream miles have been assessed in the past five years. During this 5-year interval, 21.8% of assessed stream miles were found to support all their assigned beneficial uses; 78.2% did not support one or more beneficial uses. DANR has listed a total of 95 different streams or stream segments as impaired requiring TMDL development. 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 *Escherichia coli* (*E. coli*) contamination from livestock and wildlife contributions. One hundred percent of stream miles assessed for alkalinity, ammonia, arsenic, chloride, chromium, copper, lead, mercury, nickel, nitrate, radium, silver, uranium, sulfate, and zinc met water quality standards.

South Dakota has 584 lakes and reservoirs with specific aquatic life and recreational beneficial use classifications. DANR has assessed 176 of the 584 lakes and reservoirs with assigned recreation and/or fish life beneficial uses for a total of 145,009 lake acres. An estimated 29.6% of the assessed lake acreage was considered to support all assigned beneficial uses. Forty-five lakes do not support water quality standards for the assigned uses but have approved TMDLs. Eighty-four lakes do not support water quality standards for the assigned uses and are on the 303(d) impaired waterbodies list and require TMDL development. The primary cause for nonsupport in lakes is due to mercury in fish tissue.

South Dakota developed a state-specific long-term 303(d) Vision Strategy focused on prioritizing TMDL development. TMDL prioritization for the Vision focused on waters not supporting designated beneficial uses for *E. coli*, TSS, temperature (waters designated coldwater fish life propagation), and mercury in fish tissue. The Vision TMDL prioritization schedule began during the 2016 IR cycle and is scheduled to end September 30, 2022. South Dakota has 58 waterbodies targeted for TMDL development for the 2022 reporting cycle as part of the TMDL Vision priority. South Dakota is on target to complete all Vision priority TMDLs by the September 2022 deadline.

II. INTRODUCTION

This Integrated Report document provides an assessment of South Dakota's surface water resources and identifies impaired waterbodies that require TMDL development. It is the intent of this report to inform the citizens of South Dakota and the 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.

DANR uses the results of the Integrated Report as a tool to stimulate development and prioritization of nonpoint source (NPS) projects and other pollution control activities. This report is shared with the Nonpoint Source Task Force to provide information and guidance. The Nonpoint Source Program also uses this document to supplement news articles released through the DANR Information and Education Project.

States, territories and authorized tribes are required to use EPA's "Assessment and Total Maximum Daily Load Tracking and Implementation System (ATTAINS) to develop integrated report information. ATTAINS is a web-based interface that provides states with a mechanism to record, manage and report all 305(b), 303(d) and 314 information. Reporting tools available in ATTAINS provide EPA with a method to review IR information including status of waters at the national, state, and site-specific level. For example, assessment unit information like waterbody name, size, category, use support, causes of nonsupport, parameters that meet standards, linked TMDLs, and more information is available. DANR used the ATTAINS system to develop the 2022 IR. To learn more about EPA's ATTAINS system visit the following web link:

https://www.epa.gov/waterdata/assessment-and-total-maximum-daily-load-tracking-and-implementation-system-attains

Surface Water Quality

The surface water quality assessments listed in this report rely primarily on the analyses of data generated by DANR, outside organizations, and DANR project sponsors. These groups include the United States Geological Survey (USGS), United States Army Corps of Engineers (USACE), South Dakota Department of Game, Fish, and Parks (GF&P), Nebraska Department of Environmental Quality, the city of Sioux Falls, East Dakota Water Development District (EDWDD), the city of Watertown, city of Sioux Falls, James River Water Development District (JRWDD), Belle Fourche River Watershed Partnership, Day County Conservation District, Moody County Conservation District, Wharf Resources, Friends of the Big Sioux River, Black Hills Resource Conservation & Development, RESPEC Consultants, HydroGeoLogic, and South Dakota State University (SDSU). DANR greatly appreciates data submissions from outside organizations and project sponsors. These submissions provide DANR with increased monitoring data, which improve the confidence of support determinations. Outside organizations may also monitor waterbodies that are not currently monitored by DANR, therefore increasing the extent of waterbodies included in the Integrated Report. While this assessment is as comprehensive as resources allow, some of the state's surface water quality problems may not be identified or documented in this report.

South Dakota has about 10,094 miles of perennial rivers and streams (Table 1) and about 87,474 miles of intermittent and ephemeral streams. About 5,888 stream miles have been assessed in the past five years (October 2016 through September 2021). The stream miles assessed represents the majority of perennial streams and larger tributaries in South Dakota. During this 5-year interval, 21.8% of assessed stream miles were found to support all their assigned beneficial

uses; 78.2% did not support one or more beneficial uses. DANR has listed a total of 95 different streams or stream segments as impaired requiring TMDL development. Similar to previous reporting cycles, nonsupport for fish life uses was caused primarily by total suspended solids from agricultural nonpoint sources and natural origin. Nonsupport for recreational uses was primarily caused by *Escherichia coli* contamination from livestock and wildlife contributions. One hundred percent of stream miles and lake acres assessed for the following parameters met water quality standards: alkalinity, ammonia, arsenic, chloride, chromium, copper, cyanide, lead, mercury (water column), nickel, nitrate, radium, silver, sulfate, uranium, and zinc.

South Dakota has 584 higher-classified lakes and reservoirs designated with an aquatic life use (coldwater permanent, coldwater marginal, warmwater permanent, warmwater semipermanent, or warmwater marginal fish life use) and recreation uses (immersion and limited contact recreation). The four Missouri River mainstem reservoirs are not included in the total lake acres but are included in the monitored river mileage. DANR fully assessed 176 of the 584 lakes and reservoirs assigned recreation and/or warmwater or coldwater fish life beneficial uses totaling 145,009 lake acres. Twelve lakes were only partially assessed or did not have sufficient data to make a support determination. An estimated 29.6% of the assessed lake acreage was considered to support all assigned beneficial uses. Forty-five lakes do not support water quality standards for the assigned uses but have approved TMDLs. Eighty-four lakes do not support water quality standards for the assigned uses and are on the 303(d) impaired waterbodies list and require TMDL development.

Many lakes and reservoirs meet water quality standards associated with their designated uses. Nearly 100% of the lake acres assessed meet water quality standards for specific conductance, nitrates, total dissolved solids, total suspended solids, ammonia, and alkalinity. In addition, greater than 90% of lake acres assessed meet water quality standards for *E. coli*, pH, dissolved oxygen, and water temperature.

Table 1: Atlas

State Population 2020 Census	886,667
State Surface Area (sq. mi.)	77,123
Number of water basins (according to state subdivision)	14
Total number of river/stream miles	97,568*
Number of perennial river miles (subset)	10,094*
Number of intermittent and ephemeral stream miles (subset)	87,474*
Number of border river miles of shared river/streams (subset)	345*
Miles of ditches and canals (man-made waterways)	712
Number of classified lakes/reservoirs/ponds	584
Acres of classified lakes/reservoirs/ponds	243,848
Acres of freshwater wetlands	1,870,790**
Name of border rivers: Missouri River, Big Sioux River, Bois de Sioux River.	

* Estimated from the USGS (2006) National Hydrography Dataset (1:100,000 scale)
** National Wetlands Inventory

South Dakota has an estimated 1.87 million acres of wetland habitats according to the latest National Wetland Inventory study (Dahl, 2014). The total number of wetlands in South Dakota declined 2.8% from 1997 to 2009 (Dahl, 2014). Small temporary wetlands comprised the primary type of emergent wetland loss. South Dakota exhibited gains in all other emergent wetland

classes, especially larger seasonal and semi-permanent classes between 1997 and 2009. The overall wetland area in South Dakota increased from the early to middle 1990s to 2009 (Johnson and Higgins, 1997 and Dahl, 2014).

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):
DANR 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 sources. Nonpoint pollution controls must reflect this by wisely using resources available from various state, federal, and local organizations, plus landowner support and participation. South Dakota primarily uses voluntary measures for the implementation of Best Management Practices (BMPs) to control NPS pollution. The CWA Section 319 program is the focal point for a majority of the existing NPS control programs. Since about 1990, the 319 program has been developing and implementing watershed restoration projects throughout the state.

Public information and education efforts have increased awareness of NPS pollution issues. State and federal programs provide technical assistance and financial incentives to landowners to address NPS pollution problems. 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.

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

North Dakota, Minnesota, Iowa, Nebraska, Wyoming, and Montana possess interstate or border waterbodies that are shared with South Dakota. Under the authority of the CWA, 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, with limited exceptions, 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 an interstate or border waterbody, interested parties should contact each state.

Comparison of Beneficial Use Support between Integrated Reporting Cycles

South Dakota's Integrated Report describes the percentage of stream miles that support beneficial uses. This general statistic is intended to characterize use support for a given reporting cycle and does not provide for a balanced comparison or trend analysis between reporting cycles. The number of stream miles assessed changes between reporting cycles, assessment

methodologies evolve, water quality standards may change, and datasets can change considerably. In addition, new assessment units are continually being added and removed between reporting cycles. Due to these factors, it is not possible to determine trends between reporting cycles as the appearance of a trend may have nothing to do with changes in water quality.

Interactive Applications Available to the Public

The South Dakota Surface Water Quality Standards Mapping Application is an online mapping application. It serves as an informational reference and links to the water quality standards that apply to each waterbody. The application also includes waterbody support status based on the most recently approved Integrated Report. The South Dakota Surface Water Quality Standards Mapping Application is available online at:
https://sdgis.sd.gov/portal/apps/MapSeries/index.html?appid=f3e56d2e55a34c65b7d78b07ef1e677e

The Water Quality Monitoring Access Portal (WQMAP) is an online mapping application that provides access to water quality data collected by DANR and local partners. Data from approximately 150,000 water samples and 8,500 fish flesh contaminant samples collected at approximately 3,600 monitoring stations has been made accessible to the public through WQMAP. This application also provides information about the beneficial use support status of waters, links to water quality documents and information about water quality restoration projects. The collective water quality data is used for a variety of applications, including beneficial use support assessments for the Integrated Report and TMDL development. WQMAP is located online at:
https://apps.sd.gov/NR92WQMAP.

III. SURFACE WATER QUALITY ASSESSMENT

SURFACE WATER QUALITY MONITORING

General Discussion

South Dakota DANR monitors surface waters in the state through an established statewide ambient stream water quality monitoring program and statewide lakes assessment program. Additional monitoring outlets include: regional water quality assessments, stream biological assessment surveys, TMDL watershed assessments, Surface Water Discharge permits, and state nonpoint source implementation projects. The USGS also conducts routine monitoring throughout the state and that data is available on their website. DANR maintains an internal water quality database (NR92) and submits water quality data through EPA's Water Quality Exchange to EPA's Water Quality Portal.

Surface water quality standards were initially established in 1967 by the state's Committee on Water Pollution. For the most recent triennial review of water quality standards, the Water Management Board held a public hearing on December 2, 2020, and completed the State rule revision. The Interim Legislative Rules Review Committee approved these revisions on April 6, 2021. The rules were filed with the Secretary of State on April 7, 2021 and became state law. The revised standards were submitted to EPA on April 27, 2021 and were approved on June 25, 2021. Water quality standards consist of water quality criteria necessary to protect assigned beneficial uses and an antidegradation policy that protects existing uses and high-quality waters.

DANR 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.

At a minimum, 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. At a minimum, all lakes and wetlands are assigned the beneficial use of (9). Lakes listed in ARSD Chapter 74:51:02 are assigned the beneficial uses of (7), (8), and (9) unless otherwise specified.

ARSD Chapter 74:51:01 Surface Water Quality Standards is available at: http://www.sdlegislature.gov/Rules/DisplayRule.aspx?Rule=74:51:01 and a subset of the standards for the beneficial uses are shown in Table 2.

State toxic pollutant standards for human health and aquatic life are available at: http://www.sdlegislature.gov/Rules/DisplayRule.aspx?Rule=74:51:01:55 and http://www.sdlegislature.gov/Rules/DisplayRule.aspx?Rule=74:51:01:0B.

Site specific standards are available in ARSD Chapters 74:51:01:45.01, 74:51:01:46.01, 74:51:01:48.01, 74:51:01:48.02, 74:51:01:53.01, 74:51:01:56, and are available at: https://sdlegislature.gov/Rules/DisplayRule.aspx?Rule=74:51:01.

Fixed Station Ambient Monitoring

The DANR water quality monitoring network is currently made up of 153 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 data collected is invaluable for evaluating historical water quality, establishing natural background conditions, monitoring possible runoff events, and acute or chronic water quality concerns.

The most commonly sampled parameters include *E. coli*, TSS, total dissolved solids, pH, ammonia, nitrates, dissolved oxygen, water temperature, pH, specific conductance, and total phosphorous. 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.

Ambient station locations, descriptions, and schedules are available online at: https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/waterqualitystandards/swqmonitoring.aspx or from DANR upon request.

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[2]										
Chloride	≤250[1]/≤438[2]	≤100[1]/≤175[2]									
Coliform, total (per 100 mL)	≤5,000 (geomean): ≤20,000										
Escherichia coli[4] (per 100mL)							≤126[6]/ ≤235[2]	≤630[6]/ ≤1,178[2]			
Microcystin[4, 8, 9]							≤8	≤8			
Cylindro-spermopsin[4, 8, 9]							≤15	≤15			
Conductivity (umhos/cm @ 25ºC)									≤4,000[1]/ ≤7,000[2]	≤2,500[1]/ ≤4,375[2]	
Fluoride	≤4.0[2]										
Hydrogen sulfide undisassociated		≤0.002[2]	≤0.002[2]	≤0.002[2]	≤0.002[2]	≤0.002[2]					
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[2]								≤50[1]/≤88[2]		
Oxygen, dissolved[2, 3]		≥6.0[2]; ≥7.0[2] (during spawning season)	≥5.0[2]	≥5.0[2]; ≥6.0[2] (in Big Stone & Traverse during Apr and May)	≥5.0[2]	≥4.0[2] Oct1-Apr30; ≥5.0[2] May1-Sep30	≥5.0[2]	≥5.0[2]			
pH (standard units)	≥6.5-9.0	≥6.5 - ≤9.0[10]	≥6.5 - ≤9.0[10]	≥6.5 - ≤9.0[10]	≥6.5 - ≤9.0[10]	≥6.0 - ≤9.0[10]			≥6.0 - ≤9.5[10]		≥6.0 - ≤9.5[10]
Sodium Adsorption Ratio[7, 11]										≤10	
Solids, suspended[7]		≤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)[7]		≤65	≤75	≤80	≤90	≤90					
Total Petroleum Hydrocarbons	≤1.0[2]								≤10[13]		
Oil and Grease									≤10[13]		

[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] Refer to Appendix A of Chapter 74:51:01; [6] Geometric mean as defined in ARSD 74:51:01:01(24) and 74:51:01:50-51; [7] Site specific standards exist; [8]Not to be exceeded in more than three 10-day assessment periods over the course of the recreation season; [9] Unit of measure ug/L; [10] See 74:51:01:07; [11] See 74:51:01:01(41); [12] See 74:51:01:31; [13] See 74:51:01:10.

For a complete list of WQS refer to ARSD 74:51.

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, DANR 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 been conducted on Moccasin Creek, Boxelder Creek, Whitewood Creek, Spring Creek, South Fork Whetstone, and the Redwater River.

Intensive water quality monitoring may also be initiated to investigate quality control issues, collect data for use in compliance, enforcement, site-specific criteria development, or to provide updated information for a waterbody.

Use Attainability Analysis

DANR conducts a Use Attainability Analysis (UAA) on waterbodies assigned only 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. Additionally, DANR may also conduct a UAA to determine if a waterbody is currently assigned the appropriate beneficial uses or if changes should be made. 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 beneficial use designation.

Recreation Use Study

During the summer months of 2008 through 2021, DANR assessed and will continue to assess the recreation beneficial use of waters that are assigned the (8) Limited contact recreation waters beneficial use. 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. Surface water quality samples are collected and analyzed for *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.

General Biological Monitoring and Assessment

Biological samples are often included as part of a use attainability assessment, watershed assessment study, or special project. In limited cases, biological samples may be required under certain permits. DANR's Watershed Protection Program incorporates aquatic plant/algae surveys into lake studies. Stream studies incorporate bioassessment surveys using fish, aquatic macroinvertebrates, periphyton and mussels as biological indicators of water quality.

Perennial-Wadeable Stream Bioassessment

DANR and research partners from SDSU identified stream reference sites and developed bioassessment tools for perennial wadeable streams in the Northern Glaciated Plains (NGP) ecoregion of eastern South Dakota (Appendix E). The project focused on reference site validation,

Index of Biological Integrity (IBI) development, and generation of a biomonitoring toolkit to increase the state's 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 Master of Science theses, and several peer-reviewed journal publications. Results of this effort will be used for a variety of water resource management applications including evaluating nutrient-related narrative standards. Future work is being focused on expanding the reference site network and gaining existing reference site data.

DANR and research partners from SDSU expanded reference site development and bioassessment efforts to the Northwestern Great Plains ecoregion (43) in western South Dakota (Appendix E). The project began in 2013 and commenced in the fall of 2017. The project was based on a random probabilistic survey design stratified by level 4 ecoregions. Final project deliverables were similar to those produced in the aforementioned NGP ecoregion. Results of this effort are expected to be used for a variety of water resource management applications including evaluating nutrient-related narrative standards for the 2022 reporting cycle. Future work will be focused on expanding the reference site network and gaining existing reference site data.

Intermittent Stream Bioassessment

A large majority of the stream miles (90%) in South Dakota are characterized as intermittent or ephemeral (USGS, NHD 2006). 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.

DANR was awarded an EPA R-EMAP research grant (2006-2010) to develop a reference site network for intermittent streams in the NGP ecoregion of eastern South Dakota (Appendix E). The intermittent stream reference site project was conducted through a collaborative effort between DANR and the Natural Resource Management Department at SDSU. 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 water quality decisions with regards to habitat and biotic integrity of potentially impacted streams. Aquatic macroinvertebrates are 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 of intermittent streams. Final deliverables associated with the intermittent stream reference site project included a detailed project summary, two Master of Science theses, and two peer-reviewed publications.

Biological Reference Collection and Database

DANR and GF&P provided financial and technical support for the development of a statewide biological reference collection and database. Support and maintenance of the collection and database is currently being negotiated with research personnel from the Natural Resource Management Department at SDSU. Aquatic macroinvertebrates, fish, and mussel voucher specimens from statewide collection efforts were processed and stored on campus. All information associated with each individual specimen including geo- location was documented in the SPECIFY database cloud developed and maintained by Kansas State University. The long-term goal of the project is to make biological information available to a variety of users.

Fish Contaminants Sampling

In a collaborative effort among GF&P, the Department of Health, and the DANR, fish tissue from lakes and rivers are sampled and analyzed for contaminants including mercury, cadmium, selenium, pesticides, and PCBs. The data are used to monitor and assess the levels of these contaminants present in fish flesh.

The sampling locations and schedule are determined in a joint effort by GF&P and DANR personnel. The rivers and lakes are typically sampled in conjunction with GF&P's survey sampling and occur between early spring and late fall. Waterbodies are selected based on GF&P fishery management objectives, public access, and fishing pressure. Waterbodies are resampled based on contaminant concentrations in fish tissue.

The data is used by both the Department of Health and DANR. The Department of Health will issue a fish consumption advisory when sampling results indicate the one part per million Food and Drug Administration mercury threshold may be exceeded in edible fish tissue. DANR also uses mercury in fish tissue results to assess the mercury in fish tissue water quality criterion (0.3 mg/kg) and determine waterbody support. Fish tissue sampling design and procedures are addressed in the Surface Water Quality Program document *South Dakota Fish Contaminants Sampling Protocol*, January 2013.

Statewide Lake Assessment Program

DANR implemented a targeted approach to monitor and assess lakes and reservoirs within the state. The targeted approach focuses exclusively on waterbodies with Assessment Unit Identifications (AUIDs) in the most recent Integrated Report cycle. The current annual goal of the program is to sample 35 lakes per year at a minimum of three times during growing season defined as May 1st to September 30th. Annual lake selection is based on priority criteria and a tiered approach to allow flexibility.

Priorities and decision tiers of the Statewide Lakes Assessment Program

- Integrated Report Assessment: Lakes with a nonsupport status that require updated data to determine status (EPA categories 4a and 5). Lakes that lack water quality data to make an assessment determination (EPA categories 2 and 3).
- TMDL Development: High Priority lakes and those on the 303(d) Vision Priority Schedule.
- Public Importance: Lakes are divided into three tiers based on best professional judgment of economic value, recreation use, and public interest.
    - Tier 1 – Lakes with the highest economic value, recreation use, and public interest. Lakes in this tier will be sampled on average 3 times over the course of a 10-year period.
    - Tier 2 – Lakes with significant economic value, recreation use, and public interest. Lake in this tier will be sampled twice over the course of a 10- year period.
    - Tier 3 – Lakes with the least amount of economic value, recreation use, and public interest. Lakes in this tier will only be assessed when prioritized for TMDL development or Integrated Report Assessment.

Rotating Basin-Region Assessment

The rotating basin/regional assessment project relies on partnerships with outside water resource agencies within the state. The goal of the assessment is to monitor lakes and streams in major river basins or large geographic regions for two years during the growing season and then rotate to a new region. The rotating basin assessment will focus on all lake and stream AUIDs in each basin or region with the goal of assessing all AUIDs over a ten-year period.

EDWDD field personnel assessed 42 stream segments twice per month (May to October) and 34 lakes monthly (May to September) in the Big Sioux, Red, and Minnesota River basins during the 2020 and 2021 field season. The monitoring project allowed for collection of data on almost all waterbodies within the Big Sioux, Red, and Minnesota River basins. The following rotation for this regional assessment will be in the Belle Fourche and Upper Cheyenne River basins.

State-Scale Statistical Survey

South Dakota's state-scale statistical survey results were derived from EPA's National Aquatic Resource Surveys. South Dakota participates in both the National Lakes Assessment (NLA) and National Rivers and Streams Assessment (NRSA) conducted on a 5-year rotation. These surveys characterize the water quality of lakes, rivers, and streams by using a representative sample of comparatively few members or sites. Using the sites randomly selected from SD, state scale estimates for biological, chemical, physical habitat and human health indicators were calculated with 95% confidence. As more surveys are conducted in the future, SD will be able to report on trends for these indicator groups. For the 2022 IR, only estimates from the 2012 and 2017 NLA and the 2013-2014 NRSA were available for reporting. Indicator estimates from the 2018-2019 NRSA should be available for the 2024 IR cycle. The next NLA and NRSA surveys are scheduled to begin during the summers of 2022 and 2023, respectively.

Toxicity Testing Program

Whole Effluent Toxicity (WET) testing measures the effect of wastewater on specific aquatic organisms' ability to survive, grow, and reproduce. WET limits and monitoring are included in surface water discharge permits if a reasonable potential analysis determines they need to be included in the permit. The permits are developed following the EPA-approved DANR WET Implementation Plan. This plan helps determine if the permittee will need acute or chronic testing and what limits need to be included. Additionally, it identifies the frequency of testing and other requirements that may need to be included. WET tests are expensive and there are only select labs that are able to perform these tests. Currently, there are twenty-three Major facilities and thirty Minor facilities with WET monitoring or limit requirements. A few facilities perform both acute and chronic testing.

Priority toxic monitoring is included in all major municipal permits. The frequency of analysis depends on the size of the wastewater treatment facility and whether or not the municipality has an approved pretreatment program. The frequency of analysis varies from once every five years for smaller facilities without a pretreatment program to annually for larger wastewater treatment facilities with a pretreatment program. A list of priority toxics is available at:
https://www.ecfr.gov/cgi-bin/text-idx?SID=84083f4206da829ac7b485da614bdae3&mc=true&node=ap40.24.122_164.d&rgn=div9

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 to ensure support of 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 CWA requires states to develop and submit a biennial list of impaired waters targeted for TMDL development, referred to as the 303(d) list. Pollutant causes, TMDL priority, and a schedule for TMDL development is required. TMDLs must allow for seasonal variations and provide a margin of safety to account for uncertainty. 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 CWA:

- 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 DANR's 2022 303(d) list.

Impaired Waters

Waterbodies that are identified as "NON" (nonsupporting) under the "Support" column in the basin tables are placed in EPA Category 5 which identifies the waterbody as impaired and requires a TMDL. This is the basis for the 303(d) list. If a waterbody is identified as "NON" but has an approved TMDL for the pollutant cause the waterbody is placed in EPA Category 4a (nonsupporting with a TMDL).

Waters with Surface Water Discharge-Related Wasteload Allocations

In 1993, DANR was delegated the authority to administer the 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. Where the application of technology-based effluent limits is not sufficient to ensure the surface water quality standards are maintained, DANR 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, 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

DANR did not receive any recommendations to list specific water resources on the 2022 303(d) list from outside government agencies, members of the general public, environmental organizations, or academic institutions.

TMDL Prioritization of 303(d) Listed Waters

EPA regulations codify and interpret the requirement in Section 303(d)(1)(A) of the CWA such that states establish a priority ranking for waters listed as impaired in their Integrated Reports. The regulations of 40 Code of Federal Regulations Part 130.7(b)(4) require states to prioritize waters in their Section 303(d) lists for TMDL development and to identify those water quality limited segments targeted for TMDL development in the next two years. States may consider other factors relevant to prioritizing waters for TMDL development including programmatic needs such as identification of wasteload allocations for permits; vulnerability of certain waters to degradation; waters in areas of high economic development; ecological, recreational, economic, and aesthetic values; degree of public interest and support; and state or national policies and priorities. DANR has a two-tiered priority scheme.

High Priority

- Documented health problems or a threat to human health;
- Streams listed as impaired because of bacteria, TSS and lakes impaired for mercury in fish flesh;
- Waters where TMDL development is expected during the next two years;
- Waters with documented local support for water quality improvement; or
- Waters in areas of high economic development; and
- Select lakes impaired for Chlorophyll-a being considered for the 2022 303(d) Vision Priority.

Low Priority

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

SOUTH DAKOTA'S LONG-TERM VISION STRATEGY

Section 303(d) of the CWA provides for an opportunity to more effectively restore and protect South Dakota's waters by using a systematic process of prioritizing TMDL development and implementing alternative approaches and protection activities. A Long-Term Vision Strategy (hereafter referred to as the Vision) was developed by the EPA and six actions were identified as being important to this process. South Dakota developed a state-specific Vision strategy to address the six action items.

Engagement

The Vision for the CWA 303(d) Program asks EPA and the states to actively engage the public and other stakeholders to improve and protect water quality, as demonstrated by documented, inclusive, transparent, and consistent communication; requesting and sharing feedback on proposed approaches; and enhanced understanding of program objectives.

South Dakota uses multiple means to engage the public and stakeholders and these will be used as part of the Vision. The NPS Task Force will be a primary means of getting information about the Vision to the stakeholders. The NPS Task Force is a citizen's advisory group containing approximately twenty-five agencies, organizations, and tribal representatives. The NPS Task Force meetings are open to the general public. The NPS Task Force provides a forum for the exchange of information and activities about NPS-related activities, as well as providing recommendations for projects applying for CWA Section 319 funds. DANR gave a presentation about the Vision to the NPS Task Force on December 9, 2014. The EPA also participated in the meeting and responded to questions during the presentation. There was much discussion of the Vision, the TMDL Prioritization Scheme, and how the Vision would impact NPS Implementation Projects. A presentation was also given during the NPS Coordinators meeting on April 22, 2015. Additional presentations about the Vision will occur as needed.

A September 2015 EPA/State joint Nonpoint Source Pollution and Water Quality Meeting was held in Rapid City, South Dakota and brought together the states in EPA Region 8, as well as other regional interests. The Vision plans for each state were presented and each state responded to questions/comments about their Vision plan.

The public notice process used to announce the availability of the Integrated Report (IR) is the primary forum used to engage the public regarding the Vision Strategy. The public notice process allows the public and stakeholders the opportunity to formally comment on contents of the IR and the Vision Strategy. Additional efforts to inform the public and stakeholders about the Vision will occur in response to requests by stakeholders and the public.

Some elements of the Vision, such as Alternative or Protection activities, may be incorporated into NPS Implementation projects. If these projects request CWA Section 319 funds, these projects will be presented to the NPS Task Force as well as the South Dakota Board of Water and Natural Resources for review and approval of funding. This provides additional opportunities for public comment. The Vision Strategy will also be included in the South Dakota NPS Management Plan.

Prioritization

The Vision prioritization process focused on waters considered *High Priority* for TMDL development following the criteria described in the 2022 IR. The original Vision priority waters were those not supporting designated beneficial uses for bacteria, TSS, temperature (waters designated coldwater fish life propagation), and mercury in fish tissue. The current Vision priority waters and status are documented in Table 3.

EPA declared an open season for states to make changes to the Vision priority waters list. States' revised Vision priority lists were due to EPA in August of 2018. South Dakota removed 25 waters from the original Vision priority list during the open season. The main changes included removal of waters delisted during the 2018 reporting cycle. In addition, seven waters were removed due to TMDL development data needs and unspecified reasons. The revised Vision priority list included 44 waterbodies with varying TMDL completion status.

EPA also granted limited opportunity for states to make final adjustments to Vision priorities following the 2020 reporting cycle. The main purpose of this limited adjustment opportunity was to compensate for delisting that occurred during the 2020 reporting cycle. EPA encouraged states to replace waters removed from the priority with impaired waters of similar size (acres/miles) to maintain a similar universe size from that finalized during the 2018 open season adjustment. South Dakota removed 4 waterbodies from the 2018 priority list and replaced them with 18 waterbodies. The final Vision priority list includes 58 waterbodies with varying TMDL completion status (Table 3). Changes to the final TMDL priority list are open for public comment as part of the IR public participation process (Section V. page 7). South Dakota is on pace to complete the Vision priority TMDLs by September 30, 2022.

Protection

This element is intended to encourage management actions that prevent impairments to waters not currently impaired. South Dakota is receptive to this concept and will consider providing technical or financial assistance to these types of projects. There is no anticipation of a large number of requests for "protection" activities and DANR will consider each as they become known. Requests for funding for CWA Section 319 funds will follow the same protocols as other projects requesting these funds and the "protection" activities must be identified as such. Protection activities within an existing implementation project must also identify those activities as "protection" activities.

Integration

DANR has very good working relationships with other programs, and regional, state and federal agencies. The NPS Task Force is a major forum for interaction between the various federal, state, regional, and local agencies, as well as the general public. The Natural Resources Conservation Service (NRCS) is the primary federal agency that DANR interacts with on NPS implementation projects. CWA Section 319 funds are often used in concert with NRCS funds to more efficiently use both funding sources to combat NPS pollution. The U.S. Forest Service, U.S. Bureau of Reclamation, or Bureau of Land Management may also be involved in DANR's NPS control effort when activities will occur on or impact lands managed by these agencies. USGS provides essential water flow and water quality data in certain rivers and streams in South Dakota and has been a partner in various water quality assessment activities.

Regional or local agencies are often project sponsors for NPS assessment or implementation projects. Water development districts, conservation districts, cities, and locally based partnerships have all interacted with DANR and have integrated into NPS assessment and implementation

projects. Universities have been involved in South Dakota's NPS control effort through research studies that help the state assess water or biological quality of our streams.

Alternatives

In addition to TMDLs, alternative approaches that incorporate adaptive management or are tailored to specific circumstances may be used. Alternative approaches may be better suited to implement priority watershed or water actions to restoration under certain circumstances. DANR requires a TMDL to be developed before funds are allocated towards a NPS 319 Implementation Project. Consideration will be given to projects or cases where a relatively simple or straight-forward solution can be reached without going through the full TMDL development process. Requests for funding for CWA Section 319 funds will follow the same protocols as other projects requesting these funds and the "alternative" activities must be identified as such. DANR also supports an Information and Education Project that may be useful in circumstances where public outreach and education can help to identify alternative approaches to resolving water quality issues.

Assessment

The goal of this element is to identify the extent of healthy and impaired waters in each State's priority watersheds or waters through site-specific assessments. South Dakota uses different methods and data sources to assess waters including:

- Fixed ambient monitoring of rivers and streams. The major rivers and streams in the state are sampled monthly;
- Data obtained from regional sources or federal agencies (e.g. the USGS or volunteer monitoring programs);
- A subset of lakes sampled multiple times annually as part of the Statewide Lakes Assessment (SWLA) project;
- Intensive lake and stream monitoring conducted on a two-year rotating basis within major river basins through partnerships with water resource entities;
- Random statistical surveys in conjunction with EPA's National Lakes Assessment and National Rivers and Streams Assessment;
- Site-specific assessments if more general data methods/surveys do not provide adequate data.

South Dakota's assessment strategies provide water quality data for 303(d) assessment and TMDL development. Several monitoring and assessment strategies are designed to provide flexibility to meet data needs of individual waters as 303(d) priorities change. Intensive monitoring and assessment strategies will help to guide future Vision priorities including protection and alternative approaches.

DANR worked with EPA Region 8 to develop chlorophyll-a targets for lake 303(d) nutrient-related assessments. Chlorophyll-a targets serve as TMDL endpoints to evaluate nutrient-related narrative standards and associated use attainment. Chlorophyll-a targets were finalized for three main lake classes; Black Hills Lakes, Western Lakes and Eastern Lakes. South Dakota will likely focus on lake impairment and TMDL development in the next Vision cycle.

South Dakota has a well-documented history of doing site-specific assessments and will continue to develop and schedule assessment projects where data are deemed lacking for waters needing a TMDL. Site-specific assessments are either done by DANR personnel if the waterbody is within reasonable travel distance or by a regional entity/contractor if funds are available and direct DANR

involvement is not the best option. Computer modelling, scientific literature, and reference conditions may also be used to assess waters.

Vision Summary

The South Dakota strategy for the Long-Term Vision under the CWA Section 303(d) Program contains the six elements stressed by EPA. The primary goal is to prioritize TMDL development for the Vision where implementation activities can be focused to provide a better chance of improving water quality. South Dakota may also prioritize TMDLs that are considered of state importance and require immediate action. South Dakota's current Long-Term Vision priority waters and status are documented in Table 3. The Vision is open to public comment as part of the IR public participation process (Section V. page 7).

Table 3: South Dakota's Final (2022) Vision Priority Waters and Status

ASSESSMENT UNIT ID (AUID)	CAUSE NAME	STATUS
SD-BF-L-NEWELL_01	Mercury in fish	TMDL Completed and approved
SD-BF-R-BELLE_FOURCHE_01	*E. coli*	TMDL Completed and approved
SD-BF-R-DEADWOOD_01	*E. coli*	TMDL Completed and approved
SD-BF-R-WHITEWOOD_04	*E. coli*	Draft-development
SD-BS-L-BITTER_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-ISLAND_N_01	Mercury in fish	TMDL Completed and approved
SD-JA-L-LARDY_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-LONG_COD_01	Mercury in fish	TMDL Completed and approved
SD-JA-L-MID_LYNN_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-MINNEWASTA_01	Mercury in fish	TMDL Completed and approved
SD-JA-OPITZ_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-REID_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-SWAN_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-TWIN_01	Mercury in fish	TMDL Completed and approved
SD-BS-L-TWIN_02	Mercury in fish	TMDL Completed and approved
SD-BS-R-BEAVER_02	*E. coli*	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_01	*E. coli*	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_05	TSS	Draft-development
SD-BS-R-BIG_SIOUX_06	TSS	Draft-development
SD-BS-R-BRULE_01	TSS	Draft-development
SD-BS-R-BRULE_01	*E. coli*	TMDL Completed and approved
SD-BS-R-SIXMILE_01	*E. coli*	Draft-development
SD-BS-R-SKUNK_01	*E. coli*	Draft-development
SD-CH-R-RAPID_04	*E. coli*	TMDL Completed and approved
SD-CH-R-SPRING_01	*E. coli*	Draft-development

Table 3: South Dakota's Revised (2022) Vision Priority Waters Status (continued)

ASSESSMENT UNIT ID (AUID)	CAUSE NAME	STATUS
SD-JA-L-ELM_01	Mercury in fish	TMDL Completed and approved
SD-JA-R-JAMES_11	TSS	Draft-development
SD-JA-R-WOLF_01	*E. coli*	TMDL Completed and approved
SD-JA-R-WOLF_02	*E. coli*	TMDL Completed and approved
SD-MI-L-HURLEY_01	Mercury in fish	TMDL Completed and approved
SD-MI-L-ROOSEVELT_01	Mercury in fish	TMDL Completed and approved
SD-MN-R-WHETSTONE-S-FORK-01	*E. coli*	Draft-development
SD-MN-R-WHETSTONE-S-FORK-02	*E. coli*	Draft-development
SD-MN-R-YELLOW_BANK_N_FORK_01	*E. coli*	TMDL Completed and approved
SD-MN-R-YELLOW_BANK_S_FORK_01	*E. coli*	TMDL Completed and approved
SD-MU-L-COAL_SPRINGS_01	Mercury in fish	TMDL Completed and approved
SD-VM-R-LONG_01	*E. coli*	TMDL Completed and approved
SD-VM-R-VERMILLION_03	*E. coli*	Draft-development
SD-VM-R-VERMILLION_E_FORK_01	*E. coli*	TMDL Completed and approved
SD-VM-R-VERMILLION_W_FORK_01_USGS	*E. coli*	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_08	E. coli	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_08	TSS	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_10	E. coli	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_10	TSS	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_11	E. coli	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_11	TSS	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_12	E. coli	TMDL Completed and approved
SD-BS-R-BIG_SIOUX_12	TSS	TMDL Completed and approved
SD-BS-L-GRASS_01	Mercury in fish	Draft-development
SD-BS-L-SCOTT_01	Mercury in fish	Draft-development
SD-CH-L-DURKEE_01	Mercury in fish	Draft-development
SD-CH-L-NEW_WALL_01	Mercury in fish	Draft-development
SD-GR-L-EAST_LEMMON_01	Mercury in fish	Draft-development
SD-JA-L-CLEAR_M_01	Mercury in fish	Draft-development
SD-JA-L-ROY_01	Mercury in fish	Draft-development
SD-JA-L-STINK_01	Mercury in fish	Draft-development
SD-MI-L-POTTS_01	Mercury in fish	Draft-development
SD-NI-L-DOG_EAR_01	Mercury in fish	Draft-development

Summary of the State TMDL Waterbodies

Using the methodologies, data, information, and public input described for the surface water quality assessments, DANR included the waterbodies that require TMDLs in Appendix D. These tables include waterbody names, pollutants of concern, and other information. A total of 179 different waterbodies require TMDLs. Each waterbody may contain several different pollutants and thereby may constitute several TMDLs. This results in 236 required TMDLs due to multiple impairment causes. The 303(d) List of waterbodies that require TMDL development is available in Appendix D.

Resource Implications
The development and implementation of TMDLs relies on existing programs, resources, and activities. TMDL development requires effective and continuous coordination from several DANR water programs. In addition, TMDLs must have the support, input, and coordination from affected government agencies, local groups, and citizens. TMDL development involves coordination from many diverse groups sharing the common goal of improving water quality.

Delisting Reasons

Delisting of Waterbodies
Waters may be delisted using the following EPA delisting reasons:

- Applicable water quality standard attained, according to new assessment method;
- Applicable water quality standard attained, due to change in water quality standard;
- Applicable water quality standard attained, due to restoration activities;
- Applicable water quality standard attained, based on new data;
- Applicable water quality standard attained, original basis for listing was incorrect;
- Applicable water quality standard attained, reason for recovery unspecified;
- Clarification of listing cause;
- Data and/or information lacking to determine water quality status, original basis for listing was incorrect;
- Listed water not in state's jurisdiction;
- Water determined to not be a water of the state;
- Water quality standard no longer applicable; or
- TMDL Approved or established by EPA (4a).

Appendix B provides a list of waterbodies, causes, and delisting reasons used for the 2022 reporting cycle.

LISTING 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 DANR, outside organizations, and DANR project sponsors.

DANR 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 DANR Quality Management System, Quality Assurance Project Plans, and Standard Operating Procedures. It also includes the preparation of periodic reports to DANR 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. The establishment of schedules for the collection of duplicate and blank samples, laboratory split samples, review of field sampling techniques, and coordination with contracted labs to ensure compliance with QA/QC objectives are required.

DANR maintains an EPA-approved *Quality Management Plan* (Revision V, September 2016). The Surface Water Quality Program operates under the *Quality Assurance Project Plan for the Surface Water Quality Program and Feedlot Permit Program,* Revision IV, January 2020, and *Surface Water Quality Program and Feedlot Permit Program Standard Operating Procedures, Field Water Quality Sampling,* Revision III, January 2016. These documents are available at: https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/waterqualitystandards/swqmonitoring.aspx. The Watershed Protection Program operates under the *Watershed Protection Program Quality Assurance Project Plan for the Assessment Team and Implementation Team,* Revision V, March 2016. This document is available at: https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications/wpqapp2016.pdf. *The Standard Operating Procedures for Field Samplers, Volume I* (Revision 6.2, May 2018) *& Volume II* (Revision 3.2, May 2018) can be accessed at *https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications.aspx.*

DANR requires that all outside organizations that submit data or qualitative evaluations for this Integrated Report operate under a quality management system and be willing to provide quality assurance documentation upon request.

Rivers and streams were assessed by dividing 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. The Hydrography Event Management Tool developed by USGS was used to create lakes and stream segments as part of the geospatial package. Lake acreage and stream miles were determined using medium resolution geospatial data from the National Hydrography Dataset. Monitoring data obtained during the current reporting period were analyzed using DANR's NR92 database-generated reports.

The data for each monitored waterbody were compared to numeric water quality standards applicable to the beneficial uses assigned to the segment and nutrient-related narrative standards.

Table 4: Criteria for Determining Support Status

Description	Minimum Sample Size	Impairment Determination Approach
FOR CONVENTIONAL PARAMETERS (such as dissolved oxygen, TSS, *E. coli* bacteria, pH, water temperature, etc.)	STREAMS: a minimum of 20 samples (collected on separate days) for any one parameter are required within a waterbody reach. A minimum of 10 chronic (calculated) results are required for chronic criteria (30-day averages and geomeans). LAKES: Reference the lake listing methodology starting on page 31.	STREAMS: >10% exceedance for daily maximum criteria or >10% exceedance for 30-day average criteria OR when overwhelming evidence suggests nonsupport/support LAKES: Reference the lake listing methodology starting on page 31.
FOR TOXIC PARAMETERS (such as metals, total ammonia, etc.)	All Lakes and Streams: Minimum of 2 samples within a consecutive 3-year period within the data age date range.	All Lakes and Streams: More than one exceedance of toxic criteria within a consecutive 3-year period (within the data age date range) for the acute and/or chronic standard.
FOR MERCURY IN FISH TISSUE	All Lakes and Streams: A minimum of 10 fish tissue samples are required. A minimum of 3 fish tissue samples per species. No minimum number of sample events. All available data from October 2011 through September 2021 was used.	All Lakes and Streams: The composite mean result of each fish species will be compared to the WQS. If any species mean composite result exceed the WQS it will be considered nonsupporting. OR if a fish consumption advisory has been issued.
DATA AGE (for both conventional and toxic parameters)	STREAMS: Data collected from October 1, 2016, through September 30, 2021 (unless otherwise noted) LAKES: All available data collected from October 2011 through October 2021 Although the reporting cycle spans two years, that data age does not allow for sufficient temporal variability. Therefore, the above data ages will be used unless there is justification that the data are not representative of current conditions.	

Assessment Methodology for Numeric Water Quality Standards

Table 4 outlines data age and the required number of samples used by DANR to determine waterbody support. Deviations from the above criteria were allowed in specific cases and are generally discussed in the river basin summaries. Use support assessment for all assigned uses was based on the number of exceedances of water quality standards for the following parameters: TSS, total dissolved solids, pH, water temperature, dissolved oxygen, *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. If multiple samples are collected on the same day within an AUID, the worst sample is compared to the daily maximum criteria. Toxic parameters are only allowed one violation in a three-year period to be considered fully supporting. The weekly average temperature is calculated on a rolling seven-day period. Chronic standards, including geometric means and 30-day averages, are applied to a calendar month. Weekly data is composited and then averaged across a minimum of 3 separate weeks in a calendar month to calculate the 30-day average or geomean. For chronic hardness-based metals, the hardness and metal concentrations are averaged for the calendar month. For mercury in fish tissue, the reach is considered nonsupporting if the species mean composite mercury concentration exceeds the WQS. A minimum of 3 fish per species are required to calculate a species mean. A minimum of 10 total fish are required to make a support determination for mercury in fish tissue for the waterbody. Additionally, a waterbody may be considered nonsupporting with less than the minimum data required if other overwhelming evidence suggest impairment.

To ensure a sufficient number of samples were available for each waterbody, the period of record considered for this report was from October 1, 2016 to September 30, 2021 (5 years unless otherwise noted) for streams, and October 1, 2011 to September 30, 2021 (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.

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, other overwhelming evidence, and best professional judgment.

Stream Assessment Methodology for Nutrient-Related Narrative Standards

EPA considers nutrient pollution one of the nation's top water quality priorities. The agency has called upon states to increase efforts to address nutrient pollution. Item #3 in EPA's 2014 Integrated Report 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 based criteria to assess attainment of applicable narrative standards and associated beneficial uses.

South Dakota has several narrative water quality standards in ARSD (Chapters; 74:51:01:05, 74:51:01:06, 74:51:01:08, 74:51:01:09, 74:51:01:10, and 74:51:01:12) designed to protect surface waters from nutrient-related impacts. Narrative standards lack general criteria to determine attainment. DANR developed a decision tree-based stream assessment method with multiple lines of evidence to determine attainment of applicable narrative standards and associated designated uses. The assessment criteria identify the applicable stream population, minimum data requirements, numeric targets and other actions required in the decision process.

The assessment is structured to identify streams which exceed regional reference-based nutrient (nitrogen and phosphorus) targets as an initial screening mechanism. Further evaluation of those waters is conducted using measures of ecological integrity and associated targets (Tables 5 and 6). The methodology provides a mechanism for which to evaluate nutrient impacts as well as impacts from multiple environmental stressors. When a stream assessment unit is considered to not meet applicable narrative standards it will be placed on the 303(d) list with cause “unknown” until a stressor analysis or TMDL analysis can determine the pollutant (i.e. nutrients) or pollutants impairing designated aquatic life uses.

The assessment methodology applies exclusively to wadeable-perennial streams in level III Ecoregions 43 and Ecoregion 46, with the exception, of those in level IV Ecoregion 46c (Appendix E). Limitations associated with evaluating all stream assessment units statewide are based on the availability of regional and/or site-specific assessment tools. Building a reference site network and bioassessment capacity at the statewide level is a long-term goal. As regional assessment tools become available, the assessment methodology will evolve accordingly.

Table 5: Assessment Methodology for Nutrient-Related Narrative Standards for Applicable Wadeable Streams in Ecoregions 43 and 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 Ecoregions 43 or 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 or total nitrogen concentration above the targets?	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 is calculated: Are 2-of-3 scores meeting the impairment thresholds? Invert and Fish IBI score >50 Habitat Condition score >50	No	List as Nonsupporting 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 the necessary Invertebrate IBI, Fish IBI and Habitat Condition scores to make a final support/impairment determination. It may also imply reassessment is necessary to make a final determination.
Yes	No	List as Nonsupporting
Assessment unit is not impaired.		

DANR is currently building a reference site network for wadeable-perennial streams in ecoregions 43 and 46. The reference site network will be used to establish water quality targets and criteria for making water quality-based decisions. In the interim, DANR relied on literature-based nutrient targets developed at a larger regional scale (Table 6). Nutrient targets were derived from data collected as part of EPA's National Aquatic Resource Surveys. Nitrogen and phosphorus targets were based on the 75th percentile of the reference site data within EPA nutrient regions which correspond to Ecoregions 43 and 46 in South Dakota (Herlihy and Sifneos 2008).

Table 6: Nutrient Targets for Streams in Ecoregions 43 and 46

Nutrient Region	Level III Ecoregion in SD	Total Phosphorus mg/L	Total Nitrogen mg/L
Grass Plains	43	0.18	2.5
Temperate Plains	46	0.087	0.93

A minimum of twenty samples collected in the most recent 5-year period (2016-2021) were required to generate an average concentration to initiate the screening portion of the assessment. If the average nutrient concentration(s) exceeded the targets further evaluation was required using measures of ecological integrity. If macroinvertebrate and fish Index of Biotic Integrity (IBI) scores were not available the assessment unit was placed in user-defined subcategory 2N, indicating further assessment is required. An assessment unit was also placed in subcategory 2N if macroinvertebrate and fish IBI scores conflicted and a Habitat Condition Index (HCI) score was not available. When IBI and/or HCI values were borderline (45-49) the water was also assigned to subcategory 2N to imply a reassessment will be conducted prior to a determination. A use support determination was not made for assessment units based solely on meeting the nutrient targets. DANR considers waters in subcategory 2N a top priority for ecological assessment.

Macroinvertebrate and fish community health provide the primary basis for determining attainment of applicable narrative standards. Macroinvertebrates and fish provide a more holistic representation of overall biotic health. Both communities integrate the effects of multiple stressors overtime at different trophic levels. An Index of Biotic Integrity (IBI) was developed for wadeable streams in ecoregions 43 and 46 following processes described in Whittier et al. (2007). An IBI integrates sensitive measures of community structure and function capable of discriminating between good and poor biological health. Core metrics scores are summed and scaled to provide a single IBI score that ranges from 100 to 0, with 100 being best condition. An IBI score of less than 50 was used to indicate poor biological health.

A quantified measure of habitat condition was also used as a line of evidence especially if the fish and macroinvertebrate IBI scores display conflicting status. Habitat condition can provide an indication 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. An HCI score was developed using core habitat metrics that highly correlated with fish and macroinvertebrate metrics. The HCI scoring convention was developed using the same processes used for IBI development (Whittier et al. 2007). The HCI scores are scaled from 100 to 0 to quantify overall habitat condition. An HCI score of less than 50 signifies poor habitat condition.

Due to travel restrictions from Covid-19 in 2020 and a drought year in 2021, no new 2N assessments have been completed. Therefore, the 2N assessment information below is the same as what was supplied in the 2020 Integrated Report. Twenty-five stream assessment units met the criteria to be assessed for nutrient-related narrative standards in ecoregion 46 (Table 7). Twenty of the twenty-five assessment units had average nitrogen or phosphorus concentrations above the respective targets. Fourteen of the assessment units have IBI and or HCI scores available. Twelve segments meet the criteria and are considered fully supporting and thirteen remain in Category 2N requiring further assessment.

Table 7: Nutrient-related Assessment Status of Stream Assessment Units in Ecoregion 46 in Eastern, South Dakota

Assessment Unit Identifier (AUID)	TN or TP less than Target	IBI/HCI Available	Assessment Status
SD-BS-R-SKUNK_01	NO	YES	Full Support
SD-BS-R-BIG_SIOUX_01	YES	YES	Full Support
SD-BS-R-BEAVER_01	NO	NO	Category 2N
SD-BS-R-MEDARY_01	NO	NO	Category 2N
SD-BS-R-SIXMILE_01	NO	NO	Category 2N
SD-BS-R-STRAYHORSE_01	NO	NO	Category 2N
SD-JA-R-ELM_01	NO	YES	Category 2N
SD-JA-R-FIRESTEEL_01	NO	YES	Category 2N
SD-JA-R-MAPLE_01	NO	NO	Category 2N
SD-JA-R-PIERRE_01	NO	NO	Category 2N
SD-JA-R-TURTLE_01	NO	NO	Category 2N
SD-JA-R-WOLF_01	NO	YES	Full Support
SD-JA-R-WOLF_02	NO	YES	Full Support
SD-JA-R-WOLF_SP_01	NO	YES	Category 2N
SD-MN-R-LAC_QUI_PARLE_W_BR_01	YES	NO	Full Support
SD-MN-R-LITTLE_MINNESOTA_01	YES	NO	Full Support
SD-MN-R-WHETSTONE_01	NO	YES	Full Support
SD-MN-R-WHETSTONE_N_FORK_01	NO	NO	Category 2N
SD-MN-R-WHETSTONE_S_FORK_01	YES	YES	Full Support
SD-MN-R-WHETSTONE_S_FORK_02	NO	YES	Full Support
SD-MN-R-YELLOW_BANK_N_FORK_01	NO	YES	Full Support
SD-MN-R-YELLOW_BANK_S_FORK_01	YES	YES	Full Support
SD-VM-R-LONG_01	NO	NO	Category 2N
SD-VM-R-VERMILLION_E_FORK_01	NO	YES	Category 2N
SD-VM-R-VERMILLION_E_FORK_02	NO	YES	Full Support

Twenty-three stream assessment units met the criteria to be assessed for nutrient-related narrative standards in ecoregion 43 (Table 8). Twenty of the twenty-three assessment units had average nitrogen or phosphorus concentrations above the respective targets. Five assessment units have IBI and or HCI scores available. Five segments meet the criteria and are considered fully supporting and eighteen remain in Category 2N requiring further assessment.

Table 8: Nutrient-related Assessment Status of Stream Assessment Units in Ecoregion 43 in Western, South Dakota

Assessment Unit Identifier (AUID)	TN or TP less than Target	IBI/HCI Available	Assessment Status
SD-BF-R-REDWATER_01	NO	NO	Category 2N
SD-BF-R-WHITEWOOD_07	NO	NO	Category 2N
SD-CH-R-CHEYENNE_02	NO	YES	Full Support
SD-CH-R-CHEYENNE_03	NO	NO	Category 2N
SD-CH-R-RAPID_04	NO	NO	Category 2N
SD-CH-R-RAPID_05	NO	NO	Category 2N
SD-GR-R-GRAND_01	NO	NO	Category 2N
SD-GR-R-GRAND_03	NO	NO	Category 2N
SD-GR-R-GRAND_N_FORK_01	NO	NO	Category 2N
SD-GR-R-GRAND_S_FORK_01	NO	YES	Category 2N
SD-GR-R-GRAND_S_FORK_02	NO	NO	Category 2N
SD-LM-R-LITTLE_MISSOURI_01	NO	YES	Full Support
SD-MI-R-CROW_01	NO	NO	Category 2N
SD-MU-R-MOREAU_01	NO	NO	Category 2N
SD-MU-R-MOREAU_03	NO	NO	Category 2N
SD-MU-R-RABBIT_01	NO	NO	Category 2N
SD-WH-R-LITTLE_WHITE_01	NO	NO	Category 2N
SD-WH-R-WHITE_01	NO	YES	Category 2N
SD-WH-R-WHITE_02	NO	YES	Category 2N
SD-WH-R-WHITE_03	NO	NO	Category 2N
SD-CH-R-BEAVER_01	YES	NO	Full Support
SD-CH-R-FALL_01	YES	NO	Full Support
SD-CH-R-RAPID_03	YES	NO	Full Support

Lake Assessment Methodology for Numeric Standards

DANR's Watershed Protection Program is responsible for lake water quality monitoring in South Dakota. Lake water quality data is generated from various projects and partnerships in accordance with project specific Quality Assurance Project Plans (QAPPs) https://danr.sd.gov/Conservation/WatershedProtection/ReportsPublications.aspx.
All applicable lake water quality data acquired from the following projects was used in the lake assessment process:

Statewide Lakes Assessment Project
Watershed Protection Program implements a targeted approach to monitor lakes in the state. All lakes with AUIDs represent the core population. The current goal is to sample 35 lakes per year at a minimum of three times during the growing season. Annual lake selection is based on priority criteria and a tiered approach to allow flexibility https://danr.sd.gov/Conservation/WatershedProtection/Projects/StatewideLakeAssessment.aspx.

Regional Rotating Basin Assessment Project
The goal of the Regional Rotating Basin Assessment Project is to monitor all lake and stream AUIDs over a ten-year period. A document describing the project is expected to be available on the Watershed Protection Program website in early 2022 (https://danr.sd.gov/Conservation/WatershedProtection/default.aspx).
Lakes in the Big Sioux, Red, and Minnesota basins were monitored monthly (May-September) during the 2020 and 2021 growing seasons by East Dakota Water Development District as part of Rotation 1. Rotation 2 is expected to begin in the Belle Fourche and Upper Cheyenne River basins in the spring of 2022.

Volunteer Monitoring Project
The South Dakota Discovery Center and Watershed Protection Program coordinate a water quality monitoring program for volunteers. Funding assistance, recruitment and coordination is provided by the Discovery Center and the Watershed Protection Program provides oversight and technical assistance https://danr.sd.gov/Conservation/WatershedProtection/VolunteerActivities.aspx.

Section 319 Nonpoint Source Assessment Projects and External Data
Water quality data for lakes and streams may be generated from Section 319 NPS implementation projects. Water quality monitoring is generally conducted on a site-specific basis within a project area to evaluate BMP effectiveness. Water quality data is also used when available from external sources (i.e., outside entities) if data meets QA requirements in accordance with DANR's external party QAPP https://danr.sd.gov/Conservation/WatershedProtection/docs/externalpartyqapp.pdf.

Conventional Numeric Water Quality Standards Assessment

Water quality parameters collected during monitoring efforts are generally consistent with numeric standards assigned to protect designated beneficial uses of lakes (ARSD 74:51:02). Water quality data is comprised of parameters associated with water samples (nitrate, ammonia-N, total suspended solids, total dissolved solids, alkalinity and *E. coli*) and water column profile measurements (water temperature, dissolved oxygen, specific conductance and pH). Chlorophyll-a is also collected in conjunction with nutrients (nitrogen and phosphorus) to address nutrient-related narrative standards.

Numeric water quality standards are used as benchmarks to make support determinations and 303(d) impairment decisions. Lake assessments were conducted in accordance with the following minimum criteria:

Minimum assessment criteria for conventional numeric water quality standard parameters

- Two years of data available within the 10-year assessment period (10/1/2011 to 10/1/2021).
- At least two individual sample events per year.
- 10% exceedance ≥ 20 samples or 3 exceedances when *10-19 samples available.
- Toxic parameters (i.e., Ammonia-N); more than one exceedance in a three-year period.

* When <10 samples were available an assessment decision was based on overwhelming evidence:

- Meet criteria; 0 to 1 exceedance when 5 to 9 samples available.
- Criteria not met; 3 exceedances when 5 to 9 samples available.
- Insufficient data; < 5 samples available.

If an assessment decision could not be reached, the waterbody is considered for future monitoring in the interim of the next IR cycle. This applies mainly to water sample based parameters (i.e., *E. coli*) as water column profile measurements are collected at a higher rate (multiple measurements) during individual lake visits.

Water column profile data is pooled from multiple stations and assessed in accordance with minimum assessment criteria. Surface temperature and pH values are not included in the cumulative profile datasets to avoid anomalous values associated with environmental conditions at the air-water interface. In addition, bottom dissolved oxygen measurements in shallow well-mixed lakes were excluded from the assessment 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 (ARSD 74:51:01:45-51).

If thermal stratification was not well defined, an alternate process was used to define the epilimnetic zone. 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 and metalimnion.

Nutrient-Related Narrative Standards Assessment

Nitrogen and phosphorus are essential nutrients in aquatic food webs. Aquatic organisms such as blue-green algae require nitrogen and phosphorus for growth and maintenance. Blue-green algae can reach nuisance bloom levels when excessive nutrient loading occurs from internal (in lake) and external (watershed) nonpoint sources. Blue-green algae blooms can directly impact aquatic life and recreation with implications to human, pet and livestock health (i.e., cyanotoxins) https://danr.sd.gov/Conservation/WatershedProtection/HAB.aspx.

South Dakota has several narrative water quality standards (ARSD Sections 74:51:01:05, 74:51:01:06, 74:51:01:08, and 74:51:01:012) designed to protect beneficial uses of surface waters from nutrient-related impacts. Narrative standards lack numeric targets and criteria necessary to make beneficial use support determinations and impairment decisions. Thus, a quantitative assessment methodology was developed to assess nutrient-related narrative standards and associated aquatic life and recreation uses designated to lakes.

Chlorophyll-a targets-rationale and linkage
DANR collaborated with EPA Region 8 nutrient team and Tetra Tech Inc., to develop protective nutrient-related targets and assessment criteria for lakes in South Dakota. Target development focused on algae response to nutrients (i.e., nitrogen and phosphorus). Chlorophyll-*a* provides a surrogate for algae production. It is cost effective to collect and process and is an important predictor of bloom density and blue-green algae dominance. Chlorophyll-*a* is directly linked to nutrient pollution and impacts to nutrient-related narrative standards and associated designated aquatic life and recreation uses of waters.

Regional Chlorophyll-a Targets
Waterbodies were classified based on similarities in nutrients and nutrient response (i.e., blue-green algae density and dominance) in relation to physical factors at the lake and watershed scale to minimize natural variability among waterbodies across the state. Classification resulted in grouping waterbodies into 3 distinct classes; Black Hills Lakes, Western Lakes and Eastern Lakes which closely follow Level III ecoregions (Appendix E). In general, Black Hills Lakes have lower nutrient concentrations and associated productivity than waterbodies west and east of the Missouri River (i.e., nutrient gradient). Waterbodies east of the Missouri River are the most productive systems capable of producing significant blue-green algae blooms at relatively high frequency.

Numeric chlorophyll-a targets and criteria were developed for each regional lake class. Chlorophyll-a targets are expressed as a growing season average despite the use of median in target development (Black Hills and Western Lake classes). In general, growing season median and average values among lakes in all classes were similar. When the two measures deviate significantly, the median values tend to be lower suggesting the average criterion is protective of median derived targets. A decision was made to use the average growing season criterion as the basis to assess chlorophyll-*a* for each lake class to maintain consistency.

Black Hills Lakes-Level III ecoregion 17

Chlorophyll-*a* targets for Black Hills lakes were derived using a reference condition approach https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_2020_IR_final.pdf.
Black Hills lakes were classified as large or small based on physical characteristics (size, depth, and retention time). Chlorophyll-*a* targets were based on median growing season values calculated from reference lakes in each size class:

- Large waterbodies: average growing season chlorophyll-*a* $\leq$ 7 µg/L.
- Small waterbodies: average growing season chlorophyll-*a* $\leq$ 8 µg/L.

The Black Hills Lake targets are designed to protect waterbodies designated with cold water fish life and recreation uses from nutrient-related impacts. Average growing season chlorophyll-a targets for Black Hills Lakes correspond to low algae production with minimal blue-green algae composition and very low risk of cyanotoxin production. During the 2022 reporting cycle zero lakes in the Black Hills class did not meet nutrient-related narrative standards associated with designated aquatic life and recreation uses due to chlorophyll-*a*. Five lakes had insufficient information for chlorophyll-a.

Western Lakes-Level III ecoregions 25, 43, 44

The Western Lakes chlorophyll-a target was derived from the interquartile range of a subset of lakes in the population considered to have low bloom frequency characteristics as defined by chlorophyll-*a* concentrations where <25% of the values exceed a bloom level of 30 µg/L https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/docs/DANR_2020_IR_final.pdf.

- Western Lakes: average growing season chlorophyll-*a* ≤ 14 µg/L.

The Western Lakes chlorophyll-*a* target intends to protect waterbodies designated with warmwater fish life propagation and recreation uses from experiencing frequent algae blooms dominated by blue-green algae and maintaining low risk cyanotoxin production. During the 2022 reporting cycle, five lakes in the Western class did not meet nutrient-related narrative standards associated with designated aquatic life and recreation uses due to chlorophyll-*a*.

Eastern Lakes-Level III ecoregions 42, 46, 47

Data analysis efforts (i.e., stressor-response analysis) did not yield a definitive chlorophyll-a target for the Eastern Lakes class. The response of chlorophyll-*a* to nutrients across the total population was abated by variation from other factors at the lake and watershed scale (size, depth, wind-waves, abiotic turbidity, light attenuation, N:P, watershed size, lake: watershed ratio). Several analysis techniques were used to correct for these sources of variation. Results provided a range of potential targets (i.e. 6 to 50 µg/L) which was used in the final decision process.

During the target development process, significant emphasis was placed on a chlorophyll-*a* concentration of 30 µg/L. A chlorophyll-a concentration of 30 µg/L indicates a moderate bloom level with increased incidence of blue-green algae domination and moderate risk of cyanotoxin production (MPCA, 2005, WHO, 2003 and Downing et al. 2001). An average growing season chlorophyll-a concentration above 30 µg/L can indicate frequent occurrence of blue-green algae blooms and moderate to high risk of cyanotoxin. The goal was to set an average growing season chlorophyll-a target for Eastern Lakes below 30 µg/L.

Chlorophyll-a targets for Eastern Lakes were adopted from criteria developed by the Minnesota Pollution Control Agency (MPCA) https://www.pca.state.mn.us/sites/default/files/wq-lar3-01.pdf. MPCA's regional nutrient criteria and targets were developed using a robust multiple line of evidence approach. MPCA's chlorophyll-*a* targets for waterbodies in the Northern Glaciated Plains (NGP) ecoregion (46) were considered applicable to the Eastern Lakes class due to similarities observed during the classification process. DANR used MPCA's rationale and chlorophyll-a targets for waterbodies in the NGP as the basis for setting protective targets for the Eastern Lakes class:

- Deep lakes (>15' max depth): average growing season chlorophyll-*a* ≤ 20 µg/L.
- Shallow lakes (≤15' max depth): average growing season chlorophyll-*a* ≤ 25 µg/L.

Eastern Lakes chlorophyll-*a* targets intend to protect waterbodies designated with warmwater fish life propagation and recreation uses from experiencing frequent algae blooms dominated by blue-green algae at densities consistent with low to moderate risk of cyanotoxin production. During the 2022 reporting cycle, 34 lakes in the Eastern class did not meet nutrient-related narrative standards associated with designated aquatic life and recreation uses due to chlorophyll-*a*.

An average growing season chlorophyll-a target of < 10 µg/L was used for waterbodies designated the Domestic Water Supply use unless a more stringent target was available (i.e., Black Hills lakes) (2020 IR).

The following defines the minimum criteria used to assess waterbodies for nutrient-related narrative standards using regional numeric chlorophyll-a targets:

- Indicator: Chlorophyll-*a* (corrected for pheophytin)
- Growing season: defined as May 1st to September 30th.
- Average growing season: calculated from a minimum of 3 samples collected throughout the growing season.
- Nonsupport: occurs when two or more average growing season chlorophyll-a values exceed the regional target in a 10-year assessment period.
- Applicable beneficial uses: warm and coldwater aquatic life propagation, recreation and domestic water supply uses.

Microcystin and Cylindrospermopsin-Recreation Assessment

Many species of blue-green algae can produce toxins (cyanotoxin) which can be harmful to human health. The Watershed Protection Program integrated cyanotoxin monitoring into lake assessment projects during the 2020 field season and beyond to better understand the prevalence of HABs in recreation waters.
https://danr.sd.gov/Conservation/WatershedProtection/docs/HABsResponse.pdf.

Cyanotoxin monitoring results are presented in an interactive HABs web map to provide water resource managers and the public with data to inform recreation-based decisions and response pathways.
https://sdbit.maps.arcgis.com/apps/webappviewer/index.html?id=ec7a545532a24a3599a46cee428def48

EPA recently finalized "Recommended Human Health Recreational Ambient Water Quality Criteria or Swimming Advisories for Microcystins and Cylindrospermopsin" https://www.epa.gov/sites/default/files/2019-05/documents/hh-rec-criteria-habs-document-2019.pdf. DANR adopted EPA recommended standards and criteria for Microcystin and Cylindrospermopsin to protect waters designated the immersion and limited contact recreation uses (ARSD 74:51:01:50-51)
https://sdlegislature.gov/Rules/Administrative/28278:
https://sdlegislature.gov/Rules/Administrative/28279:

- * Microcystin ≤ 8 µg/L
- * Cylindrospermopsin ≤ 15 µg/L

*Not to be exceeded in more than three 10-day assessment periods over the course of the recreation season.

EPA also finalized guidance to assist states and authorized tribes with implementing cyanotoxin standards and criteria to protect recreation based human health
https://www.epa.gov/system/files/documents/2021-08/final-tsd-implement-2019-rwqc.pdf.pdf.
The document provides flexible recommendations for using monitoring data and information (i.e., advisories-notifications) to make 303(d) listing decisions. The following methodology was derived

from recommendations described in the document with a focus on magnitude, duration and frequency criteria (Table 9).

Table 9: Recreation-based Lake Assessment Criteria for Microcystin and Cylindrospermopsin

Microcystin Magnitude (µg/L)	Cylindrospermopsin Magnitude (µg/L)	Duration	Frequency
8	15	1 in 10-day assessment period across recreation season	Not more than 3 excursions in a recreation season in more than 3 years within a 10-year assessment period

An excursion is defined as a 10-day assessment period with a single toxin concentration or sample exceeding the standard. An excursion is also synonymous with notifications (i.e., advisories) which are posted on the Watershed Protection Programs HABs web page and interactive web map. The assessment method was designed to account for variability in blue-green algae blooms and associated toxin production within and between years. The frequency and duration components provide an indication of excursion pattern within a recreation season across multiple years. Waterbodies designated the immersion and limited contact recreation uses are considered impaired if 3 excursions occur during the growing season in more than 3 years within a 10-year assessment period. No waterbodies were assessed during the 2022 reporting period because microcystin and cylindrospermopsin monitoring results have only been available since the 2020 growing season.

Assessment Categories

South Dakota uses assessment categories recommended in EPAs 2006 IR guidance document. DANR added user-defined subcategories 2N and 2Hg. South Dakota's assessment categories are described below:

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;
Subcategory 2Hg:	Meets water quality criterion for mercury in fish tissue, but has insufficient data to determine if remaining uses are met;
Category 3:	Insufficient data to determine whether any designated uses are met;
Category 4A :	Water is impaired but has an EPA approved TMDL;
Category 4B:	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 and a TMDL is needed.

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

STATEWIDE SURFACE WATER QUALITY SUMMARY

Approximately 5,888 miles of rivers and streams have been assessed to determine water quality status for a period covering the last five years (October 2016 through September 2021). 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, 21.8% of the assessed stream miles fully support all assigned beneficial uses. Nonsupport in assessed streams was caused primarily by *E. coli* bacteria from agricultural nonpoint sources and wildlife. In order of stream miles affected, causes of impairment this reporting cycle include: *E. coli,* TSS, sodium adsorption ratio (salinity), specific conductivity, mercury in fish tissue, dissolved oxygen, total dissolved solids, temperature, pH, cadmium, and selenium.

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. *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.

On a positive note, 100 percent of stream miles assessed for alkalinity, ammonia, arsenic, chloride, chromium, copper, lead, mercury, nickel, nitrate, radium, silver, uranium, sulfate, and zinc met associated water quality standards as shown in Tables 10 and 11.

Table 10: 2022 Category Status for Rivers and Streams in South Dakota vs 2020

2022			2020		
EPA Category	Total Size (miles)	Number of Assessment Units	EPA Category	Total Size (miles)	Number of Assessment Units
1	1,116	49	1	1,271	54
2	167	4	2	12	2
3	318	13	3	316	13
4A	883	27	4A	804	20
4B	0	0	4B	0	0
4C	0	0	4C	0	0
5	3,722	95	5	3,788	97

Table 11: 2022 Parameters Supporting Uses for Streams

Parameter	Stream Miles Not Supporting	Stream Miles Supporting	Number of Streams Not Supporting	Number of Streams Supporting	Percent Miles Supporting
Alkalinity	0	671	0	28	100
Ammonia	0	5,487	0	157	100
Arsenic	0	434	0	27	100
Chloride	0	145	0	5	100
Chromium	0	88	0	17	100
Copper	0	90	0	18	100
Cyanide	0	17	0	5	100
Lead	0	90	0	18	100
Mercury, Total	0	88	0	17	100
Nickel	0	90	0	18	100
Nitrate	0	5,517	0	160	100
Radium	0	344	0	9	100
Silver	0	90	0	18	100
Sulfate	0	145	0	5	100
Zinc	0	90	0	18	100
Uranium	0	309	0	7	100
pH	71	5,563	4	162	99
Cadmium	2	88	1	17	98
Temperature	148	5,448	4	158	97
Total Dissolved Solids	364	5,027	9	150	93
Dissolved Oxygen	402	5,178	13	148	93
Specific Conductivity	605	5,020	12	153	89
Salinity/ Sodium Adsorption Ratio	778	3,490	13	77	82
Selenium	1	2	1	1	66
Total Suspended Solids	1,990	3,537	50	115	64
Mercury in Fish Tissue	556	750	6	14	57
Escherichia coli	2,657	2,507	79	74	49

Mileage values were generated by ATTAINS and the values were rounded to the nearest whole number. If a stream segment was impaired for multiple beneficial uses, the mileage associated with the stream segment was only counted once.

Some parameters may meet for some uses but not for others. For example, the *E. coli* limited contact recreation standard is 1,178 cfu/100 mL while the immersion recreation daily maximum standard is 235 cfu/100 mL. A stream could easily meet the limited contact but not the immersion recreation standard. Table 12 summarizes the percent of stream miles meeting each beneficial use.

Table 12: Rivers and Streams Beneficial Uses by Stream Miles

Use	Supporting	Nonsupporting
(1) Domestic Water Supply	82.8%	17.2%
(2) Coldwater Permanent Fish Life	48.9%	51.1%
(3) Coldwater Marginal Fish Life	95.6%	4.4%
(4) Warmwater Permanent Fish Life	45.8%	54.2%
(5) Warmwater Semipermanent Fish Life	41.1%	58.9%
(6) Warmwater Marginal Fish Life	74.5%	25.5%
(7) Immersion Recreation	42.9%	57.1%
(8) Limited Contact Recreation	59.1%	40.9%
(9) Fish, Wildlife Prop, Rec and Stock Watering	86.5%	13.5%
(10) Irrigation	78.9%	21.1%
(11) Commerce and Industry	100.0%	0.0%

South Dakota has 584 lakes and reservoirs listed in ARSD Chapter 74:51:02 with specific aquatic life and recreation beneficial uses. These lakes total approximately 243,848 acres. GF&P presently manages approximately 500 lakes for recreational fishing. The 2022 Integrated Report contains assessments for 145,009 lake acres using water quality data collected from October 2011 through September 2021.

Excluding the four Missouri River reservoirs, an estimated 30% of the lakes and reservoirs have been assessed, accounting for 59% of the total lake acreage. An estimated 29.6% of the lake acreage was considered to support all assessed beneficial uses. Considering approximately 71% of lake acres assessed for mercury in fish tissue do not meet the water quality criterion, it is logical that the percentage of lakes acres meeting all uses will decline as more lakes are assessed for mercury in fish tissue. While many factors influence mercury methylation and bioaccumulation rates, the sources of mercury in fish tissue are mostly atmospheric deposition from sources outside of South Dakota. DANR completed and received final EPA approval for a statewide mercury TMDL, which included 75 waters not supporting the mercury in fish tissue standard. Based on lake acreage, the primary causes of nonsupport are mercury in fish tissue, chlorophyll-*a*, *E. coli* bacteria, pH, dissolved oxygen, salinity/SAR, and temperature. In general, nonsupport is attributed to nonpoint source pollution while temperature and salinity/SAR are attributed to natural sources.

Many lakes and reservoirs meet water quality standards associated with designated uses. 48% of lake acres assessed were considered to fully support the immersion recreation and limited contact uses. In addition, 100% of the assessed lake acreage complied with alkalinity, ammonia, and total suspended solids, and nearly 100% of acres met standards for specific conductance, total dissolved solids, and nitrates as shown in Tables 13 and 14.

Table 13: 2022 Category Status for Lakes in South Dakota vs 2020

2022			2020		
EPA Category	Total Size (acres)	Number of Assessment Units	EPA Category	Total Size (acres)	Number of Assessment Units
1	37,171	29	1	10,343	15
2	5,741	18	2	1,515	3
3	8,971	12	3	16,173	32
4A	40,535	45	4A	60,037	56
4B	0	0	4B	0	0
4C	0	0	4C	0	0
5	61,561	84	5	62,465	73

The general statistics reported are intended to characterize category status and causes of nonsupport for the 2022 reporting cycle. Many lake assessments were performed in the late 1990s and early 2000s. However, that data does not meet data age requirements to make waterbody support determinations. Also, DANR is moving from a random design for the statewide lake assessment to a more targeted approach assisted by the rotating basin approach. With these changes in sampling design, DANR will be better able to make support determinations on lakes.

Table 14: 2022 Parameters Supporting Uses for Lakes

Parameter	Acres Not Supporting	Acres Supporting	Lakes Not Supporting	Lakes Supporting	Percent Acres Supporting
Alkalinity	0	111,979	0	103	100
Ammonia	0	110,852	0	97	100
Total Suspended Solids	0	116,621	0	105	100
Specific Conductivity	50	117,010	1	104	99.9
Total Dissolved Solids	50	116,378	1	101	99.9
Nitrate	50	111,246	1	100	99.9
Temperature	2,697	100,699	19	81	97.4
Dissolved Oxygen	8,286	109,162	24	86	92.9
pH	9,413	106,658	22	86	91.9
Escherichia coli	9,970	89,254	5	74	90.0
Chlorophyll-a	44,228	38,982	39	32	46.8
Mercury in Fish Tissue	79,238	33,018	71	48	29.4
Selenium	50	0	1	0	0
Salinity/SAR	5,076	0	1	0	0

Acreage values are generated by ATTAINS and are rounded to the nearest whole number. If a lake was impaired for multiple beneficial uses, the lake acreage was only counted once.

Some parameters may meet for some uses but not for others. For example, the pH aquatic life use standard is less than 9.0 units while the fish, wildlife, recreation and stock watering standard is less than 9.5 units. A lake could easily meet the fish, wildlife, recreation, and stock watering standard but not the aquatic life use standard. Table 15 summarizes the percent of lake acres meeting each beneficial use.

Table 15: Lakes Beneficial Use Status by Acres

Use	Supporting	Nonsupporting
(1) Domestic Water Supply	88.3%	11.7%
(2) Coldwater Permanent Fish Life	0.0%	100.0%
(3) Coldwater Marginal Fish Life	4.9%	95.1%
(4) Warmwater Permanent Fish Life	34.8%	65.2%
(5) Warmwater Semipermanent Fish Life	22.2%	77.8%
(6) Warmwater Marginal Fish Life	36.0%	64.0%
(7) Immersion Recreation	50.6%	49.4%
(8) Limited Contact Recreation	51.0%	49.0%
(9) Fish, Wildlife Prop, Rec and Stock Watering	44.2%	55.8%
(10) Irrigation	82.6%	17.4%

Most lakes and reservoirs in the state are characterized as eutrophic to hypereutrophic. They tend to be shallow, turbid, and well-supplied with dissolved salts, nutrients, and organic matter. These lakes have 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.

LAKE WATER QUALITY ASSESSMENT

A total of 584 lakes and reservoirs are currently designated with the beneficial uses of recreation and warmwater or coldwater fish life use in South Dakota. Forty-four assessed lakes in South Dakota have a surface area greater than 1,000 acres and have a combined surface area of 160,765 acres. Lake monitoring and assessment efforts have been conducted routinely since 1989 as part of the DANR's SWLA project. Additional lake data have also been acquired from individual assessment projects and citizens' monitoring efforts. Approximately 30% of the 584 lakes have been assessed, accounting for 59% of the total lake acreage.

Water quality standards were evaluated for each lake in accordance with applicable assessment methodologies. The assessment results suggest 47 lakes fully support all assessed beneficial uses and 129 failed to support one or more beneficial uses. Twelve lakes had insufficient data to determine use support.

The low number of lakes and reservoirs meeting all assigned beneficial uses is mostly due to mercury in fish tissue. Prior to the 2016 reporting cycle, only 18 lakes were considered nonsupporting for mercury based on fish consumption advisories. In 2016, DANR adopted EPA's mercury in fish tissue criterion of 0.3 mg/kg. In 2020, 15% of lake acres assessed supported aquatic life uses for mercury in fish tissue. In 2022, DANR worked with EPA to improve the assessment methodology to better follow EPA guidance. This update in methodology resulted in a greater number of lake acres (29.4%) meeting the mercury in fish tissue water quality criterion than in previous cycles. The increase in beneficial use support for mercury in fish tissue is attributable to changes in the assessment of the data, not actual changes in mercury in the environment or in fish tissue. DANR received EPA approval for a statewide mercury TMDL in 2016, which included 75 waters not supporting mercury in fish tissue. The TMDL documented that the primary source of mercury in South Dakota comes from global atmospheric deposition. Therefore, the high incidence of nonsupport for lakes is not likely to improve until measures to reduce mercury are implemented at a global scale. DANR has provided amendments to the TMDL to include waterbodies that were not included in the 2016 approval.

Another main cause of nonsupport continues to be excessive algae due to nutrient enrichment from watershed scale nonpoint sources and internal loading. More than half of lake acres assessed are nonsupporting for chlorophyll-a. Dissolved oxygen problems are caused by excess plant and microbial life decaying and respiring during the night. 7.4% of lake acres are impaired for dissolved oxygen. Likewise, high pH above 9.0 may indicate nutrient problems related to excess productivity. About 8.5% of lake acres assessed have been shown to have high pH problems.

A Trophic State Index (TSI) approach was used to determine the trophic (productivity) status of assessed lakes (Carlson, 1977). The primary trophic state indicators are phosphorus, Secchi depth transparency and chlorophyll-a. Carlson (1991) suggests the chlorophyll-a index (TSI Chl-a) provides the best measure of lake productivity and trophic state. The median TSI-chlorophyll was used to classify the trophic status of assessed lakes and reservoirs in South Dakota (Table 16). One hundred twenty-two lakes were assessed based on two years of data in the past 15 years (Table 16).

Table 16: Trophic Status of Assessed Lakes

TSI Chl-a	Chl-a ug/L	Classification		Number of Lakes	Lake acreage	Percent of assessed acres
<30	0.95	Oligotrophy	O	0	0	0%
30-40	.95-2.6		O	5	939	1%
40-50	2.6-7.3	Mesotrophy	M	14	25,363	17%
50-60	7.3-20	Eutrophy	E	41	34,753	23%
60-70	20-56		E	46	42,028	28%
70+	>56	Hypereutrophy	H	16	15,914	11%
		unknown	U	57	31,537	21%

DANR adjusted the TSI Chl-a classification scale to the thresholds reflected in Table 17 for more uniform reporting. Oligotrophy was previously cut off at a TSI Chl-a of 35 it is now revised to 40. The eutrophy-hypertrophy threshold was previously at 66 and is now 70.

Table 17: Trophic State Descriptions

TSI	Chl (ug/L)	SD (m)	TP (ug/L)	Attributes
<30	<0.95	>8	<6	**Oligotrophy:** Clear water, oxygen throughout the year in the hypolimnion
30-40	0.95-2.6	4-8	6-12	Hypolimnion of shallower lakes may become anoxic
40-50	2.6-7.3	2-4	12-24	**Mesotrophy:** Water moderately clear; increasing probability of hypolimnetic anoxia during summer
50-60	7.3-20	1-2	24-48	**Eutrophy:** Anoxic hypolimnia, macrophyte problems possible
60-70	20-56	0.5-1	48-96	Blue-green algae dominate, algal scums and macrophyte problems
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

(RMBEL https://www.rmbel.info/tsi/) After Moore, 1. And K. Thornton, [Ed.]1988. Lake and Reservoir Restoration Guidance Manual. USEPA>EPA 440/5-88-002.

The major water quality problems in South Dakota lakes continue to be excessive nutrients, and algae due to nonpoint source pollution (primarily agricultural). Nonpoint source runoff and internal phosphorus cycling 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.

Acid Effects on Lakes

During lake water quality assessments, each lake is measured for field pH. Monitoring efforts from 2011 to 2021 suggest none of the assessed lakes had acidic pH conditions (Table 18). DANR is not aware of any lakes in South Dakota that are currently impacted by acid deposition. The lack of acidity in South Dakota lakes is attributed to a lack of industrialization and a natural buffering capacity of the soils.

Table 18: Acid Effects on Lakes

	Number of Lakes	Acreage of Lakes
Assessed for pH	107	111,058
Impacted by Acidity (<6.5)	0	0
Vulnerable to Acidity (<6.5)	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 growing season (May-September) chlorophyll-a data available from 1989 to 2021. One hundred thirteen lakes were evaluated for Trophic State Index chlorophyll-a trends. The median growing season TSIs (chlorophyll-a) were calculated by lake for each year. The Kendall test for trend was applied to lakes with at least 5 years of data. Of the 113 lakes that were evaluated, 7 declined and 7 improved over the time period (Table 19). The trend in lake growing season chlorophyll-a TSI is not expected to change significantly in the interim of an IR cycle due to the lack of new data and short timeframe.

Table 19: Long Term Trends in Assessed Lakes (1989-2021)

	Number of Lakes	Lake Acreage
Assessed for Trends	113	114,026
Improving	7	6,330
No Trend	99	91,936
Degrading	7	15,760

STATE-SCALE STATISTICAL SURVEYS

The SD Department of Agriculture and Natural Resources has participated in the National Aquatic Resource Surveys (NARS) since the initial lakes survey was conducted in 2007. The NARS are statistically designed to assess the status of and changes in the water quality of several different aquatic resource types. Lakes and reservoirs are assessed through the National Lakes Assessment (NLA) whereas the rivers and stream through the National Rivers and Streams Assessment (NRSA). The large scale of these statistical surveys requires a significant collaborative effort involving EPA, states, and tribes and, because of this scale, they are completed only every 5-years. The NLA requires a full summers worth of field work with two summers needed for the NRSA. These surveys are designed in such a way so that the selected sites can be used to characterize the entire population at a national and ecoregional scale using chemical, physical, biological and human health indicators. They are not intended to assess the condition of individual lakes or rivers.

The NLA target population includes all permanent waterbodies, whether natural or man-made, with a surface area greater than 2.47 acres (1 hectare). The NRSA target population consists of all perennial rivers and streams within the 48 contiguous states that have flowing water during the study index period. The study index period extends from April/May to September and is generally characterized by low flow conditions. The design statisticians used the most recent version of the http://nhd.usgs.gov/ to randomly select the sites. Table 20 shows the year in which each resource survey was completed. The technical documents describing the survey designs in more detail can be found on the NARS website (https://www.epa.gov/national-aquatic-resource-surveys).

Table 20: NARS Survey Type with Year Completed and Total Sites Sampled in SD

Lakes (NLA)	Lakes Sampled	Rivers and Streams (NRSA)	River and Stream Segments Sampled
2007[1]	38	2008/2009[3]	65
2012[2]	44	2013/2014[2]	58
2017[2]	43	2018/2019[3]	58

[1]-Data available but not included because change in site selection process reduced comparability between survey years.
[2]-Data included in 2022 IR Cycle and will be used in subsequent cycles.
[3]-Data not available for 2022 IR cycle but will be available in subsequent cycles.

Although the sites are selected randomly there is also a spatial element involved in the selection process to ensure the density of selected sites, i.e. lakes or stream segments, reflects the spatial pattern (or density) of the resources. This means the sites selected are also dependent on the proximity of other sites relative to the geographic density of the resource.

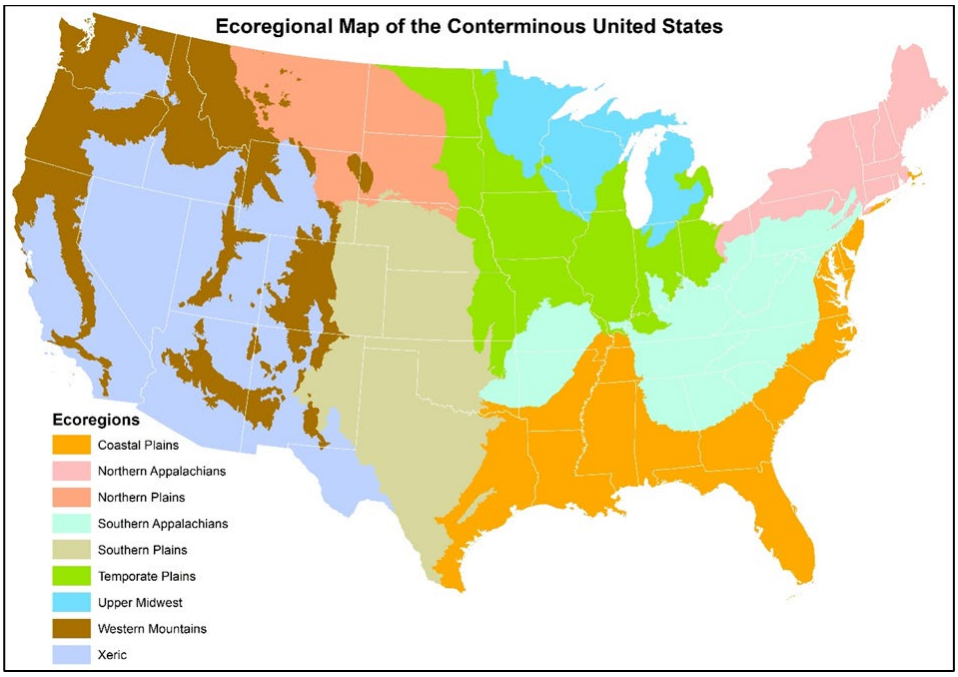

Figure 1: Ecoregions of Conterminous United States (Source USEPA).

To estimate the quality of the aquatic resource to within a ±5% margin of error and 95% confidence enough sites need to be sampled from the total national population. To report on a group from a smaller geographic scale, such as an ecoregional or state scale, a wider margin of error is necessary to maintain the 95% confidence for the water quality estimates. This is due to the fewer number of sites available for calculating the estimates. Waterbodies from the same ecoregion are grouped together because ecoregions have similar environmental characteristics such as climate, vegetation, soil type, and geology. Portions of four of the nine national aggregated ecoregions are found within SD (Figure 1). They include the western mountains (Black Hills), Northern Plains (west river), Southern Plains (south-central SD) and Temperate Plains (east river).

Water Quality Indicators and Benchmarks

The suite of biological, chemical, physical habitat, and recreational (human health) indicators shown in Table 21 were chosen to assess the water quality of each aquatic resource group. These indicators were vetted and deemed to be the most representative of the water quality conditions encountered across the U.S including SD. The survey design allows the outcomes from using the indicators, which are derived from the randomly selected lake and stream sites, to be applied to the entire population.

Assessing conditions using the indicators shown in Table 21 requires a set of water quality benchmarks to compare against. For both surveys, two main methods were used to derive these benchmarks. The first used values reported in peer-reviewed scientific literature. Many resource agencies have already been using these well-established numbers for water quality assessment purposes including a human health fish tissue concentration for mercury at 300 parts per billion (ppb) and a microcystin toxin level of 8 µg/L. The second method uses an ecoregional specific data screening process to identify a set of least-impacted (reference) waterbodies. These lakes (NLA) and stream segments (NRSA) represent the best available water quality conditions exhibited in each ecoregion. A variety of criteria were used during the screening including water chemistry values and land use factors. A full discussion of this process can be found in the

technical support documents found on the NARS website (https://www.epa.gov/national-aquatic-resource-surveys).

Table 21: NARS Indicator Groups

Biological	Chemical	Physical	Recreational
Benthic macroinvertebrates	Acidification	Lakeshore habitat	Algal toxins (microcystin)
Chlorophyll *a*	Atrazine	Riparian vegetative cover	Cyanobacteria
Fish assemblage	Conductivity	Human disturbance	Enterococci
Fish tissue contaminants	Dissolved Oxygen	Physical habitat complexity	Fish tissue contaminants
Macrophytes	• Nitrogen	Shallow water/in-stream fish habitat	
Phytoplankton	Phosphorus	Streambed sediments	
Sediment diatoms	Salinity	Water clarity	
Zooplankton	Sediment enzymes		
	Sediment mercury		

Benchmarks were chosen from the range of values observed from all the reference sites in each ecoregion. An ecoregional reference data distribution was created for each indicator so percentiles could be calculated. The indicators from the remaining target waterbodies were compared to this reference site distribution. When an indicator from a target lake or stream site scored as good as the top 75% of the reference site distribution it was classified as "good." When an indicator scored lower than the bottom 5% of the reference site distribution the site was classified as "poor." Scores that fell between these two reference site distribution boundaries (>5%tile and <25%tile) were considered in "fair" condition. This classification process is a widely accepted approach and was used for scoring indicators from both the NLA and NRSA. Final reports from each survey provide a more detailed discussion on this approach including literature cited. Note that the described categories do not replace the assessments done by states/tribes on individual waterbodies relative to their specific water quality standards under the Clean Water Act. This process is designed to assess the lake and stream populations both nationally and ecoregionally.

State Estimates

Estimates for most of the water quality indicators were available for each state upon request from EPA statisticians. Enough waterbodies were selected from SD from both the NLA and NRSA (Table 20) so that each indicator could still be calculated within a 95% confidence interval and minimal change to the margin of error. The SD estimates detail the percentage of lakes and stream in SD that exceed the ecoregional benchmarks of concern or fall within the designated categories of "Good", "Fair" or "Poor" (described in the paragraph above) (EPA, 2012). The point estimates for indicators from both the NLA and NRSA are discussed in the following sections. All indicator estimates can be found in Appendix H and each is reported with a lower bound confidence limit (LCB95%) and an upper bound confidence limit (UCB95%). The confidence interval for each indicator means that, statistically speaking, SDDANR is 95% certain that the indicator derived from the SD lake or stream population falls within the boundaries given. All randomly selected lakes or streams for SD were compared to their respective ecoregional benchmarks.

NLA Key Findings from SD Lakes

Figures 2a-2f show NLA indicators derived from data sampled in 2012 and 2017. If data was available from both survey years, it was presented on one graph for comparison purposes. Epilimnetic oxygen, shown in Figure 2a, is a measure of the ability of a waterbody to support aquatic life. From 2012 over 85% of the lakes surveyed fell into the high (good) category (>5 PPM).

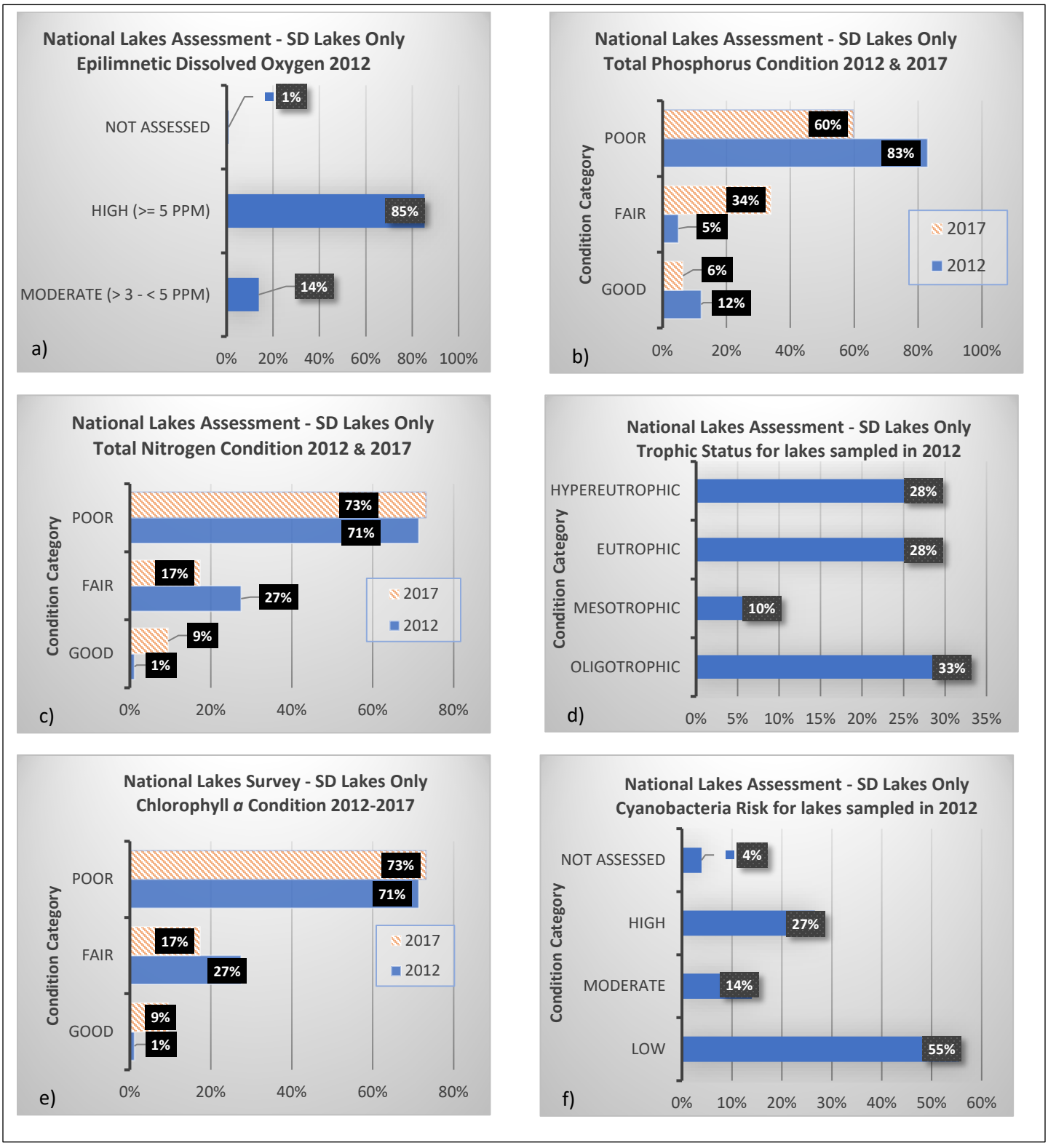

Figure 2: National Lakes Assessment Condition Estimates for SD Lakes

Figures 2b-2e present lake nutrient condition estimates and their resulting effects on water quality. The majority of lakes fall into the poor category for both 2012 and 2017 when compared to their ecoregional benchmarks (reference lakes). The final graph (Figure 2f) shows the risk level for cyanobacteria. Although a significant portion of the surveyed lakes rated very poorly with respect to nutrients, 55% of the population were reported to be at low risk for excessive blue green algae blooms during the 2012 survey year. Results for the NLA benthic macroinvertebrate, zooplankton, riparian, and littoral habitat indicators from the 2012 and 2017 surveys can be found in Appendix H.

NRSA Key Findings from SD Streams and Rivers

Figures 3a-3e show NRSA indicators derived from data collected during the 2013-2014 survey. Data was not yet available from the 2018-2019 survey for inclusion in this IR cycle. Similar to lakes, the rivers and streams survey points to excessive amounts of nitrogen and phosphorus with over 65% falling into the "Poor" category when compared to their ecoregional "reference" benchmarks (Figures 3a-3b).

Most SD river and stream miles exhibited concentrations for human health indicators below levels of concern. This included 73% of the population falling below the human health threshold for enterococci (1,280 cfu/100mL) and close to 100% of the rivers and stream miles reported swimming advisory levels for microcystin below the recommended level of $\leq$ 8 µg/L (Figure 3c and 3d).

As more survey data is processed and becomes available the results will be reported in subsequent IR cycles. Continued participation in future surveys will provide additional information such as trends and direction of change regarding all indicators show in Appendix H.

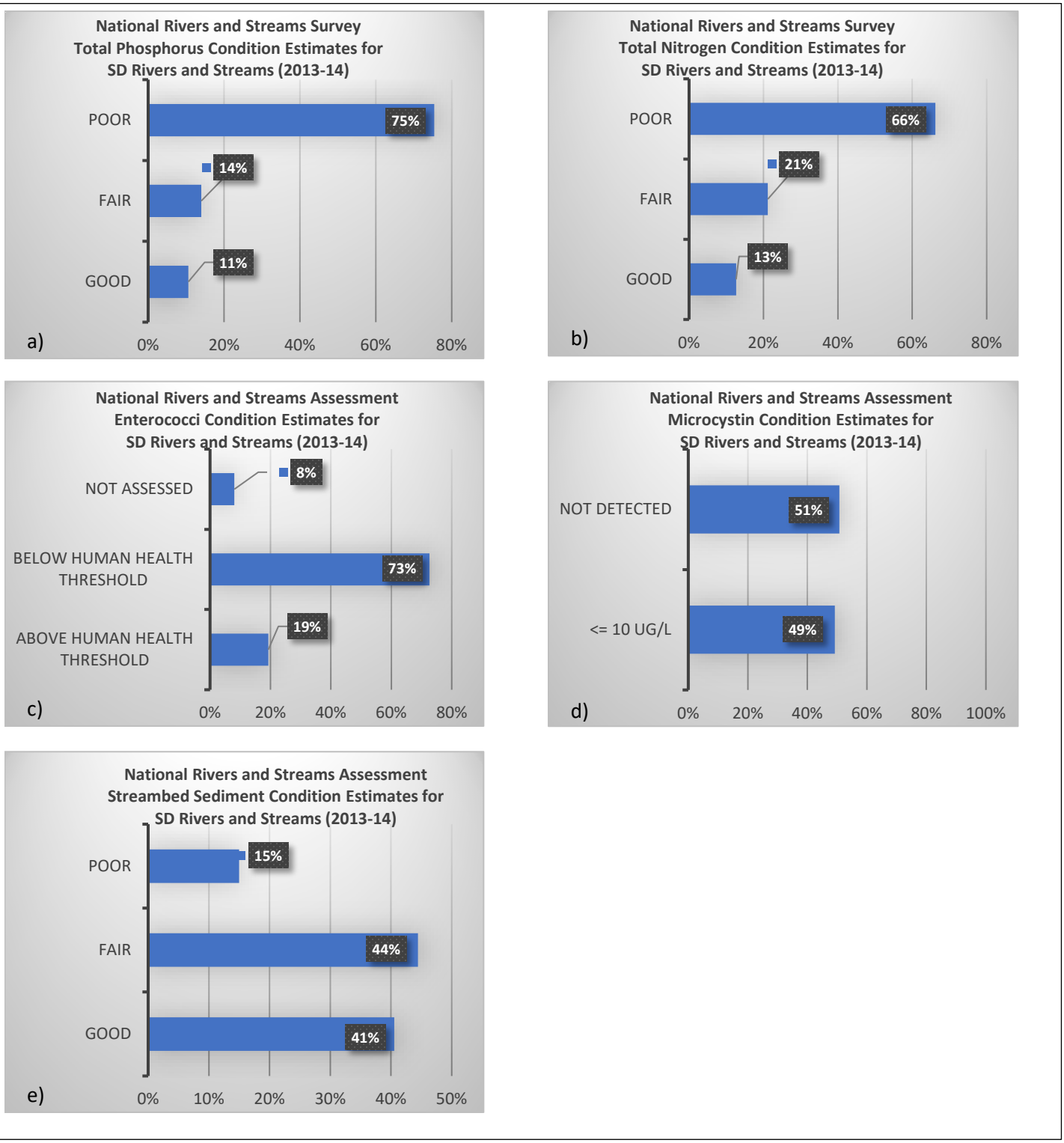

Figure 3: National Rivers and Streams Assessment Condition Estimates for SD Rivers and Streams

RIVER BASIN WATER QUALITY ASSESSMENTS

South Dakota has fourteen major river basins, most of which drain into the Missouri River (Figure 4). 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 5). More specific information is provided in the accompanying river basin tables in Appendix C.

The River Basin Tables (Appendix C) represent South Dakota's 305(b) Surface Water Quality Assessment. The table information contains the waterbody name, assessment unit identification, reach location, beneficial uses, support determinations, cause of nonsupport, parameters that meet criteria, and EPA category.

DANR does not sample all waterbodies for all possible contaminants. Some waterbodies may be nonsupporting for a particular parameter, and another waterbody may not have been sampled for that parameter. DANR has added a column to the basin tables that shows the parameters that meet criterion. If a parameter is not included in either the cause or meeting column, then the waterbody was not sampled for that parameter or has insufficient data for that parameter, and the status for that particular parameter is unknown. Sampled parameters for each reach have been entered into EPA's ATTAINS system and can be accessed at: https://www.epa.gov/waterdata/assessment-and-total-maximum-daily-load-tracking-and-implementation-system-attains.

Sources of impairment are not included in the basin tables. Sources of impairment are identified during watershed assessments and TMDL development. For more information on sources identified during TMDL development, please refer to the TMDL documents on the DANR website at: https://danr.sd.gov/Conservation/WatershedProtection/TMDL/default.aspx.

In 2008, DANR adopted the bacterial indicator *E. coli* into the Surface Water Quality Standards to protect recreation beneficial uses. *E. coli* is a fecal coliform bacterium and both indicators originate from common sources in relatively consistent proportions. In general, most of the assessment units previously identified as impaired for fecal coliform were also impaired for *E. coli*. DANR received EPA approval for many fecal coliform TMDLs over the past several years (Appendix A). DANR scientists developed a conversion factor using years of paired fecal coliform and *E. coli* data. Results of the analysis suggest nearly a 1:1 ratio. Because the two bacterial indicators were determined to be interrelated, fecal coliform TMDLs can be considered useful for implementing measures to correct *E. coli* impairment. DANR plans to work with EPA Region 8 on a process to convert fecal coliform TMDLs to *E. coli* TMDLs for several assessment units that have a fecal coliform TMDL and are currently on the 303(d) list for *E. coli.*

Basin waterbody support tables are located in Appendix C. Basin waterbody support maps are located in Appendix F.

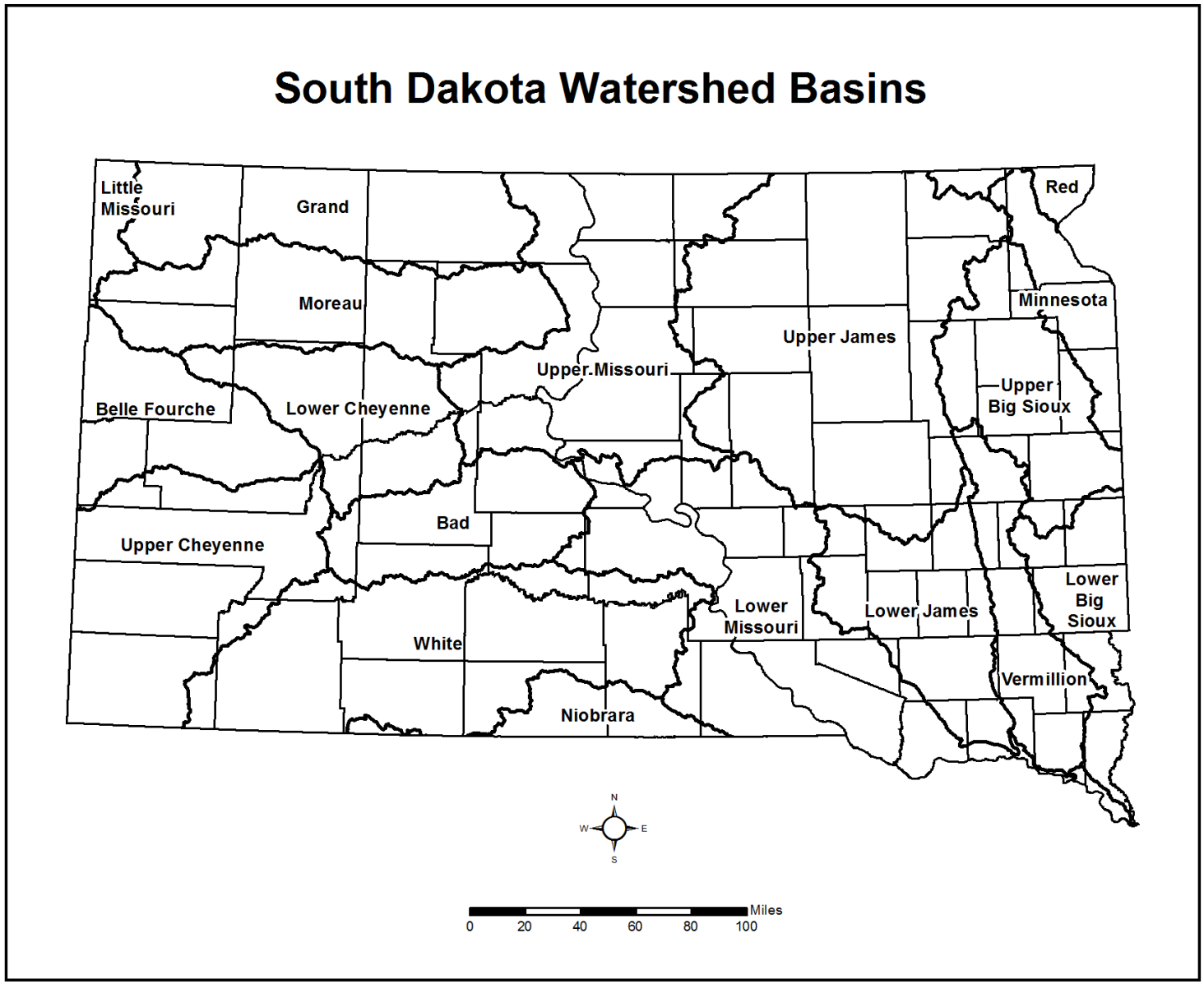

Figure 4: Major River Basins in South Dakota

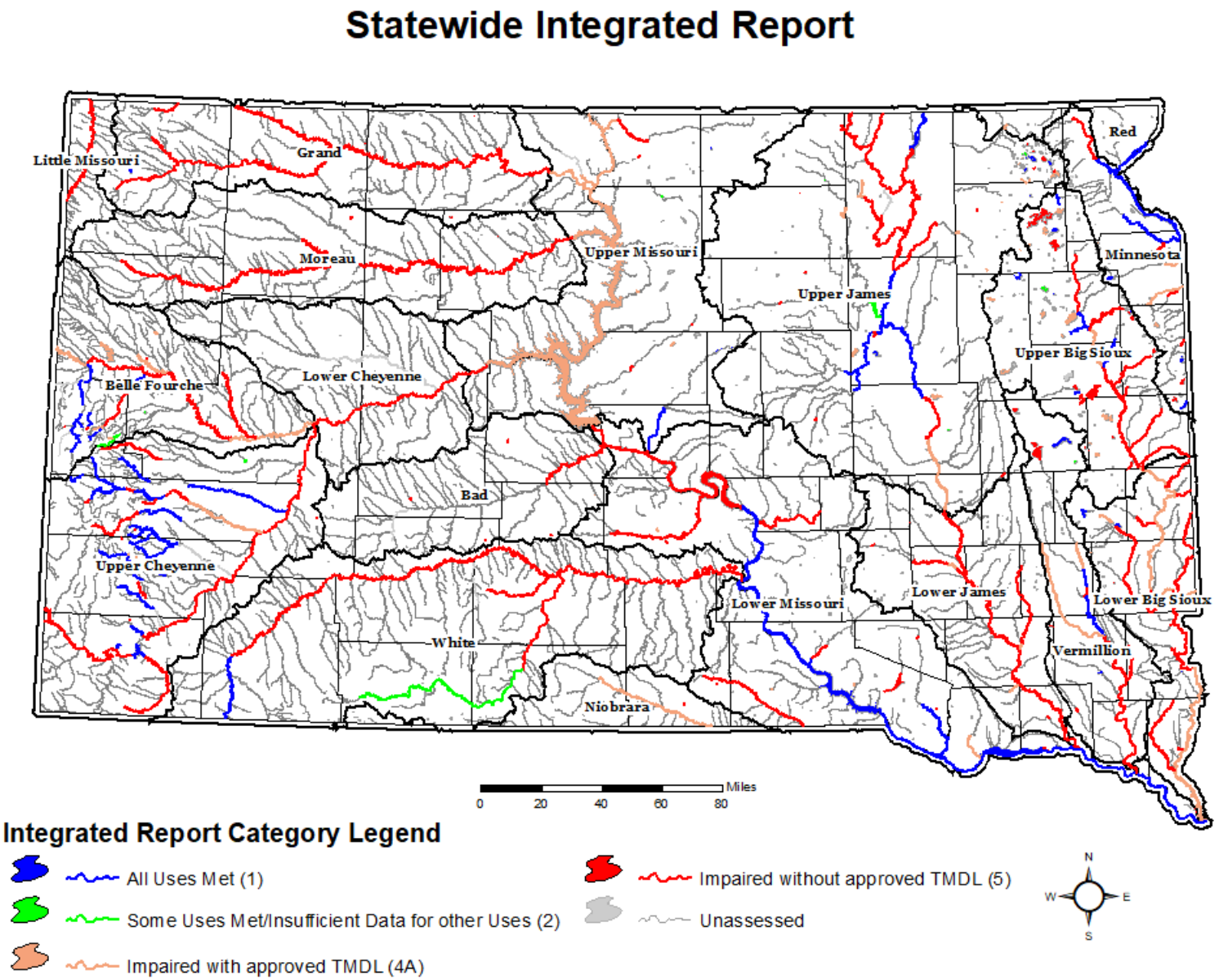

Figure 5: 2022 South Dakota Waterbody Status

Bad River Basin

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.

DANR has assessed five 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 the South Fork Bad River. However, the data are limited, and for most sites, the only parameters that were measured were specific conductance and water temperature.

There are no current watershed assessment or implementation projects ongoing in the Bad River Basin.

Belle Fourche River Basin

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 hardrock 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.

DANR has assessed six lakes and maintains 22 water quality monitoring sites on many streams within the Belle Fourche basin. Water quality monitoring sites are located on the Belle Fourche River, Spearfish Creek, Whitewood Creek, and various other streams. Most of the streams are routinely monitored for toxic pollutants, such as heavy metals, because several hardrock mining operations are or were previously located in this basin. Available data from DANR watershed assessment projects and sponsors were used to determine waterbody support.

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.

False Bottom Creek originates near historic tailings and current spent ore and waste rock facilities at Wharf Resources gold mine. Water quality samples collected near False Bottom Springs, the headwaters to False Bottom Creek, contain elevated selenium. This reach of False Bottom Creek is listed as not supporting some of its beneficial uses due to selenium.

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 HydroGeoLogic, Inc. 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.

Several 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 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. TMDLs are currently being developed for the impaired segments of Whitewood Creek.

An implementation project has been ongoing since 2004 to address water quality of the Belle Fourche River and tributaries. Implementation efforts have primarily focused on irrigation practices to reduce TSS. Recent emphasis is being placed on grazing management practices to reduce bacteria. The Belle Fourche River continues to remain nonsupporting for TSS; however, a TMDL was approved in 2005. Fecal coliform and *E. coli* TMDLs have been approved for two segments of the Belle Fourche River.

Big Sioux River Basin

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 economic activity is agriculture, but it also contains much 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.

DANR has assessed 45 lakes and maintains 26 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 DANR watershed assessment projects and project sponsors were used to determine waterbody support. The city of Sioux Falls, the Minnesota Pollution Control Agency, Friends of the Big Sioux River, and EDWDD also supplied data for waterbodies within the Big Sioux Basin. EDWDD field personnel assessed 42 stream segments twice per month (May to October) and 34 lakes monthly (May to September) in the Big Sioux, Red, and Minnesota River basins during the 2020 and 2021 field season. The monitoring project allowed for collection of data on almost all waterbodies within the Big Sioux, Red, and Minnesota River basins. The next rotation for this regional assessment will be in the Black Hills.

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 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.

The main causes of nonsupport within Big Sioux River basin streams continue to be *E. coli* and TSS. 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. Most of the monitored lakes are eutrophic or hypereutrophic. The moderate size and shallow depth of most lakes contribute 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 surface water and/or changes in areas inundated by water. 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 like other lakes in the basin. However, the methylation rate is typically higher and results in a greater bioavailability of mercury to aquatic life. Thirty-eight waterbodies in the Big Sioux Basin were monitored for mercury in fish tissue. This includes thirty-five lakes and three river/stream segments. Seventeen waterbodies support the mercury in fish tissue criterion, while twenty-one waterbodies do not support the criterion. A statewide mercury TMDL has been approved by EPA that identifies atmospheric deposition as the primary source of elemental mercury.

Watershed implementation projects within the basin are focused on reducing bacteria, sediment, and nutrient loads from both manmade and natural sources. Current implementation projects include the Upper Big Sioux River Implementation project and the Big Sioux River Watershed Implementation project which encompass a large portion of Big Sioux River watershed from the headwaters to the confluence with the Missouri River with the exception of the watershed area between Watertown and Estelline. Implementation efforts being conducted in the upper noncontributing portion of the basin fall under the Northeast Glacial Lakes Implementation project. Part of the focus of this project is to protect high quality lakes in the region.

Cheyenne River Basin

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.

DANR has assessed 18 lakes and maintains 39 water quality monitoring sites within the Cheyenne basin. Monitoring sites are located on the Cheyenne River, French Creek, and Rapid Creek. Other monitoring sites are located on various other streams in the basin. In addition, available data from DANR watershed assessment projects and sponsors were also used to determine waterbody support.

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

The USGS maintains water quality monitoring sites located in the Cheyenne River basin including: Battle Creek, Highland Creek, Rapid Creek, 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.

The Cheyenne River basin is home to deposits of natural uranium, historic uranium mining, and current exploration drilling. DANR maintains three water quality monitoring locations within the basin to monitor for uranium and other associated parameters. For this 2022 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. Most segments of the Cheyenne River are nonsupporting for *E. coli* bacteria and TSS. Segments below the Fall River have approved TMDLs for bacteria.

For reaches above Rapid City, Rapid Creek meets water quality standards for the designated beneficial uses. Reaches within and below Rapid City to the Cheyenne River continue to display poor water quality due to excessive *E. coli* bacteria levels.

Sediment removal was implemented at Horsethief Lake (SD-CH-L-HORSETHIEF_01), Lakota Lake (SD-CH-L-LAKOTA_01) and Bismark Lake (SD-CH-L-BISMARK_01) under direction of the U.S. Forest Service in the fall of 2014. The waterbodies were dewatered, and the lakebeds were allowed to dry prior to excavation. Sediment removal was completed by the summer of 2015 and the waterbodies were allowed to recharge. Through data analysis in the 2022 report, Lakota Lake is now full support, Horsethief Lake is nonsupport, and Bismark lake is still not assessed.

Twelve waterbodies (nine lakes and three river reaches) were assessed for mercury in fish tissue. Eight of those waterbodies met water quality standards for mercury in fish tissue while four waterbodies did not.

No assessment or implementation projects are currently ongoing in the Cheyenne River basin.

Grand River Basin

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. Agriculture is the major economic activity in the basin, but energy development is important in the region as well.

DANR has assessed six lakes and maintains eight 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.

Due to historic uranium mining in the Grand River basin, DANR 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 salinity/sodium adsorption ratios (SAR) are typical of the entire basin. The North Fork Grand River 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 Grand River drainage contains erosive soils, which contribute sediment and suspended solids that often produce high TSS and SAR levels in the South Fork Grand River.

Shadehill Reservoir and the Grand River are considered impaired for irrigation use due to elevated salinity/SAR. High sodium concentration, combined with the clay characteristics of most soils in this region, significantly reduce the acres suitable for continuous irrigation. This condition is measured by the SAR. A SAR value of 10 or greater indicates that the buildup of sodium could break down soil structure and cause serious problems for plant growth. Irrigation is still an existing use and occurs in this basin despite not meeting water quality criterion

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

Waters in the Grand River basin are affected by unique jurisdictional issues. DANR continues discussions with EPA to determine next steps regarding TMDL development and prioritization. Therefore, TMDL priority has been listed as “low” in the Appendix D.

James River Basin

The James River basin is the 2nd most populated 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. The James River basin is the second most populated basin in the state.

DANR has assessed 52 lakes and maintains 25 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 DANR watershed assessment projects and sponsors were used to determine waterbody support.

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, Foot Creek, and several unnamed tributaries in the basin. However, the data are very limited. At most sites, the only parameters that were measured were specific conductance and water temperature.

Dissolved oxygen and *E. coli* were the main impairments observed within the James River basin during this reporting cycle. Past reporting cycles have also identified the same causes of impairment within the James River basin. Substantial organic loading from nonpoint sources throughout the watershed occurs during run-off events. Decaying organic material reduces dissolved oxygen concentration of flood water inundating the flood plain. As water drains back into the river channel, the oxygen is greatly reduced. Agricultural activities such as livestock operations, grazing in riparian zones, lack of riparian vegetation, and row crop production heavily contribute to suspended sediments and bacteria in the James River basin.

Mercury in fish tissue affects many waterbodies in the James River basin. While there are many factors that influence mercury accumulation in fish, a significant factor in this basin is the expansion of surface water and/or change in area inundated by water. 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 to aquatic life. Thirty-nine waterbodies in the James River Basin were monitored for mercury in fish tissue. Eleven waterbodies met the criterion, while twenty-eight waterbodies did not. A statewide mercury TMDL has been approved by EPA that identifies atmospheric deposition as the primary source of elemental mercury.

A National Water Quality Monitoring Initiative Partnership project sponsored by NRCS is being conducted on three 12-digit hydrologic unit watersheds of Firesteel Creek. The focus area is the West Branch (101600110804), main stem (101600110906) and Storia (101600110905) watersheds. DANR and partners conducted baseline water quality monitoring at several site locations on Firesteel Creek prior to the initiation of the National Water Quality Monitoring Initiative project. Monitoring efforts are currently being conducted to increase baseline data and monitor effectiveness of best management practices as part of the South-Central Water Quality Monitoring project sponsored by the James River Development District.

The South-Central Watershed Implementation Project is also ongoing in the James River Basin. This project encompasses the Lower James River watershed south of Huron to the Missouri River, including Lake Mitchell and Firesteel Creek. In addition, the Lewis and Clark Reservoir Watershed (Missouri River basin), the Vermillion River basin, and Niobrara River basin are also included in the project area. Grassland and cropland BMPs, grassland management systems, riparian area management, and animal waste systems are the main BMPs used to combat excess nutrients, bacteria, and sediment in waterbodies within the project area. Extensive water quality monitoring is also a component of the project designed to monitor effectiveness of best management practices. Funding for the project is provided by NRCS, DANR, and the James River Development District.

Little Missouri River Basin

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.

DANR has one water quality monitoring station in the Little Missouri River basin located on the Little Missouri River. There are currently no formal watershed assessment or implementation projects in the basin.

Minnesota River Basin

The Minnesota River basin is located 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.

DANR has assessed eleven lakes and maintains ten water quality monitoring sites within the Minnesota basin. EDWDD also submitted data for waterbodies with the Minnesota River basin. Most stream impairments are due to bacteria, while lake impairments were due to mercury in fish tissue and temperature.

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 within the Northeast Glacial Lakes project that also encompasses Day and Marshall Counties. Grazing management, riparian buffers, and livestock stream crossings are some of the best management practices used to improve water quality.

Missouri River Basin

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.

DANR has assessed twenty-seven lakes and maintains thirteen 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 2018 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 and USACE.

Lake Sharpe is listed in the Missouri River basin tables as nonsupporting for the (2) coldwater permanent fish life propagation beneficial use due to the temperature criterion. USACE profile data summaries and DANR 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 and by late summer, coldwater habitat is limited to coldwater discharges from Oahe Dam. Profile data collected by DANR 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. DANR is currently working with EPA on a Use Attainability Analysis to justify changing the (2) Coldwater permanent fish life propagation use to a (4) Warmwater permanent fish life propagation use.

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 through September 2018, indicate the temperature criterion was met longitudinally during most months throughout most the length of the reservoir within the state boundary. Thermal profile contour plots measured in August 2018 indicate the temperature criterion was met longitudinally from Oahe Dam to near river mile 1200 (Indian Creek). During this time, pool elevation was high and ranged from 1614 to 1618 feet mean sea level (ft-msl). At the time this 2022 Integrated Report was written, the USACE 2018 report was the most recent report available.

Eighteen waterbodies, including the four mainstem Missouri River reservoirs were assessed for mercury in fish tissue. Eleven waterbodies met the water quality criterion for mercury in fish tissue while seven did not.

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.

Moreau River Basin

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.

DANR has assessed two lakes and maintains five water quality monitoring sites within this basin. Three monitoring sites are located on the Moreau River, one is located on the South Fork Moreau, and a new site was established on Rabbit Creek (2018).

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.

Much of the sediment in the Moreau River basin 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, salinity/SAR, and specific conductance due to natural conditions, and *E. coli* bacteria from livestock and wildlife contributions.

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 Moreau River was based on all measured parameters including those associated with uranium mining. There were no exceedances for any parameters associated with uranium mining. As in previous reporting cycles, the Moreau River is listed as not

supporting some beneficial use designations based on exceedances of TSS, *E. coli*, and salinity/SAR.

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

Waters in the Moreau River basin are affected by unique jurisdictional issues. DANR continues discussions with EPA to determine next steps regarding TMDL development and prioritization. Therefore, TMDL priority has been listed as “low” in the Appendix D.

Niobrara River Basin

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.

DANR has assessed two lakes and maintains one water quality monitoring site on the Keya Paha River.

The Keya Paha River originates at the confluence with Antelope Creek in the Rosebud Indian Reservation. The river flows in a south-east direction and exits the state east of Wewela, South Dakota. The river is not supporting its designated uses due to TSS 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.

Implementation efforts are being conducted through the South-Central Watershed Project.

Red River Basin

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.

DANR has assessed two lakes and does not maintain any water quality monitoring sites in the Red River basin.

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

Vermillion River Basin

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.

DANR has assessed eight lakes and maintains seven water quality monitoring sites within this basin. Three sites are located on the Vermillion River, two are located on the East Fork Vermillion River, and one on Long Creek.

The USGS has water quality monitoring sites in the basin including sites on 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 Vermillion River is nonsupporting due to exceedances of *E. coli* and 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.

Implementation efforts are being conducted through the South-Central Watershed Project.

White River Basin

The White River basin is the southernmost of the five major west-river drainages in South Dakota. 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.

DANR has assessed one lake in the White River basin and maintains eight water quality monitoring sites within this basin. Four monitoring sites are located on the White River 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, and others. The data are limited, and the only parameters that were measured were specific conductance and water temperature.

DANR 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 occur in the Badlands and throughout the entire length of the basin. Site specific water quality standards for TSS were established by DANR in 2009 for the White River and Little White River. Portions of the White River are listed as impaired for *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.

WETLANDS

Wetland resources across the Prairie Pothole Region (PPR) of eastern South Dakota provide many ecological services (Figure 6). 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 provides valuable documentation regarding identity, extent, characteristics, and distribution of wetland resources in the PPR.

Figure 6: Map Depicting Prairie Pothole Region

The PPR of eastern South Dakota had an estimated 1,780,859 acres of wetlands with shallow water habitat in the early to middle 1990's (Johnson and Higgins, 1997). By 2009, South Dakota had an estimated 1,870,790 acres of shallow water wetlands (Dahl, 2014). The total number of wetlands in South Dakota declined by 2.8% from 1997 to 2009 (Dahl, 2014). Small temporary wetlands comprised the primary type of emergent wetland loss. South Dakota did exhibit gains in all other emergent wetland classes especially larger seasonal and semipermanent classes between 1997 and 2009. This implies that the overall wetland area in South Dakota increased from the early to middle 1990s to 2009, which is consistent with the wetland area estimates provided by Johnson and Higgins (1997) and Dahl (2014). The wetland acreage estimates provided by Dahl (2014) represent the most recent documentation of wetland extent available for South Dakota.

The general loss of small temporary wetlands and gain in larger seasonal and semipermanent wetlands can be attributed to agricultural drainage practices. Portions of eastern South Dakota lack open channel ditch networks to convey water from wetland depressions in agricultural fields to riverine systems. Drainage from small temporary wetlands is often conveyed by drain tile networks to downstream basins contributing to the increase in seasonal or semipermanent wetland habitats. The general loss of temporary wetlands and overall increase in acreage of seasonal and semi-permanent is likely the present trend.

> ***ARSD 74:51:01:01(53):*** *"Wetlands," 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 including swamps, marshes, bogs, and similar areas.

Wetlands are designated the beneficial use of fish and wildlife propagation, recreation and stock watering waters, which provides protection under existing narrative and numeric water quality standards and are specifically protected as waters of the state under ARSD 74:51:01:11.

The USACE is responsible for the control of activities that place fill in wetlands. The USACE authority stems from Section 404 of the CWA. 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 issuing a 404 permit, the USACE issues a public notice, taking into consideration the comments of the EPA, GF&P, DANR, other resource agencies, and the general public. Construction projects involving wetlands must receive certification from DANR under Section 401 of the CWA to certify the action will not violate South Dakota Surface Water Quality Standards. DANR regulates the discharge of pollutants from point sources 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 USFWS Waterfowl Production Areas covering about 183,000 acres of uplands and wetlands were purchased by South Dakota prior to 1994 (Johnson and Higgins 1997). The USFWS also obtained easements on an estimated 613,000 acres of eastern South Dakota wetlands. 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.

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 Natural Resource Management Department at SDSU, 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 IPCI development in South Dakota, researchers noted that the ecological health of eastern South Dakota prairie pothole wetlands decreases 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 wetlands or wet pockets in fields to increase tillable acres. Producers enrolled in United States Department of Agriculture programs are required to gain approval before engaging in wetland drainage practices. The NRCS conducts criteria-based wetland determinations to determine a wetland's eligibility for drainage. Wetland drainage is most prevalent in eastern 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 CWA jurisdiction or any other federal protection. The South Dakota Legislature has granted counties and townships the authority to manage drainage issues at the local level.

PUBLIC HEALTH/AQUATIC LIFE CONCERNS

The cost of routinely monitoring most toxic pollutants is prohibitive. At present, priority toxins (CWA 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 DANR ambient monitoring network and the statewide lake assessment project. Miles or acres affected by toxins are below in Table 22.

Table 22: Total Acres and Miles Affected by Toxics

Waterbody	Acres and Miles Monitored For Toxics*	Acres and Miles with Elevated Levels of Toxics**
Rivers (miles)	6,206	2.3
Lakes (acres)	110,902	50

* EPA's list of Priority Pollutants based on CWA 307(a)

** 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 25 separate aquatic life concern incidents investigated from October 1, 2019, through September 30, 2021. Most of these kills occurred due to oxygen depletion during winter months (winter kill) or water high temperatures and oxygen depletion often attributed to algae bloom and decay (summer kill). None of the kills resulted from any type of point source discharge or known spill.

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, there were eight minor fish kills, eight moderate fish kills, and nine major fish kills during this reporting cycle 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, DANR and/or GF&P are 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.

DANR 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. DANR 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 2022 Integrated Report cycle, there were no waterbodies listed as impaired due to fish kills (Table 23).

Table 23: Summary of Fish Kill Investigations

State of South Dakota
Fish Kills

(Oct. 2019 - Sept. 2021)

Date Reported	Waterbody	County	Severity	Cause
02-25-2020	Putney Slough	Brown	Minor	Winter Kill
03-27-2020	Mud	Turner	Major	Winter Kill
04-27-2020	Swan Lake	Turner	Minor	Spring Kill
05-30-2020	Hwy 81 West	Kingsbury	Moderate	Spring Kill
07-07-2020	Burbank Lake	Union	Minor	Summer Kill
07-12-2020	Madison	Lake	Moderate	Summer Kill
08-21-2020	Ravine Park	Beadle	Major	Summer Kill
08-28-2020	Tennyson Dam	Pennington	Moderate	Summer Kill
08-31-2020	Scheffel WPA	Bon Homme	Major	Summer Kill
09-01-2020	Miller Pond FMA	Hanson	Major	Summer Kill
09-03-2020	Worthing Community Fishing Pond	Lincoln	Minor	Summer Kill
09-08-2020	Tripp	Hutchinson	Minor	Summer Kill
03-08-2021	Curlew	Meade	Major	Winter Kill
03-08-2021	Covell Lake	Minnehaha	Minor	Winter Kill
03-20-2021	Gardener	Harding	Moderate	Winter Kill
06-08-2021	Macke	McCook	Major	Summer Kill
06-10-2021	Unnamed Pond	Roberts	Moderate	Summer Kill
06-10-2021	Roosevelt	Pennington	Minor	Summer Kill
07-26-2021	Unnamed Pond	Lake	Major	Summer Kill
07-27-2021	Menno	Hutchinson	Moderate	Summer Kill
07-28-2021	Fate	Lyman	Moderate	Summer Kill
08-01-2021	Herman Pond	Lake	Major	Summer Kill
08-02-2021	Ravine Park	Beadle	Minor	Summer Kill
08-21-2021	Oahe (Entire)	Dewey	Major	Summer Kill
08-31-2021	Marindahl	Yankton	Moderate	Summer Kill

Unsafe Beaches

Bacteria data collection and decisions related to public swimming beach closures are the responsibility of the individual management agency. DANR solicits water quality information including beach closure information from federal, state and local natural resource agencies during the department's request for data process. DANR lists a waterbody as impaired if three beach closures per season occur in a consecutive three-week sampling period. For the 2022 reporting period, DANR was given the last 10 years of beach data from GF&P. A beach closure occurred at Alvin Lake during the 2020 field season (547.5 *E. Coli* /100 ml MPN).

Fish Flesh Contaminants

The Surface Water Quality Program, in partnership with the South Dakota Department of Game, Fish, and Parks, and the South Dakota Department of Health, sample and analyze fish from a variety of waterbodies. DANR 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. Waterbodies are selected for monitoring based on GF&P fishery management objectives, public access, and fishing pressure. Subsequently, this data is also used to assess support of the surface water quality criterion of mercury in fish tissue. A list of waterbodies sampled for fish flesh contaminants is available at: https://danr.sd.gov/OfficeOfWater/SurfaceWaterQuality/waterqualitystandards/fishflesh.aspx. Not all waterbodies in this report have been assessed for mercury in fish tissue.

The Food and Drug Administration (FDA) has set 1.0 mg/kg total mercury as the action level for commercial fish. In South Dakota, the Department of Health is responsible for issuing fish consumption advisories and under the guidance of the FDA, uses the FDA action level. For a list of South Dakota waterbodies with fish consumption advisories refer to the Department of Health website at http://doh.sd.gov/food/fish-advisories.aspx. DANR also assesses mercury in fish tissue but with the purpose of determining if the waterbody is supporting its beneficial uses.

Because fish consumption advisories are issued on waterbodies that exceed 1.0 mg/kg mercury in fish tissue (FDA criterion) and the DANR assesses waterbody support using the surface water quality criterion of 0.3 mg/kg mercury in fish tissue, there are waterbodies in this Integrated Report that are not meeting their designated uses due to mercury in fish tissue based on a water quality standard but may not have a fish consumption advisory. Although mercury in fish tissue is the common factor, public advice on fish consumption and waterbody beneficial use support are separate issues that are addressed by different state agencies. While DANR makes the determination if a waterbody is not meeting its beneficial uses due to mercury in fish tissue, the South Dakota Department of Health provides public health advice. Waterbodies with fish consumption advisories and/or waterbodies that exceed the surface water quality criterion are considered nonsupporting.

Mercury fish tissue concentration is a complex issue. There are many factors that affect a waterbody support determination for mercury in fish tissue, such as the species and feeding guild of fish collected, the age of fish collected, waterbody geomorphology, and subsequent methylation rates, and others.

Domestic Water Supply Restrictions

There are currently no water consumption restrictions on waterbodies with the domestic water supply beneficial use designation. However, Firesteel Creek, a segment on the James River and the Big Sioux River, Maple River, Elm River, Lake Mitchell, Lake Waggoner, and Durkee Lake are listed as not supporting the domestic water supply beneficial use. Firesteel Creek and Lake Mitchell are only used as an emergency backup for the City of Mitchell. Lake Waggoner and Durkee Lake are no longer being used as drinking water sources; the beneficial uses of both waterbodies will be reviewed and possibly reclassified in the future. However, the segments listed below for the Big Sioux, Elm, James, and Maple Rivers are currently being used as a source water for public water supplies. Tables 24 and 25 contain information on reach descriptions and pollutant causes.

Table 24: 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 25: Summary of Waterbodies Not Fully Supporting Domestic Water Supply Use

AU ID	Waterbodies	Location	Characterization	Cause
Rivers and Streams				
SD-BS-R-BIG_SIOUX_10	Big Sioux River	I-90 to diversion return	Not Supporting	Total Dissolved Solids (TDS)
SD-JA-R-ELM_01	Elm River	Elm Lake to mouth	Not Supporting	Total Dissolved Solids (TDS)
SD-JA-R-FIRESTEEL_01	Firesteel Creek	West Fork Firesteel Creek to mouth	Not Supporting	Total Dissolved Solids (TDS)
SD-JA-R-JAMES_07	James River	James River Diversion Dam to Huron 3rd Street Dam	Not Supporting	Total Dissolved Solids (TDS)
SD-JA-R-MAPLE_01	Maple River	ND border to Elm River	Not Supporting	Total Dissolved Solids (TDS)
Lakes and Reservoirs				
SD-BA-L-WAGGONER_01	Waggoner Lake	Haakon County	Not Supporting	Chlorophyll-a
SD-CH-L-DURKEE_01	Durkee Lake	Meade County	Not Supporting	pH
SD-JA-L-MITCHELL_01	Lake Mitchell	Davison County	Not Supporting	Chlorophyll-a

IV. POLLUTION CONTROL PROGRAMS

POINT SOURCE POLLUTION CONTROL PROGRAM

The state received delegation of the federal 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, 2021, the state has issued a total of 230 individual SWD permits in South Dakota. In addition, DANR has issued coverage to 2,165 facilities under General Storm Water permits, and 808 facilities under other General permits. DANR has also issued 23 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. Water quality-based limits are developed when technology-based limits alone are not adequate to protect the beneficial uses of the receiving stream. Therefore, water quality-based limits and toxicity testing requirements are also placed in many of the permits to ensure the surface water quality standards are met and maintained.

The state continues to require whole effluent toxicity testing for all major SWD permittees and certain significant minor SWD permittees. 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. This testing is supported by ARSD Section 74:51:01:12.

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.*

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

Many of South Dakota's streams eventually drain into higher-classified lakes. If a point source discharges into a tributary of a lake, DANR 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, DANR re-evaluates these discharges. If DANR determines that a discharge has a potential to impact a higher-classified lake, DANR has required the point source to cease its discharge to the lake. DANR 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 compliant, 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 FY2022 Intended Use Plan can be accessed at:

https://danr.sd.gov/Funding/docs/2022%20CW%20IUP%20final.pdf

Between October 1, 2019, and September 30, 2021, the Department's Board of Water and Natural Resources awarded 52 CWSRF loans and two loan amendments totaling $146,979,800. Portions of eight of the awards were provided as additional subsidy in the form of principal forgiveness. The principal forgiveness totaled $9,165,000. 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 1.875% for loans with a term of 10 years or less, 2.0% for loans with a term greater than 10 years up to 20 years, and 2.125% 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 1.00% for up to 10 years, 1.25% for loans with a term greater than 10 years up to 20 years, and 1.375% for loans with a term greater than 20 years up to a maximum of 30 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, 2019, and September 30, 2021, the department awarded a total of $270,000 for 27 engineering studies. The Board awarded $1,694,000 for the construction of three wastewater improvement 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 provided approximately $10.0 million annually. Between October 1, 2019, and September 30, 2021, $19,174,750 in state grants and $792,000 in state loans were awarded to 18 wastewater collection or treatment and storm water projects.

COST/BENEFIT ASSESSMENT

DANR provides the Governor and Legislature with annual reports summarizing water and wastewater development activities for the preceding calendar year. These annual reports can be accessed at:

https://danr.sd.gov/Funding/EnviromentalFunding/default.aspx

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

Nonpoint source (NPS) pollution is the most serious and pervasive threat to the water quality of South Dakota's waters. Nonpoint source is defined as a source of water pollution that does not meet the legal definition of "point source" in section 502(14) of the Clean Water Act.

> *'The term point source means any discernible, confined and discrete conveyance, including but not limited to any pipe, ditch, channel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture'.-* Section 502(14) of the Clean Water Act.

Sources of nonpoint source pollution are diverse. Examples include fertilizer, herbicide and topsoil runoff from agricultural fields, livestock waste deposited in or near streams from unfenced livestock, sediment runoff from overgrazed pastures, manure applied to frozen fields, pet waste in urban areas, sediment from construction sites, sediment from improper logging techniques, leaking contents from failing septic tanks, drainage of acids or metals from abandoned mines and improperly applied chemicals and fertilizers in agricultural and urban environments. More information on nonpoint source pollution can be found here:
https://www.epa.gov/nps/basic-information-about-nonpoint-source-nps-pollution

While substantial progress has been made toward reducing pollution from point sources such as wastewater and industrial plants after the passage and implementation of the Clean Water Act, nonpoint source pollution remains an entrenched problem. NPS pollution is unregulated as agricultural activities are exempt from most of the provisions of the Clean Water Act. The technical and financial assistance currently available is not sufficient to solve all NPS pollution issues in the state. Landowners need to understand the nonpoint source issues and how their activities contribute to NPS pollution. Educating the public about NPS pollution issues may prompt landowners to voluntarily implement activities that control NPS pollution. The continuation of existing activities coupled with the addition of innovative new programs may reduce nonpoint source pollution in South Dakota.

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 BMPs and holistic resource management plans. 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. A copy of the current management plan is available here and detail on NPS-reducing best management practices is found here:

https://danr.sd.gov/Conservation/WatershedProtection/docs/NPSMgmtPlan19.pdf

South Dakota Nonpoint Source Projects

While the size, target audience, and structure of projects may vary, all share common elements of increasing awareness of NPS pollution issues. Each project identifies, quantifies, and locates sources of nonpoint source impairment, and reduces or prevents the delivery of NPS pollutants to waters of the state with emphasis on meeting targets established through TMDLs. Historically, the majority of the projects 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 TMDLs for impaired waterbodies.

Assessment/development projects generally range from one to three years and are designed to assess the water quality and beneficial uses of waterbodies in a predetermined area. The information attained through the assessment project will be used to identify sources of water quality impairments and will lead to the establishment of pollution reduction goals or TMDL endpoints.

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 Watershed Protection Program has 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 implementation projects are the most comprehensive type of project implemented through the South Dakota NPS Program. Watershed implementation projects are typically long term, three to five years, in duration and designed to implement TMDLs that address NPS pollution sources and beneficial use impairments identified during the completion of an assessment project. Watershed implementation projects promote and encourage the use of voluntary BMPs that help prevent or reduce NPS pollution being delivered to impaired waterbodies.

For information about specific South Dakota NPS projects funded using CWA Section 319 funds, contact DANR, or access EPA's Nonpoint Source Grants Reporting and Tracking System database. The following web link depicts watersheds where NPS assessment and implementation projects have been conducted:

https://danr.sd.gov/Conservation/WatershedProtection/Section319/Projects.aspx

Nonpoint Source Pollution Control Program Funding Strategy

DANR receives approximately $2.7 million in Section 319 funds annually from EPA. Administrative costs total about $842,000. The remaining $1.9 million is made available for project awards. DANR 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 include department fee funds, 604(b) funds, 106 funds, 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 DANR'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. Department of Agriculture's Environmental Quality Incentive Program, Conservation Stewardship Program, Agricultural Conservation Easement Program, Regional Conservation Partnership Program, and Conservation Reserve Programs.

V. PUBLIC PARTICIPATION PROCESS

To fulfill the requirements of the CWA and involve the affected community and stakeholders in the water quality improvement process, a public participation process for the Integrated Report has been implemented. Summarized below are the procedures employed by DANR to involve the public and affected parties in the development of this report.

Process Description

First Public Review/Input Period
An ad is published in the ten largest statewide newspapers and a public notice is placed on our One-Stop Public Notice page, announcing DANR 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 DANR 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 mailed out to "interested parties" and again published in the ten largest newspapers. The draft report is also made available on DANR's One-Stop Public Notice page at: https://danr.sd.gov/public/default.aspx. At this time, the draft report is also provided to EPA Region 8 for review and comment.

Personnel from DANR 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 will be included in Appendix I.

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VII. KEY TO ABBREVIATIONS

ATTAINS – EPA's Assessment Database (used for Integrated Report development)
ARSD – Administrative Rules of South Dakota
AUID – Assessment Unit Identifier
BMP – best management practice
cfu/100mL – colony forming units per 100 milliliters
CWA- Clean Water Act
CWSRF – Clean Water State Revolving Fund
DANR – South Dakota Department of Agriculture and Natural Resources
DO – dissolved oxygen
EDWDD – East Dakota Water Development District
EPA – Environmental Protection Agency
E. coli -*Escherichia coli*
FDA – Food and Drug Administration
GF&P – South Dakota Department of Game, Fish and Parks
HAB – Harmful Algal Bloom
HCI – Habitat Condition Index
IBI - Index of Biotic Integrity
IPCI – Index of Plant Community Integrity
IQR – interquartile range
IR – Integrated Report
mg/kg – milligrams per kilogram
mg/L – milligrams per liter
NARS- National Aquatic Resource Survey
NLA - National Lake Assessment
NGP - Northern Glaciated Plains
NPDES – National Pollutant Discharge Elimination System
PPR-Prairie Pothole Region
NPS – Nonpoint Source
NRCS – Natural Resources Conservation Service
NRSA – National Rivers and Streams Assessment
QA/QC – quality assurance/quality control
SAR – Sodium adsorption ratio
SDSU – South Dakota State University
SWD – Surface Water Discharge
SWLA – Statewide Lakes Assessments
SRAM – seasonal riparian area management
TMDL – Total Maximum Daily Load
TN – Total Nitrogen
TP – Total Phosphorus
TSI – Carlson's (1977) Trophic State Indices
TSS – total suspended solids
USACE – United States Army Corp of Engineers
USGS – United States Geological Survey
WET - Whole Effluent Toxicity
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	Hayes Lake	SD-BA-L-HAYES_01	Stanley County	Mercury in Fish Tissue	3/1/2016	65381
Bad	Murdo Dam	SD-BA-L-MURDO_01	Jones County	Mercury in Fish Tissue	3/1/2016	65382
Bad	Sheriff Dam	SD-BA-L-SHERIFF_01	Jones County (FPNG)	Mercury in Fish Tissue	8/18/2016	65867
Bad	Bad River	SD-BA-R-BAD_01	Stanley County line to mouth	TSS	2/7/2001	1537
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	Newell Lake	SD-BF-L-NEWELL_01	Butte County	Mercury in Fish Tissue	3/1/2016	64500
Belle Fourche	Orman Dam (Belle Fourche Reservoir)	SD-BF-L-ORMAN_01	Butte County	Mercury in Fish Tissue	3/1/2016	65384
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	SD-BF-R-BELLE_FOURCHE_01	Wyoming to Redwater River	*E. coli*	8/31/2017	68243
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

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Belle Fourche	Belle Fourche River	SD-BF-R-BELLE_FOURCHE_05	Alkali Creek to mouth	TSS	2/2/2005	11387
Belle Fourche	Deadwood Creek	SD-BF-R-DEADWOOD_01	Rutabaga Gulch to Whitewood Creek	*E. coli*	09/29/2020	R8-SD-2020-03
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	41058/41059
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/IA border to Nine Mile Creek	Fecal coliform	1/23/2008	34093
Big Sioux	Lake Albert	SD-BS-L-ALBERT_01	Kingsbury County	Mercury in Fish Tissue	3/1/2016	65387
Big Sioux	Lake Alvin	SD-BS-L-ALVIN_01	Lincoln County	TSI/fecal coliform	11/9/2001	2193/ 2194
Big Sioux	Antelope Lake	SD-BS-L-ANTELOPE_01	Day County	Mercury in Fish Tissue	3/1/2016	65388
Big Sioux	Bitter Lake	SD-BS-L-BITTER_01	Day County	Mercury in Fish Tissue	3/1/2016	64501
Big Sioux	Blue Dog Lake	SD-BS-L-BLUE_DOG_01	Day County	TSI/fecal coliform	2/7/2001	1436
Big Sioux	Brant Lake	SD-BS-L-BRANT_01	Lake County	TSI	4/12/1999	169
Big Sioux	Brush Lake	SD-BS-L-BRUSH_01	Brookings County	Mercury in Fish Tissue	3/1/2016	65389
Big Sioux	Clear Lake	SD-BS-L-CLEAR_01	Deuel County	TSI/Sediment	2/7/2001	1467
Big Sioux	Clear Lake (Hamlin)	SD-BS-L-CLEAR_H_01	Hamlin County	Mercury in Fish Tissue	3/1/2016	65390

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Big Sioux	Diamond Lake	SD-BS-L-DIAMOND_01	Minnehaha County	Mercury in Fish Tissue	3/1/2016	65391
Big Sioux	Dry Lake	SD-BS-L-DRY_01	Codington County	Mercury in Fish Tissue	3/1/2016	65396
Big Sioux	Dry Lake Number 2	SD-BS-L-DRY_NO2_01	Clark County	Mercury in Fish Tissue	3/1/2016	65392
Big Sioux	East Oakwood Lake	SD-BS-L-E_OAKWOOD_01	Brookings County	TSI/pH	6/13/2008	34521
Big Sioux	Enemy Swim Lake	SD-BS-L-ENEMY_SWIM_01	Day County	Mercury in Fish Tissue	3/1/2016	65397
Big Sioux	Goldsmith Lake	SD-BS-L-GOLDSMITH_01	Brookings County	Mercury in Fish Tissue	3/1/2016	65398
Big Sioux	Goose Lake	SD-BS-L-GOOSE_01	Codington County	Mercury in Fish Tissue	3/1/2016	65399
Big Sioux	Lake Herman	SD-BS-L-HERMAN_01	Lake County	TSI	9/29/2004	10978
Big Sioux	Lake Herman	SD-BS-L-HERMAN_01	Lake County	Mercury in Fish Tissue	3/1/2016	65400
Big Sioux	North Island Lake	SD-BS-L-ISLAND_N_01	Minnehaha/McCook counties (formerly SD-VM-L-ISLAND_N_01)	Mercury in Fish Tissue	3/1/2016	64502
Big Sioux	Lake Kampeska	SD-BS-L-KAMPESKA_01	Codington County	Nutrients/Sediment - special approval	12/26/1996	635
Big Sioux	Lake Kampeska	SD-BS-L-KAMPESKA_01	Codington County	Mercury in Fish Tissue	3/1/2016	65401
Big Sioux	Long Lake	SD-BS-L-LONG_COD_01	Codington County	Mercury in Fish Tissue	3/1/2016	64504
Big Sioux	Lake Madison	SD-BS-L-MADISON_01	Lake County	TSI/fish kill	4/12/1999	639
Big Sioux	Minnewasta Lake	SD-BS-L-MINNEWASTA_01	Day County	Mercury in Fish Tissue	3/1/2016	64506
Big Sioux	Pelican Lake	SD-BS-L-PELICAN_01	Codington County	Nutrients/Sediment-special approval	12/26/1996	918
Big Sioux	Lake Poinsett	SD-BS-L-POINSETT_01	Hamlin County	Nutrients-special approval	12/26/1996	2255

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Big Sioux	Lake Poinsett	SD-BS-L-POINSETT_01	Hamlin County	Mercury in Fish Tissue	3/1/2016	65402
Big Sioux	Reid Lake	SD-BS-L-REID_01	Clark County	Mercury in Fish Tissue	3/1/2016	64508
Big Sioux	Rush Lake	SD-BS-L-RUSH_01	Day County	Mercury in Fish Tissue	3/1/2016	65403
Big Sioux	School Lake	SD-BS-L-SCHOOL_01	Deuel County	TSI	9/2/2008	35132
Big Sioux	Lake Sinai	SD-BS-L-SINAI_01	Brookings County	Mercury in Fish Tissue	3/1/2016	65417
Big Sioux	Swan Lake	SD-BS-L-SWAN_01	Clark County	Mercury in Fish Tissue	3/1/2016	64509
Big Sioux	Twin Lakes/W. Hwy 81	SD-BS-L-TWIN_01	Kingsbury County	Mercury in Fish Tissue	3/1/2016	64510
Big Sioux	Twin Lakes	SD-BS-L-TWIN_02	Minnehaha County	Mercury in Fish Tissue	3/1/2016	64511
Big Sioux	West Oakwood Lake	SD-BS-L-W_OAKWOOD_01	Brookings County	TSI	6/13/2008	34522
Big Sioux	Waubay Lake	SD-BS-L-WAUBAY_01	Day County	Mercury in Fish Tissue	3/1/2016	65418
Big Sioux	Beaver Creek	SD-BS-R-BEAVER_01	Big Sioux River to S9, T98N, R49W	Fecal coliform	8/10/2011	41067
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_02	Split Rock Creek to SD-MN border	*E. coli*	11/07/2020	R8-SD-2021-01
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_01	S28, T121N, R52W to Lake Kampeska	*E. coli*	04/22/2020	R8-SD-2020-02
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

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_07	Brookings/Moody County Line to S2, T104N, R49W	Mercury in Fish Tissue	3/1/2016	65405
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_08	S2, T104N, R49W to I-90	*E. coli*/fecal coliform	9/26/2012 Updated-7/14/2019	42519 (old) R8-SD-2019-01
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_08	S2, T104N, R49W to I-90	TSS	12/6/2012 Updated-7/14/2019	53280 (old) R8-SD-2019-02
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_10	I-90 to diversion return	*E. coli*/fecal coliform	9/26/2012 Updated-7/14/2019	42520 (old) R8-SD-2019-01
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_10	I-90 to diversion return	TSS	12/6/2012 Updated-7/14/2019	53281 (old) R8-SD-2019-02
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_11	Diversion return to SF WWTF	*E. coli*/fecal coliform	9/26/2012 Updated-7/14/2019	42522 (old) R8-SD-2019-01
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_11	Diversion return to SF WWTF	TSS	12/6/2012 Updated-7/14/2019	53282 (old) R8-SD-2019-02
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_12	SF WWTF to above Brandon	*E. coli*/fecal coliform	9/26/2012 Updated-7/14/2019	42523 (old) R8-SD-2019-01
Big Sioux	Big Sioux River	SD-BS-R-BIG_SIOUX_12	SF WWTF to above Brandon	TSS	12/6/2012 Updated-7/14/2019	53283 (old) R8-SD-2019-02
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

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
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	2/01/2010	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	Brule Creek	SD-BS-R-BRULE_01	Big Sioux River to confluence with its east and west forks	*E. coli*	11/07/2020	R8-SD-2021-01
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
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 (SD/MN border to SD/MN border)	Fecal coliform	5/28/2008	34502
Big Sioux	Pipestone Creek	SD-BS-R-PIPESTONE_01	Split Rock Creek to MN border (SD/MN border to SD/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 (West Pipestone Creek to Big Sioux River)	TSS/fecal coliform	5/28/2008	34504

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
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	Union Creek	SD-BS-R-UNION_01	Big Sioux River to confluence with east and west forks	Fecal coliform	8/8/2011	41062
Big Sioux	Willow Creek	SD-BS-R-WILLOW_01	Big Sioux River to S7, T117N, R50W	Fecal coliform	6/4/2008	34507
Cheyenne	Center Lake	SD-CH-L-CENTER_01	Custer County	pH	8/08/2007	33707
Cheyenne	Center Lake	SD-CH-L-CENTER_01	Custer County	TSI	8/8/2007	33707
Cheyenne	Curlew Lake	SD-CH-L-CURLEW_01	Meade County	Mercury in Fish Tissue	3/1/2016	65406
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	9/02/2008	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
Cheyenne	Sheridan Lake	SD-CH-L-SHERIDAN_01	Pennington County	Mercury in Fish Tissue	8/18/2016	65871
Cheyenne	Stockade Lake	SD-CH-L-STOCKADE_01	Custer County	Mercury in Fish Tissue	8/18/2016	65870
Cheyenne	Sylvan Lake	SD-CH-L-SYLVAN_01	Custer County	TSI	9/1/2005	12351
Cheyenne	Sylvan Lake	SD-CH-L-SYLVAN_01	Custer County	pH (high)	8/18/2016	65861
Cheyenne	Battle Creek	SD-CH-R-BATTLE_01_USGS	Hwy 79 to mouth	*E. coli*fecal coliform	2/18/2014	56640
Cheyenne	Battle Creek	SD-CH-R-BATTLE_02	Teepee Gulch Creek to SD HWY 79	*E. coli*fecal coliform	2/18/2014	56641
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

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_03	Fall River to Cedar Creek	*E. coli*/fecal coliform	9/29/2010	39434/ 39429
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_04	Cedar Creek to Belle Fourche River	*E. coli*/fecal coliform	9/29/2010	39435/ 39430
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_05	Belle Fourche River to Bull Creek	*E. coli*/fecal coliform	9/29/2010	39436/ 39431
Cheyenne	Cheyenne River	SD-CH-R-CHEYENNE_06	Bull Creek to Lake Oahe	*E. coli* /fecal coliform	9/29/2010	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_04	S15, T1N, R8E to above Farmingdale	*E. coli*	11/07/2020	R8-SD-2021-01
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
Grand	Shadehill Reservoir	SD-GR-L-SHADEHILL_01	Perkins County	Mercury in Fish Tissue	3/1/2016	65407
James	Moccasin Creek		Aberdeen to Warner	Ammonia	3/19/2001	1581
James	Amsden Dam	SD-JA-L-AMSDEN_01	Day County	Mercury in Fish Tissue	3/1/2016	65408
James	Lake Byron	SD-JA-L-BYRON_01	Beadle County	Nutrients/Sediment-special approval	4/12/1999	618
James	Lake Carthage	SD-JA-L-CARTHAGE_01	Miner County	Mercury in Fish Tissue	3/1/2016	65409
James	Cattail Lake	SD-JA-L-CATTAIL_01	Marshall County (formerly SD-BS-L-CATTAIL_01)	Mercury in Fish Tissue	3/1/2016	65410

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
James	Lake Cavour	SD-JA-L-CAVOUR_01	Beadle County	Mercury in Fish Tissue	03/1/2016	65411
James	Clubhouse Lake	SD-JA-L-CLUBHOUSE_01	Marshall County	Mercury in Fish Tissue	8/18/2016	65868
James	Cottonwood Lake	SD-JA-L-COTTONWOOD_	Spink County	TSI	11/9/2001	2195
James	Cottonwood Lake	SD-JA-L-COTTONWOOD_01	Spink County	Mercury in Fish Tissue	3/1/2016	65413
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	Elm Lake	SD-JA-L-ELM_01	Brown County	Mercury in Fish Tissue	3/1/2016	64512
James	Lake Faulkton	SD-JA-L-FAULKTON_01	Faulk County	TSI/Sediment	4/12/1999	623
James	Lake Faulkton	SD-JA-L-FAULKTON_01	Faulk County	Mercury in Fish Tissue	3/1/2016	65414
James	Lake Hanson	SD-JA-L-HANSON_01	Hanson County	TSI	6/3/2004	10623
James	Lake Hanson	SD-JA-L-HANSON_01	Hanson County	Mercury in Fish Tissue	3/1/2016	65415
James	Hazeldon Lake	SD-JA-L-HAZELDON_01	Day County	Mercury in Fish Tissue	3/1/2016	65420
James	Henry Reservoir	SD-JA-L-HENRY_01	Near Scotland, SD	Mercury in Fish Tissue	3/1/2016	65419
James	Horseshoe Lake	SD-JA-L-HORSESHOE_01	Marshall County	Mercury in Fish Tissue	3/1/2016	65421
James	Jones Lake	SD-JA-L-JONES_01	Hand County	TSI	4/2/2003	9747
James	Lardy Lake	SD-JA-L-LARDY_01	Day County (Formerly SD-BS-L-LARDY_01)	Mercury in Fish Tissue	3/1/2016	64503
James	Lilly Lake	SD-JA-L-LILY_01	Day County	Mercury in Fish Tissue	3/1/2016	65422
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	Lake Louise	SD-JA-L-LOUISE_01	Hand County	Mercury in Fish Tissue	3/1/2016	65423
James	Loyalton Dam	SD-JA-L-LOYALTON_01	Edmunds County	TSI	4/2/2003	9748
James	Lynn Lake	SD-JA-L-LYNN_01	Day County	Mercury in Fish Tissue	3/1/2016	65424
James	Middle Lynn Lake	SD-JA-L-MID_LYNN_01	Day County (formerly SD-BS-L-MID_LYNN_01)	Mercury in Fish Tissue	3/1/2016	64505
James	Mina Lake	SD-JA-L-MINA_01	Edmunds County	TSI	4/2/2003	9749
James	Mina Lake	SD-JA-L-MINA_01	Edmunds County	Mercury in Fish Tissue	3/1/2016	65425
James	Lake Mitchell	SD-JA-L-MITCHELL_01	Davison County	Nutrients-special approval	4/22/1997	2254
James	Opitz Lake	SD-JA-L-OPITZ_01	Day County (Formerly SD-BS-L-OPITZ_01)	Mercury in Fish Tissue	03/1/2016	64507
James	Ravine Lake	SD-JA-L-RAVINE_01	Beadle County	TSI/fecal coliform	4/12/1999	976
James	Ravine Lake	SD-JA-L-RAVINE_01	Beadle County	Mercury in Fish Tissue	3/1/2016	65426
James	Lake Redfield	SD-JA-L-REDFIELD_01	Spink County	Nutrients/Sediment-special approval	4/12/1999	645/984
James	Reetz Lake	SD-JA-L-REETZ_01	Day County	Mercury in Fish Tissue	3/1/2016	65427
James	Richmond Lake	SD-JA-L-RICHMOND_01	Brown County	TSI	8/8/2007	33708
James	Richmond Lake	SD-JA-L-RICHMOND_01	Brown County	Mercury in Fish Tissue	3/1/2016	65428
James	Rosehill Lake	SD-JA-L-ROSEHILL_01	Hand County	TSI	4/2/2003	9750
James	South Buffalo Lake	SD-JA-L-SOUTH_BUFFALO_01	Marshall County (formerly SD-BS-L-SOUTH_BUFFALO_01)	Mercury in Fish Tissue	3/1/2016	65429
James	Staum Dam	SD-JA-L-STAUM_01	Beadle County	Mercury in Fish Tissue	3/1/2016	65430

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
James	Wilmarth Lake	SD-JA-L-WILMARTH_01	Aurora County	Mercury in Fish Tissue	3/1/2016	65431
James	Dawson Creek	SD-JA-R-DAWSON_01	James River to Lake Henry	*E. coli*/fecal coliform	6/2/2011	40437
James	Firesteel Creek	SD-JA-R-FIRESTEEL_01	West Fork Firesteel to mouth	Nutrients-special approval	4/22/1997	2254
James	James River	SD-JA-R-JAMES_08	Huron 3rd Street Dam to Sand Creek	Mercury in Fish Tissue	8/18/2016	65869
James	James River	SD-JA-R-JAMES_11	Yankton County line to mouth	Fecal coliform	3/24/2011	40029
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
James	Wolf Creek	SD-JA-R-WOLF_01	Wolf Creek Colony to S5, T103N, R56W	*E. coli*	04/16/2020	R8-SD-2020-01
James	Wolf Creek	SD-JA-R-WOLF_02	Just above Wolf Creek Colony to mouth	TSS	8/8/2011	41061
James	Wolf Creek	SD-JA-R-WOLF_02	Just above Wolf Creek Colony to mouth	*E. coli*	04/16/2020	R8-SD-2020-01
Little Missouri	Little Missouri River	SD-LM-R-LITTLE_MISSOURI_01	Montana border to North Dakota border	Mercury in Fish Tissue	3/1/2016	65433
Minnesota	Lake Alice	SD-MN-L-ALICE_01	Deuel County	TSI	6/3/2004	10622
Minnesota	Lake Alice	SD-MN-L-ALICE_01	Deuel County	Mercury in Fish Tissue	3/1/2016	65440
Minnesota	Big Stone Lake	SD-MN-L-BIG_STONE_01	Roberts County	Nutrients-special approval	12/26/1996	123
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

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Minnesota	Punished Woman Lake	SD-MN-L-PUNISHED_WOMAN_01	Codington County	TSI/Sediment	2/7/2001	1621
Minnesota	Summit Lake	SD-MN-L-SUMMIT_01	Grant County	Mercury in Fish Tissue	3/1/2016	65441
Minnesota	North Fork Yellow Bank River	SD-MN-R-YELLOW_BANK_N_FORK_01	SD/MN border to S27, T120N, R48W	*E. coli*	5/20/2018	R8-SD-2018-01
Minnesota	South Fork Yellow Bank River	SD-MN-R-YELLOW_BANK_S_FORK_01	SD/MN border to S33, T118N, R49W	*E. coli*	5/20/2018	R8-SD-2018-01
Missouri	Brakke Dam	SD-MI-L-BRAKKE_01	Lyman County	TSI	9/29/2004	10967
Missouri	Brakke Dam	SD-MI-L-BRAKKE_01	Lyman County	Mercury in Fish Tissue	3/1/2016	65434
Missouri	Burke Lake	SD-MI-L-BURKE_01	Gregory County	DO/pH/TSI	8/8/2007	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	Cottonwood Lake	SD-MI-L-COTTONWOOD_01	Sully County	Mercury in Fish Tissue	3/1/2016	65435
Missouri	Dante Lake	SD-MI-L-DANTE_01	Charles Mix County	TSI/DO	9/27/2006	31192
Missouri	Fate Dam	SD-MI-L-FATE_01	Lyman County	TSI	1/14/2005	11380
Missouri	Fate Dam	SD-MI-L-FATE_01	Lyman County	Mercury in Fish Tissue	03/1/2016	65436
Missouri	Geddes Lake	SD-MI-L-GEDDES_01	Charles Mix County	TSI/DO	5/6/2008	34513
Missouri	Hiddenwood Lake	SD-MI-L-HIDDENWOOD_01	Walworth County	TSI/Sediment	4/12/1999	632
Missouri	Lake Hurley	SD-MI-L-HURLEY_01	Potter County	Mercury in Fish Tissue	3/1/2016	64513
Missouri	McCook Lake	SD-MI-L-MCCOOK_01	Union County	TSI	4/12/1999	770
Missouri	Roosevelt Lake	SD-MI-L-ROOSEVELT_01	Tripp County	Mercury in Fish Tissue	3/01/2016	64514
Missouri	Choteau Creek	SD-MI-R-CHOTEAU_01	Lewis & Clark Lake to S34, T96N, R63W	TSS	5/6/2010	38613

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
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	Missouri River (Lake Oahe)	SD-MI-R-OAHE_01	North Dakota border to Oahe Dam	Mercury in Fish Tissue	3/1/2016	65439
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
Moreau	Coal Springs Reservoir	SD-MU-L-COAL_SPRINGS_01	Perkins County	Mercury in Fish Tissue	3/1/2016	64515
Moreau	Little Moreau No. 1	SD-MU-L-LITTLE_MOREAU_NO1_01	Dewey County	Mercury in Fish Tissue	3/1/2016	65442
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
Red River	White Lake	SD-RD-L-WHITE_01	Marshall County	DO/TSI	8/30/2006	31133
Vermillion	Turkey Ridge Creek		Vermillion River to S31, T98N, R53W	Fecal coliform	9/27/2006	31212
Vermillion	East Vermillion Lake	SD-VM-L-E_VERMILLION_01	McCook County	Mercury in Fish Tissue	3/1/2016	65443
Vermillion	Lake Henry	SD-VM-L-HENRY_01	Kingsbury County	Mercury in Fish Tissue	3/1/2016	65444
Vermillion	Swan Lake	SD-VM-L-SWAN_01	Turner County	TSI/Sediment	4/12/1999	1169/ 1168
Vermillion	Lake Thompson	SD-VM-L-THOMPSON_01	Kingsbury County	Mercury in Fish Tissue	3/1/2016	65445

River Basin	Waterbody	AUID	Segment or Lake Location	Impairment	TMDL Approved	TMDL ID
Vermillion	Whitewood Lake	SD-VM-L-WHITEWOOD_01	Kingsbury County	Mercury in Fish Tissue	3/1/2016	65446
Vermillion	Long Creek	SD-VM-R-LONG_01	Vermillion River to Highway 44	*E. Coli*	06/16/2021	R8-SD-2021-02
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	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	East Fork Vermillion River	SD-VM-R-VERMILLION_EAST_FORK_01	McCook/Lake County to Little Vermillion River	*E. coli*	11/07/2020	R8-SD-2021-01
Vermillion	West Fork Vermillion River	SD-VM-R-VERMILLION_WEST_FORK_01_USGS	Vermillion River to McCook-Miner County line	*E. Coli*	7/31/2019	R8-SD-2019-03

APPENDIX B

DANR 2022 WATERBODY DELISTING REPORT

Assessment Unit ID	Waterbody Name	Cause	Delisting Reason
SD-BF-R-DEADWOOD_01	Deadwood Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-BF-R-HORSE_01_USGS	Horse Creek	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-BF-R-WHITEWOOD_02	Whitewood Creek	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-BF-R-WHITEWOOD_07	Whitewood Creek	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-BS-L-ALBERT_01	Lake Albert	DISSOLVED OXYGEN	Applicable WQS attained; based on new data
SD-BS-L-BLUE_DOG_01	Blue Dog Lake	PH	Applicable WQS attained; based on new data
SD-BS-L-BULLHEAD_01	Bullhead Lake	CHLOROPHYLL-A	Applicable WQS attained; based on new data
SD-BS-L-GRASS_01	Grass Lake	MERCURY IN FISH TISSUE	Applicable WQS attained; based on new data
SD-BS-R-BEAVER_02	Beaver Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-BS-R-BIG_SIOUX_01	Big Sioux River	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-BS-R-BIG_SIOUX_02	Big Sioux River	DISSOLVED OXYGEN	Applicable WQS attained; based on new data
SD-BS-R-BIG_SIOUX_02	Big Sioux River	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-BS-R-BIG_SIOUX_08	Big Sioux River	MERCURY IN FISH TISSUE	Applicable WQS attained, according to new assessment method
SD-BS-R-BRULE_01	Brule Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-BS-R-SPLIT_ROCK_01_USGS	Split Rock Creek	TOTAL SUSPENDED SOLIDS	Applicable WQS attained; based on new data
SD-CH-L-CENTER_01	Center Lake	DISSOLVED OXYGEN	Applicable WQS attained; based on new data
SD-CH-L-NEW_WALL_01	New Wall Lake	PH	Applicable WQS attained; based on new data
SD-CH-L-STOCKADE_01	Stockade Lake	DISSOLVED OXYGEN	Applicable WQS attained; based on new data
SD-CH-L-SYLVAN_01	Sylvan Lake	DISSOLVED OXYGEN	Applicable WQS attained; based on new data
SD-CH-R-BEAVER_01	Beaver Creek	TOTAL DISSOLVED SOLIDS	Applicable WQS attained; based on new data
SD-CH-R-BOX_ELDER_01	Box Elder Creek	ESCHERICHIA COLI	Data and/or information lacking to determine WQ status; original basis for listing incorrect
SD-CH-R-CHERRY_01	Cherry Creek	SPECIFIC CONDUCTIVITY	Data and/or information lacking to determine WQ status; original basis for listing incorrect
SD-CH-R-RAPID_04	Rapid Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-GR-R-BULL_01	Bull Creek	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-GR-R-GRAND_01	Grand River	TEMPERATURE	Applicable WQS attained; based on new data
SD-JA-L-BYRON_01	Lake Byron	PH	Applicable WQS attained; based on new data

Assessment Unit ID	Waterbody Name	Cause	Delisting Reason
SD-JA-L-FOUR_MILE_01	Four Mile Lake	PH	Applicable WQS attained; based on new data
SD-JA-L-LOUISE_01	Lake Louise	PH	Applicable WQS attained; based on new data
SD-JA-L-MINA_01	Mina Lake	DISSOLVED OXYGEN	Applicable WQS attained; based on new data
SD-JA-L-MITCHELL_01	Lake Mitchell	TEMPERATURE	Applicable WQS attained; based on new data
SD-JA-L-ROY_01	Roy Lake	MERCURY IN FISH TISSUE	Applicable WQS attained; based on new data
SD-JA-R-DAWSON_01	Dawson Creek	TOTAL SUSPENDED SOLIDS	Applicable WQS attained; based on new data
SD-JA-R-JAMES_04	James River	TOTAL SUSPENDED SOLIDS	Applicable WQS attained; based on new data
SD-JA-R-JAMES_11	James River	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-JA-R-WOLF_01	Wolf Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-JA-R-WOLF_02	Wolf Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-MI-R-CROW_01	Crow Creek	TOTAL SUSPENDED SOLIDS	Applicable WQS attained; based on new data
SD-MN-L-BIG_STONE_01	Big Stone Lake	TEMPERATURE	Applicable WQS attained; based on new data
SD-MN-R-WHETSTONE_N_FORK_01	North Fork Whetstone River	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-MU-R-MOREAU_01	Moreau River	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-MU-R-MOREAU_02	Moreau River	TOTAL SUSPENDED SOLIDS	Applicable WQS attained; based on new data
SD-MU-R-MOREAU_03	Moreau River	ESCHERICHIA COLI	Applicable WQS attained; based on new data
SD-NI-L-DOG_EAR_01	Dog Ear Lake	MERCURY IN FISH TISSUE	Applicable WQS attained; based on new data
SD-RD-L-TRAVERSE_01	Lake Traverse	TEMPERATURE	Applicable WQS attained; based on new data
SD-VM-L-E_VERMILLION_01	East Vermillion Lake	TEMPERATURE	Applicable WQS attained; based on new data
SD-VM-R-LONG_01	Long Creek	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-VM-R-VERMILLION_E_FORK_01	East Fork Vermillion River	ESCHERICHIA COLI	TMDL Approved or established by EPA (4a)
SD-WH-R-WHITE_03	White River	SALINITY/SAR	Applicable WQS attained; based on new data

APPENDIX C

2022 305(b) REPORT

BASIN TABLES

KEY FOR RIVER BASIN INFORMATION TABLES

Waterbody AUID – Waterbody Assessment Unit Identification
Waterbody- Name of Waterbody
Location- Best available description or reach segment
Map ID- Map identification
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 and a TMDL is needed.

Support
Full = Full Support
Non = Nonsupport
INS = Insufficient sampling information (limited sample data)
NA = Not Assessed

Supporting Parameters
The waterbody meets criterion for the listed parameters.

Nonsupporting Parameters
The waterbody does not meet criterion for the listed parameters.

Parameter Codes:
Alkalinity (ALK); Arsenic (As); Ammonia (NH3); Cadmium (Cd); Chloride (Cl), Chlorophyll-a (CHL-A); Chromium (Cr); Copper (Cu); Cyanide (CN); Dissolved Oxygen (DO); Escherichia coli (ECOLI); Lead (Pb); Mercury in Fish Tissue (MeHg); Mercury Total (Hg); Nickel (Ni); Nitrate (NO3); pH (PH); Radium (Ra); Salinity (Sal); Selenium, total (Se); Silver (Ag); Sodium Adsorption Ratio (SAR); Specific Conductivity (SC); Sulfate (SO4); Uranium (U) Temperature (Temp); Total Dissolved Solids (TDS); Total Suspended Solids (TSS); Zinc (Zn)

Bad River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BA-L-COOKSTOVE_01 Cookstove Lake	Lyman County	L1	Fish and Wildlife Prop, Rec, Stock	NON	5	MeHg	
SD-BA-L-FREEMAN_01 Freeman Lake	Jackson County	L2	Warmwater Permanent Fish Life	NON	5	CHL-A, DO, Se	TSS
			Immersion Recreation	NON		CHL-A, DO	
			Limited Contact Recreation	NON		CHL-A, DO	
			Fish and Wildlife Prop, Rec, Stock	NON		NO3, SC, TDS	
SD-BA-L-HAYES_01 Hayes Lake	Stanley County	L2	Warmwater Semipermanent Fish Life	NON	5	CHL-A, DO,	ALK , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS, MeHG
			Immersion Recreation	NON		CHL-A, DO	
			Limited Contact Recreation	NON		CHL-A, DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-BA-L-MURDO_01 Murdo Dam	Jones County	L3	Warmwater Permanent Fish Life	NON	5	DO,	MeHG
			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-BA-L-RICHLAND_01 Richland Dam	Jones County	L4	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg
SD-BA-L-SHERIFF_01 Sheriff Dam	Jones County (FPNG)	L5	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-BA-L-WAGGONER_01 Waggoner Lake	Haakon County	L6	Domestic Water Supply	NON	5	CHL-A	ALK , DO , MeHG , NH3 , NO3 , PH , SC , Temp , TSS
			Warmwater Permanent Fish Life	NON		CHL-A	
			Immersion Recreation	NON		CHL-A	
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-BA-R-BAD_01 Bad River	Stanley County line to mouth	R1	Warmwater Marginal Fish Life	NON	5	TSS	DO, NH3 , NO3 , PH , Sal/SAR , TDS , Temp
			Limited Contact Recreation	NON		ECOLI	
			Fish and Wildlife Prop, Rec, Stock	FULL		SC	
			Irrigation Waters	NON			

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BA-R-S_FORK_BAD_01_USGS South Fork Bad River	Near Cottonwood, SD	R2	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NA NA NA NA	3		

Belle Fourche River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-L-BEARBUTTE_01 BearButte Lake	Meade County	L1	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg
SD-BF-L-IRON_CREEK_01 Iron Creek Lake	Lawrence County	L2	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	Temp	ALK, DO, NH3, NO3, PH, SC, TDS, TSS, ECOLI
SD-BF-L-MIRROR_EAST_01 Mirror Lake East	Lawrence County	L3	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	Temp	ALK , DO , NH3 , NO3 , PH SC , TDS , TSS
SD-BF-L-MIRROR_WEST_01 Mirror Lake West	Lawrence County	L4	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON INS INS FULL	5	Temp	ALK, DO, NH3, NO3, PH, SC, TDS, TSS
SD-BF-L-NEWELL_01 Newell Lake	Butte County	L5	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	4A	MeHg MeHg	ALK , DO , NH3 , NO3 , PH SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-L-NEWELL_CITY_01 Newell City Pond	Butte County	L6	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NA	5	Temp	
SD-BF-L-ORMAN_01 Orman Dam (Belle Fourche Reservoir)	Butte County	L7	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON INS INS NON FULL	4A	MeHg MeHg	ALK, CHL-A, NH3, NO3, PH, SC, Temp, TDS, TSS
SD-BF-R-ANNIE_01 Annie Creek	Spearfish Creek to S3, T4N, R2E	R1	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		Ag, AK , As , Cd , CN , Cr Cu , DO , ECOLI , Hg , NH3 , Ni , NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-BEAR_BUTTE_01 Bear Butte Creek	Headwaters to Strawberry Creek	R2	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL INS FULL INS	2		Ag , As , Cd , Cr, Cu , Hg , Ni , NO3 , Pb , PH , TDS , DO,SC, ECOLI, TSS , Zn TEMP
SD-BF-R-BEAR_BUTTE_02 Bear Butte Creek	Strawberry Creek to S2, T4N, R4E	R3	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NA FULL NA	2		Ag , ALK , As , Cd , Cr, Cu, Hg , Ni , NO3 , Pb , PH , TDS , TSS , Zn
SD-BF-R-BELLE_FOURCHE_01 Belle Fourche River	Wyoming border to Redwater River	R4	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	4A	TSS ECOLI	PH, SC, Temp
SD-BF-R-BELLE_FOURCHE_02 Belle Fourche River	Redwater River to Whitewood Creek	R5	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	5	ECOLI	DO, PH, SC Temp, TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-R-BELLE_FOURCHE_03 Belle Fourche River	Whitewood Creek to Willow Creek	R6	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	5	ECOLI	Ag , As , Cd , Cr , Cu , DO , Hg , MeHG , NH3 , Ni , NO3 Pb , PH , SC , Se , TDS , Temp , Zn, TSS, Sal/SAR
SD-BF-R-BELLE_FOURCHE_04 Belle Fourche River	Willow Creek to Alkali Creek	R7	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	5	TSS ECOLI	DO, NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp
SD-BF-R-BELLE_FOURCHE_05 Belle Fourche River	Alkali Creek to mouth	R8	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	4A	TSS ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-BF-R-CLEOPATRA_01 Cleopatra Creek	Confluence with East Branch Cleopatra Creek to mouth	R9	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		Ag , As , Cd , CN , Cr , Cu , DO , ECOLI , Hg , NH3 , Ni NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-CROW_01_USGS Crow Creek	S22, T6N, R1E to Redwater River	R10	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS INS INS INS	3		
SD-BF-R-DEADWOOD_01 Deadwood Creek	Rutabaga Gulch to Whitewood Creek	R11	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	4A	ECOLI	Ag , As , Cd , CN , Cr , Cu , DO , Hg , NH3 , Ni , NO3 , Pb , PH , SC , TDS , Temp TSS , Zn

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-R-ELM_01 Elm Creek	S8, T8N, R10E to Belle Fourche River	R12	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL NON	5	TSS ECOLI SC	DO , NH3 , NO3 , PH , TDS , Temp
SD-BF-R-FALSE_BOTTOM_01 False Bottom Creek	WB False Bottom to Burno Gulch Creek	R13	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		Ag , As , Cd , CN , Cr , Cu , DO , ECOLI , Hg , NH3 , Ni NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-FALSE_BOTTOM_02 False Bottom Creek	S26, T5N, R2E to W Branch False Bottom	R14	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NA NON NA	5	Se	
SD-BF-R-FANTAIL_01 Fantail Creek	Headwaters to Nevada Gulch	R15	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS INS INS INS INS	3		
SD-BF-R-HORSE_01_USGS Horse Creek	Indian Creek to mouth	R16	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	4A	TSS	DO , ECOLI , PH , SC , Temp
SD-BF-R-LITTLE_SPEARFISH_01_USGS Little Spearfish Creek	S16, T4N, R1E to Spearfish Creek	R17	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS NA INS INS	3		
SD-BF-R-REDWATER_01 Redwater River	US HWY 85 to mouth	R18	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-R-REDWATER_01_USGS Redwater River	WY border to Hwy 85	R19	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS NA INS INS	3		
SD-BF-R-SPEARFISH_01 Spearfish Creek	Intake Gulch to Annie Creek	R20	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters Commerce / Industry	FULL FULL FULL FULL FULL FULL FULL	1		Ag , As , Cd , CN , Cr , Cu , DO , ECOLI , MeHg, Hg , NH3 , Ni NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-SPEARFISH_02 Spearfish Creek	Annie Creek to Cleopatra Creek	R21	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters Commerce / Industry	FULL FULL FULL FULL FULL FULL FULL	1		Ag , As , Cd , Cr , Cu , DO , ECOLI , Hg , NH3 , Ni NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-SPEARFISH_04 Spearfish Creek	Cleopatra Creek to Spearfish City intake dam in S33, T6N, R2E	R22	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		Ag , As , Cd , MeHg , Cr , Cu , DO , ECOLI , Hg , NH3 , Ni NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-SPEARFISH_05 Spearfish Creek	Homestake Hydroelectric Plant at Spearfish in S15, T6N, R2E to Higgins Gulch	R23	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , MeHg, TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-R-SPEARFISH_06 Spearfish Creek	Higgens Gulch to mouth	R24	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BF-R-STEWART_01 Stewart Gulch	Whitetail Creek to NW1/4, NW1/4, S7, T4N, R3E	R25	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		Ag , As , Cd , Cr , Cu , DO , Hg , NH3 , Ni , NO3 , Pb , PH , SC , TDS , Temp ECOLI, TSS , Zn
SD-BF-R-STRAWBERRY_01 Strawberry Creek	Bear Butte Creek to S5, T4N, R4E	R26	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NA NON FULL	4A	Cd Cd	Ag , As , CN , Cu , NH3 , Ni Pb , PH , SC , Se , TDS , TSS , Zn, Hg
SD-BF-R-W_STRAWBERRY_01 West Strawberry Creek	Headwaters to mouth	R27	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS INS INS INS	3		
SD-BF-R-WHITETAIL_01 Whitetail Creek	Whitewood Creek to S18, T4N, R3E	R28	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		Ag , As , Cd , Cr , Cu , DO , ECOLI , Hg , NH3 , Ni NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-WHITEWOOD_01 Whitewood Creek	Whitetail Summit to Gold Run Creek	R29	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BF-R-WHITEWOOD_02 Whitewood Creek	Gold Run Creek to Deadwood Creek	R30	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		Ag , As , Cd , Cr , Cu , DO , Hg , NH3 , Ni , NO3 , Pb , PH , Sal/SAR , SC , TDS , Temp , TSS , Zn, ECOLI
SD-BF-R-WHITEWOOD_03 Whitewood Creek	Deadwood Creek to Spruce Gulch	R31	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	4A	ECOLI	Ag , As , Cd , Cr , Cu , DO , Hg , NH3 , Ni , NO3 , Pb , PH , SC , TDS , Temp , TSS , Zn
SD-BF-R-WHITEWOOD_04 Whitewood Creek	Spruce Gulch to Sandy Creek	R32	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	5	ECOLI	Ag , As , Cd , Cr Cu , DO , Hg , NH3 , Ni , NO3 , Pb , PH , Sal/SAR , SC , TDS , Temp , TSS , Zn
SD-BF-R-WHITEWOOD_05 Whitewood Creek	Sandy Creek to I-90	R33	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL FULL	5	PH	Ag , As , Cd , Cr Cu , DO , ECOLI , Hg , NH3 , Ni , NO3 , Pb , SC , TDS , Temp , TSS , Zn
SD-BF-R-WHITEWOOD_06 Whitewood Creek	I-90 to Crow Creek	R34	Warmwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL	5	PH	ALK , DO , ECOLI , NH3 , NO3 , SC , TDS , Temp , TSS
SD-BF-R-WHITEWOOD_07 Whitewood Creek	Crow Creek to mouth	R35	Warmwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		Ag , As , Cd , Cr , Cu , DO , Hg , NH3 , Ni , NO3 , Pb , PH , SC , TDS , Temp ECOLI, TSS , Zn

Big Sioux River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-L-ALBERT_01 Lake Albert	Kingsbury County	L1	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	CHL-A, MeHg CHL-A CHL-A MeHg	ALK , DO, ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-L-ALVIN_01 Lake Alvin	Lincoln County	L2	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	Temp CHL-A CHL-A	ALK, NH3, DO, ECOLI, MeHg, NO3, PH, SC, TDS, TSS
SD-BS-L-ANTELOPE_01 Antelope Lake	Day County	L3	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	4A	MeHg MeHg	
SD-BS-L-BEAVER_01 Beaver Lake	Minnehaha	L4	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHG
SD-BS-L-BITTER_01 Bitter Lake	Day County	L5	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	MeHg CHL-A CHL-A MeHg	ALK , DO , ECOLI, PH , SC, TDS , Temp , TSS
SD-BS-L-BLUE_DOG_01 Blue Dog Lake	Day County	L6	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK, NH3, CHL-A, DO, ECOLI, MeHg, NO3, PH, SC, Temp, TDS, TSS
SD-BS-L-BRANT_01 Brant Lake	Lake County	L7	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A , DO , ECOLI MeHG , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-L-BRUSH_01 Brush Lake	Brookings County	L8	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-BS-L-BULLHEAD_01 Bullhead Lake	Deuel County	L9	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A, DO , ECOLI , NH3 , NO3 , PH , SC , TDS, Temp , TSS
SD-BS-L-CAMPBELL_01 Lake Campbell	Brookings County	L10	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	CHL-A CHL-A CHL-A	ALK, NH3, DO, ECOLI, MeHG , NH3 , NO3 , SC , TDS , TSS
SD-BS-L-CLEAR_D_01 Clear Lake	Deuel County	L11	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NON NON FULL	5	ECOLI ECOLI	ALK, NH3, CHL-A, NO3, PH, SC, Temp, TDS , TSS
SD-BS-L-CLEAR_H_01 Clear Lake (Hamlin)	Hamlin County	L12	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg
SD-BS-L-COVELL_01 Covell Lake	Minnehaha County	L13	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	Temp CHL-A CHL-A PH	ALK, NH3, DO, ECOLI, NO3, SC , TDS , TSS
SD-BS-L-DIAMOND_01 Diamond Lake	Minnehaha County	L14	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHG
SD-BS-L-DRY_01 Dry Lake	Codington County	L15	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , MeHg, PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-L-DRY_NO2_01 Dry Lake Number 2	Clark County	L16	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	4A	MeHg MeHg	
SD-BS-L-E_OAKWOOD_01 East Oakwood Lake	Brookings County	L17	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	4A	CHL-A CHL-A CHL-A	ALK , DO , ECOLI , PH , SC , TDS , Temp , TSS
SD-BS-L-ENEMY_SWIM_01 Enemy Swim Lake	Day County	L18	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	4A	MeHg MeHg	ALK , CHL-A , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-L-GOLDSMITH_01 Goldsmith Lake	Brookings County	L19	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	MeHg CHL-A CHL-A MeHg	ALK , DO , ECOLI , NH3 , NO3 , PH SC , TDS , Temp , TSS
SD-BS-L-GOOSE_01 Goose Lake	Codington County	L20	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-BS-L-GRASS_01 Grass Lake	Codington County	L21	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg
SD-BS-L-HERMAN_01 Lake Herman	Lake County	L22	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A , DO , ECOLI MeHg , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-L-ISLAND_N_01 North Island Lake	Minnehaha/McCook counties (formerly SD-VM-L-ISLAND_N_01)	L23	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	4A	MeHg MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-L-KAMPESKA_01 Lake Kampeska	Codington County	L24	Domestic Water Supply Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NON FULL FULL NON	4A	 MeHg MeHg	DO , ECOLI , NH3 , NO3 , PH , SC , Temp , TDS , TSS
SD-BS-L-LAKOTA_01 Lakota Lake	Lincoln County	L25	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ECOLI, NO3, TSS
SD-BS-L-LONG_COD_01 Long Lake	Codington County	L26	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-BS-L-MADISON_01 Lake Madison	Lake County	L27	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	4A	CHL-A CHL-A CHL-A	ALK , DO , ECOLI , MeHG , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-L-MARSH_01 Lake Marsh	Hamlin County	L28	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NA NA NA NA	3		
SD-BS-L-MINNEWASTA_01 Minnewasta Lake	Day County	L29	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	CHL-A, MeHg CHL-A CHL-A MeHg	
SD-BS-L-NORDEN_01 Lake Norden	Hamlin County	L30	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NON NON FULL	5	 DO DO	ALK, NH3, CHL-A, ECOLI NO3, PH, SC, Temp, TDS, TSS
SD-BS-L-PELICAN_01 Pelican Lake	Codington County	L31	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , NH3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-L-PICKEREL_01 Pickerel Lake	Day County	L32	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A , DO , ECOLI MeHG , PH , TDS , Temp , TSS
SD-BS-L-POINSETT_01 Lake Poinsett	Hamlin County	L33	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	4A	MeHg CHL-A, ECOLI CHL-A, ECOLI MeHg	ALK , CHL-A , DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-L-REID_01 Reid Lake	Clark County	L34	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON INS INS NON	4A	MeHg MeHg	
SD-BS-L-RUSH_01 Rush Lake	Day County	L35	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	4A	MeHg MeHg	
SD-BS-L-SCHOOL_01 School Lake	Deuel County	L36	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	PH CHL-A CHL-A	ALK, NH3, DO, ECOLI , SC, Temp, TDS, TSS
SD-BS-L-SCOTT_01 Scott Lake	Minnehaha County	L37	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	5	MeHg MeHg	
SD-BS-L-SINAI_01 Lake Sinai	Brookings County	L38	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON INS INS NON	4A	MeHg MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-L-ST_JOHN_01 Lake St. John	Hamlin County	L39	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , NH3 , CHL-A , DO , ECOLI , NH3 , NO3 , SC , TDS , TSS
SD-BS-L-SWAN_01 Swan Lake	Clark County	L40	Fish and Wildlife Prop, Rec, Stock	FULL	1		MeHG
SD-BS-L-TWIN_01 Twin Lakes/W. Hwy 81	Kingsbury County	L41	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON FULL NON	5	MeHg ECOLI MeHg	ALK , NH3 , CHL-A , NO3 , PH , SC , Temp
SD-BS-L-TWIN_02 Twin Lakes	Minnehaha County	L42	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	4A	MeHg MeHg	
SD-BS-L-W_OAKWOOD_01 West Oakwood Lake	Brookings County	L43	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	4A	CHL-A CHL-A CHL-A	ALK, NH3, DO, ECOLI, MeHG , NH3 , NO3, PH, SC, Temp, TDS, TSS
SD-BS-L-WALL_01 Wall Lake	Minnehaha County	L44	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	5	DO DO DO	ALK, NH3, CHL-A, ECOLI, MeHg, NO3, TDS, TSS
SD-BS-L-WAUBAY_01 Waubay Lake	Day County	L45	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	CHL-A, MeHg CHL-A CHL-A MeHg	ALK, NH3, DO, ECOLI , NO3, PH, SC, Temp, TDS, TSS
SD-BS-R-BACHELOR_01 Bachelor Creek	S28, T106N, R 50W to Big Sioux River	R1	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON FULL	5	DO ECOLI	NH3 , NO3 , PH , SC , TDS , TSS , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
			Irrigation Waters	FULL			
SD-BS-R-BEAVER_01 Beaver Creek	Big Sioux River to S9, T98N, R49W	R2	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-R-BEAVER_02 Beaver Creek	Split Rock Creek to South Dakota-Minnesota border	R3	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	4A	ECOLI	DO , PH , SC , Temp , TSS
SD-BS-R-BIG_SIOUX_01 Big Sioux River	S28, T121N, R52W to Lake Kampeska	R4	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO, ECOLI	NH3 , NO3 , PH , Sal/SAR SC , TDS , Temp , TSS
SD-BS-R-BIG_SIOUX_02 Big Sioux River	Lake Kampeska to Willow Creek	R5	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		ALK , NH3 , NO3 , PH , Sal/SAR , DO, SC , TDS , ECOLI, Temp TSS
SD-BS-R-BIG_SIOUX_03 Big Sioux River	Willow Creek to Stray Horse Creek	R6	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	4A	ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , TSS
SD-BS-R-BIG_SIOUX_04 Big Sioux River	Stray Horse Creek to near Volga	R7	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO	ALK , ECOLI , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp , TSS
SD-BS-R-BIG_SIOUX_05 Big Sioux River	Near Volga to Brookings	R8	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL	5	TSS	ALK , DO , ECOLI , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-R-BIG_SIOUX_06 Big Sioux River	Brookings to Brookings/Moody County Line	R9	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL	5	TSS	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-BS-R-BIG_SIOUX_07 Big Sioux River	Brookings/Moody County Line to S2, T104N, R49W	R10	Domestic Water Supply Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL NON FULL	4A	MeHg, TSS MeHg	ALK , Cl , DO , ECOLI , NH3 , NO3 , PH , Sal/SAR SC , SO4 , TDS , Temp
SD-BS-R-BIG_SIOUX_08 Big Sioux River	S2, T104N, R49W to I-90	R11	Domestic Water Supply Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON NON NON FULL FULL	4A	 TSS ECOLI ECOLI	ALK , Cl , DO , NH3 , NO3 PH , Sal/SAR , SC , SO4 , TDS , Temp, MeHg
SD-BS-R-BIG_SIOUX_10 Big Sioux River	I-90 to diversion return	R12	Domestic Water Supply Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON NON FULL FULL	5	TDS TSS ECOLI ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC, Temp
SD-BS-R-BIG_SIOUX_11 Big Sioux River	Diversion return to SF WWTF	R13	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	TSS ECOLI ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-BS-R-BIG_SIOUX_12 Big Sioux River	SF WWTF to above Brandon	R14	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	TSS ECOLI ECOLI	ALK, DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-R-BIG_SIOUX_13 Big Sioux River	Above Brandon to Nine Mile Creek	R15	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	5	TSS ECOLI ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp
SD-BS-R-BIG_SIOUX_14 Big Sioux River	Nine Mile Creek to near Fairview	R16	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	5	TSS ECOLI ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp, MeHg
SD-BS-R-BIG_SIOUX_15 Big Sioux River	Fairview to near Alcester	R17	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	TSS ECOLI ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp
SD-BS-R-BIG_SIOUX_16 Big Sioux River	Near Alcester to Indian Creek	R18	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	TSS ECOLI ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp
SD-BS-R-BIG_SIOUX_17 Big Sioux River	Indian Creek to mouth	R19	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	TSS ECOLI ECOLI	ALK , DO , NH3 , NO3 , PH SC , TDS , Temp
SD-BS-R-BRULE_01 Brule Creek	Big Sioux River to confluence of its east and west forks	R20	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-R-EAST_BRULE_01 East Brule Creek	confluence with Brule Creek to S3, T95N, R49W	R21	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	ALK, DO , PH , Temp NO3, NH3, SC
SD-BS-R-FLANDREAU_01 Flandreau Creek	Big Sioux River to Minnesota Border	R22	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS NON INS INS	5	ECOLI	
SD-BS-R-HIDEWOOD_01 Hidewood Creek	Big Sioux River to U.S. Highway 15	R23	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	ALK, DO , PH , SC NO3, NH3, Temp, TDS, TSS
SD-BS-R-MEDARY_01 Medary Creek	MN border to Big Sioux River	R24	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-R-PEG_MUNKY_RUN_01 Peg Munky Run	Big Sioux River to S17, T113N, R50W	R25	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , PH , SC , Temp ALK, NO3, TDS, TSS
SD-BS-R-PIPESTONE_01 Pipestone Creek	SD/MN border in Minnehaha County to SD/MN border in Moody County	R26	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	5	TSS ECOLI ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp, TSS
SD-BS-R-SIXMILE_01 Six Mile Creek	Big Sioux River to S30, T112N, R48W	R27	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	DO, ECOLI	ALK , NH3 , NO3 , PH , SC TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-BS-R-SKUNK_01 Skunk Creek	Brandt Lake to Big Sioux River	R28	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp TSS
SD-BS-R-SPLIT_ROCK_01_USGS Split Rock Creek	West Pipestone Creek to Big Sioux River	R29	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON NON FULL FULL	5	ECOLI ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp, TSS
SD-BS-R-SPLIT_ROCK_02 Split Rock Creek	SD/MN border to West Pipestone Creek	R30	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON NON FULL FULL	5	ECOLI ECOLI	DO , NO3 , PH , SC , Temp, TSS
SD-BS-R-SPRING_01 Spring Creek	Big Sioux River to S22, T109, R47W	R31	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	ALK, DO, NH3, NO3, PH, SC, Temp, TDS
SD-BS-R-STRAYHORSE_01 Stray Horse Creek	Big Sioux River to S26, T116N, R51W	R32	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-BS-R-UNION_01 Union Creek	Big Sioux River to confluence with East and West Forks	R33	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	ALK, DO, NH3, NO3 PH, SC Temp, TDS
SD-BS-R-WILLOW_01 Willow Creek	Big Sioux River to S7, T117N, R50W	R34	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI DO	NH3 , NO3 , PH , SC TDS Temp , TSS

Cheyenne River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-L-ANGOSTURA_01 Angostura Reservoir	Fall River County	L1	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		ALK, NH3, DO, ECOLI, MeHg, NO3, PH, SC, TDS, TSS
SD-CH-L-BISMARK_01 Bismark Lake	Custer County	L2	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-CH-L-CANYON_01 Canyon Lake	Pennington County	L3	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS INS	3		
SD-CH-L-CENTER_01 Center Lake	Custer County	L4	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	PH, Temp	ALK , DO , ECOLI , NH3 , NO3 , SC, TDS, TSS
SD-CH-L-COLD_BROOK_01 Cold Brook Reservoir	Fall River County	L5	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	Temp	ALK , DO , ECOLI , NH3 , NO3 , PH , TDS , TSS
SD-CH-L-COTTONWOOD_SPRINGS_01 Cottonwood Springs Lake	Fall River County	L6	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A , DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-L-CURLEW_01 Curlew Lake	Meade County	L7	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL INS INS FULL	2		MeHg, NO3
SD-CH-L-DEERFIELD_01 Deerfield Lake	Pennington County	L8	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	Temp	ALK , DO , ECOLI , MeHG NH3 , NO3 , PH , SC , TDS TSS
SD-CH-L-DURKEE_01 Durkee Lake	Meade County	L9	Domestic Water Supply Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON FULL FULL NON	5	PH MeHg MeHg	ALK, NH3, DO, ECOLI, NO3, SC, Temp, TDS, TSS
SD-CH-L-HORSETHIEF_01 Horsethief Lake	Pennington County	L10	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	5	PH Temp	ALK, NH3, DO, ECOLI, NO3, SC, TDS, TSS
SD-CH-L-LAKOTA_01 Lakota Lake	Custer County	L11	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-L-LEGION_01 Legion Lake	Custer County	L12	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	4A	PH	ALK , DO , ECOLI, NH3 , NO3 , SC TDS , Temp , TSS
SD-CH-L-NEW_UNDERWOOD_01 New Underwood Lake	Pennington County	L13	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHG

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-L-NEW_WALL_01	Pennington County	L14	Warmwater Permanent Fish Life	NON	5	DO	ALK, NH3, NO3, PH, SC Temp, TDS, TSS
New Wall Lake			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-CH-L-PACTOLA_01	Pennington County	L15	Domestic Water Supply	FULL	5		ALK , DO , MeHG , NH3 , NO3 , PH , SC , TDS , TSS
Pactola Reservoir			Coldwater Permanent Fish Life	NON		Temp	
			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
SD-CH-L-SHERIDAN_01	Pennington County	L16	Coldwater Permanent Fish Life	NON	5	MeHg, Temp	ALK , CHL-A , DO , ECOLI NH3 , NO3 , SC , TDS , TSS
Sheridan Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-CH-L-STOCKADE_01	Custer County	L17	Coldwater Marginal Fish Life	NON	5	MeHg	ALK , DO, ECOLI , NH3 , NO3 , PH , SC , TDS , TSS
Stockade Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-CH-L-SYLVAN_01	Custer County	L18	Coldwater Permanent Fish Life	NON	5	Temp	ALK , NH3 , DO, NO3 , PH , SC , TDS , TSS
Sylvan Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-CH-R-BATTLE_01	Near Horsethief Lake to Teepee Gulch Creek	R1	Coldwater Permanent Fish Life	FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
Battle Creek			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
SD-CH-R-BATTLE_01_USGS	Hwy 79 to mouth	R2	Warmwater Marginal Fish Life	INS	3		
Battle Creek			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	INS			
			Irrigation Waters	INS			

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-R-BATTLE_02 Battle Creek	Teepee Gulch Creek to SD HWY 79	R3	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-BEAVER_01 Beaver Creek	WY border to Cheyenne River	R4	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL NON	5	SC	ALK , As , DO , ECOLI , NH3 , NO3 , PH , Ra , Sal/SAR , Temp , TSS, TDS
SD-CH-R-BEAVER_01_USGS Beaver Creek	Near Buffalo Gap	R5	Warmwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS INS INS INS	3		
SD-CH-R-BEAVER_02_USGS Beaver Creek	S13, T5S, R4E to SD Hwy 79	R6	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS, ECOLI
SD-CH-R-BOX_ELDER_01 Box Elder Creek	Cheyenne River to S22, T2N, R8E	R7	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		ALK , DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp TSS
SD-CH-R-BOX_ELDER_02 Box Elder Creek	S16, T2N, R6E to S14, T3N, R4E	R8	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-CASCADE_01 Cascade Creek	headwaters to Cheyenne River	R9	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-R-CASTLE_01 Castle Creek	Deerfield Reservoir to Rapid Creek	R10	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-CHERRY_01 Cherry Creek	Cheyenne River to Sulphur Creek	R11	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS INS INS INS	3		
SD-CH-R-CHEYENNE_01 Cheyenne River	WY border to Beaver Creek	R12	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON INS NON NON	5	TSS TDS Sal/ SAR, SC	
SD-CH-R-CHEYENNE_02 Cheyenne River	Beaver Creek to Cascade Creek	R13	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL NON	5	TSS ECOLI SC	As , DO , NH3 , NO3 , PH , Ra , Sal/SAR , TDS , Temp, U
SD-CH-R-CHEYENNE_02B Cheyenne River	Cascade Creek to Angostura Reservoir	R14	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL	5	TSS	ALK , As , DO , ECOLI , NH3 , NO3 , PH , Ra , U, Sal/SAR , SC , TDS , Temp
SD-CH-R-CHEYENNE_03 Cheyenne River	Fall River to Cedar Creek	R15	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp
SD-CH-R-CHEYENNE_04 Cheyenne River	Cedar Creek to Belle Fourche River	R16	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-R-CHEYENNE_05 Cheyenne River	Belle Fourche River to Bull Creek	R17	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	5	TSS ECOLI	ALK , DO , MeHG , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-CH-R-CHEYENNE_06 Cheyenne River	Bull Creek to Lake Oahe	R18	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp
SD-CH-R-ELK_01_USGS Elk Creek	S9, T3N, R7E to S27, T4N, R3E	R19	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-FALL_01 Fall River	Hot Springs to mouth	R20	Warmwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-CH-R-FLYNN_01 Flynn Creek	SF Lame Johnny Creek to S23, T4S, R5E	R21	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-FRENCH_01 French Creek	S23, T3S, R3E to Custer	R22	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-CH-R-FRENCH_02 French Creek	Custer to Stockade Lake	R23	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
			Irrigation Waters	FULL			
SD-CH-R-FRENCH_03 French Creek	Stockade Lake to SD HWY 79	R24	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-GRACE_COOLIDGE_01 Grace Coolidge Creek	S12, T3S, R5E to Battle Creek	R25	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-GRIZZLY_BEAR_01_USGS Grizzly Bear Creek	Near Keystone, SD	R26	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-HIGHLAND_01_USGS Highland Creek	Wind Cave Natl Park and near Pringle, SD	R27	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON INS INS INS	5	PH, Temp	
SD-CH-R-HORSEHEAD_01_USGS Horsehead Creek	At Oelrichs	R28	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS INS INS NON	5	 SC	
SD-CH-R-IRON_01 Iron Creek	From Battle Creek to S33, T2S, R5E	R29	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-RAPID_01 Rapid Creek	Headwaters to Pactola Reservoir	R30	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL FULL	1		Cl , DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , SO4 , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-R-RAPID_02 Rapid Creek	Pactola Reservoir to Canyon Lake	R31	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL FULL	1		Cl , DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , SO4 , TDS , Temp , TSS
SD-CH-R-RAPID_03 Rapid Creek	Canyon Lake to S15, T1N, R8E	R32	Domestic Water Supply Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL NON NON FULL FULL	5	 ECOLI ECOLI 	Cl , DO , NH3 , NO3 , PH , Sal/SAR , SC , SO4 , TDS , Temp , TSS
SD-CH-R-RAPID_04 Rapid Creek	S15, T1N, R8E to above Farmingdale	R33	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON NON FULL FULL	4A	 ECOLI ECOLI 	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp TSS
SD-CH-R-RAPID_05 Rapid Creek	Above Farmingdale to Cheyenne River	R34	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	TSS ECOLI ECOLI 	DO , MeHG , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-CH-R-RAPID_N_FORK_01 North Fork Rapid Creek	From confluence with Rapid Creek to S8, T3N, R3E	R35	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-RHOADS_FORK_01_USGS Rhoads Fork	Near Rochford, SD	R36	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-CH-R-SPRING_01 Spring Creek	S5, T2S, R3E to Sheridan Lake	R37	Coldwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-SPRING_02 Spring Creek	Sheridan Lake to SD HWY 79	R38	Coldwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-CH-R-VICTORIA_01_USGS Victoria Creek	Rapid Creek to S19, T1N, R6E	R39	Coldwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NA NA NA	5	Temp	

Grand River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-GR-L-EAST_LEMMON_01 East Lemmon Lake	Perkins County	L1	Warmwater Semipermanent Fish Life	NON	5	MeHg	
			Immersion Recreation	NA			
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-GR-L-FLAT_CREEK_01 Flat Creek Dam	Perkins County	L2	Warmwater Semipermanent Fish Life	FULL	2		
			Immersion Recreation	INS			MeHG
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-GR-L-GARDNER_01 Lake Gardner	Harding County	L3	Warmwater Permanent Fish Life	FULL	1		
			Immersion Recreation	FULL			ALK , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-GR-L-ISABEL_01 Lake Isabel	Dewey County	L4	Domestic Water Supply	INS	5		
			Warmwater Permanent Fish Life	NON		CHL-A, MeHg	
			Immersion Recreation	NON		CHL-A	
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-GR-L-PUDWELL_01 Pudwell Dam	Corson County	L5	Warmwater Permanent Fish Life	NON	5	MeHg	
			Immersion Recreation	NA			
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-GR-L-SHADEHILL_01 Shadehill Reservoir	Perkins County	L6	Warmwater Permanent Fish Life	NON	5	MeHg	
			Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
			Irrigation Waters	NON		Sal/SAR	
SD-GR-R-BULL_01 Bull Creek	SF Grand River to S15, T21N, R5E	R1	Warmwater Marginal Fish Life	FULL	5		
			Limited Contact Recreation	FULL			As , DO , NH3 , NO3 , PH , Ra , SC , TDS , Temp , ECOLI, TSS, U
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-GR-R-CROOKED_01		R2	Warmwater Marginal Fish Life	FULL	5		
Crooked Creek	ND border to S34, T23N, R5E		Limited Contact Recreation	FULL			As , DO , NH3 , NO3 , PH , Ra , Temp , TSS
			Fish and Wildlife Prop, Rec, Stock	NON		TDS	
			Irrigation Waters	NON		Sal/SAR, SC	
SD-GR-R-GRAND_01		R3	Coldwater Marginal Fish Life	FULL	5		
Grand River	Shadehill Reservoir to Corson County line		Limited Contact Recreation	FULL			As , DO , ECOLI , NH3 , NO3 , PH , Ra , SC , TDS , Temp, TSS, U
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-GR-R-GRAND_02		R4	Warmwater Permanent Fish Life	NON	5	TSS	
Grand River	Corson County line to Bullhead		Limited Contact Recreation	FULL			DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-GR-R-GRAND_03		R5	Warmwater Permanent Fish Life	NON	5	TSS	
Grand River	Bullhead to mouth		Limited Contact Recreation	FULL			DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-GR-R-GRAND_N_FORK_01		R6	Warmwater Marginal Fish Life	FULL	5		
Grand River, North Fork	North Dakota border to Shadehill Reservoir		Immersion Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR, SC	
SD-GR-R-GRAND_S_FORK_01		R7	Warmwater Semipermanent Fish Life	NON	5	TSS	
Grand River, South Fork	S13, T18N, R3E to SD Hwy 79		Limited Contact Recreation	NON		ECOLI	As , DO , NH3 , NO3 , PH , Ra , SC , TDS , Temp, U
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-GR-R-GRAND_S_FORK_02		R8	Warmwater Semipermanent Fish Life	NON	5	TSS	
Grand River, South Fork	SD Hwy 79 to Shadehill Reservoir		Immersion Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	

James River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-AMSDEN_01 Amsden Dam	Day County	L1	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	4A	MeHg MeHg	ALK , CHL-A , DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-JA-L-BEAVER_01 Beaver Lake	Yankton County	L2	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NON NON FULL	5	 DO DO 	ALK, ECOLI, NO3, PH, SC, Temp, TDS, TSS
SD-JA-L-BIERMAN_01 Bierman Dam	Spink County	L3	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	CHL-A CHL-A CHL-A 	ALK , NH3 , NO3 , SC , TDS , TSS
SD-JA-L-BULLHEAD_02 Bullhead Lake	Marshall County (formerly SD-BS-L-BULLHEAD_02)	L4	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-JA-L-BYRON_01 Lake Byron	Beadle County	L5	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	4A	CHL-A CHL-A CHL-A 	ALK, NH3, DO, ECOLI, MeHG, NO3, PH, SC, Temp, TDS, TSS
SD-JA-L-CARTHAGE_01 Lake Carthage	Miner County	L6	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	CHL-A CHL-A CHL-A 	ALK , DO , NH3 , NO3 , MeHg, PH , SC , TDS , Temp , TSS
SD-JA-L-CATTAIL_01 Cattail Lake	Marshall County (formerly SD-BS-L-CATTAIL_01)	L7	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , MeHg NH3 , NO3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-CAVOUR_01 Lake Cavour	Beadle County	L8	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL INS INS FULL	2		MeHg
SD-JA-L-CLEAR_M_01 Clear Lake	Marshall County (formerly SD-BS-L-CLEAR_M_01)	L9	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	5	MeHg MeHg	ALK , CHL-A , DO , NH3 , NO3 , PH , SC , TDS , TSS
SD-JA-L-CLUBHOUSE_01 Clubhouse Lake	Marshall County	L10	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-JA-L-COTTONWOOD_01 Cottonwood Lake	Spink County	L11	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	4A	MeHg MeHg	ALK, NH3, CHL-A, DO, ECOLI, NO3, PH, SC Temp, TDS, TSS
SD-JA-L-COTTONWOOD_M_01 Cottonwood Lake	Marshall County (formerly SD-BS-L-COTTONWOOD_01)	L12	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	PH	ALK , DO , ECOLI , NH3 , NO3 , SC , TDS , Temp , TSS
SD-JA-L-CRESBARD_01 Cresbard Lake	Faulk County	L13	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON INS	5	CHL-A, PH CHL-A CHL-A	
SD-JA-L-DIMOCK_01 Dimock Lake	Hutchinson County	L14	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHG

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-ELM_01	Brown County	L15	Domestic Water Supply	FULL	5		ALK , NH3 , NO3 , PH , SC , TDS , TSS
Elm Lake			Warmwater Permanent Fish Life	NON		MeHg	
			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-FAULKTON_01	Faulk County	L16	Warmwater Semipermanent Fish Life	NON	5	CHL-A, DO, MeHg, PH	ALK , NH3 , NO3 , TDS , Temp , TSS
Lake Faulkton			Immersion Recreation	NON		CHL-A, DO	
			Limited Contact Recreation	NON		CHL-A, DO	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-FOUR_MILE_01	Marshall County (formerly SD-BS-L-FOUR_MILE_01)	L17	Warmwater Marginal Fish Life	FULL	2		DO, PH, SC, Temp
Four Mile Lake			Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-HANSON_01	Hanson County	L18	Warmwater Semipermanent Fish Life	NON	5	MeHg	
Lake Hanson			Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-HAZELDON_01 Hazeldon Lake	Day County	L19	Fish and Wildlife Prop, Rec, Stock	FULL	1		MeHg
SD-JA-L-HENRY_01	Near Scotland, SD	L20	Warmwater Permanent Fish Life	NON	5	DO, MeHg	ALK , ECOLI , NH3 , NO3 PH , SC , TDS , Temp , TSS
Henry Reservoir			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-HORSESHOE_01	Marshall County	L21	Warmwater Marginal Fish Life	NON	4A	MeHg	
Horseshoe Lake			Immersion Recreation	NA			
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-JAIL_POND_01 Jail Pond	Aurora County	L22	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-JA-L-JONES_01 Jones Lake	Hand County	L23	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON INS INS INS	5	PH	
SD-JA-L-LARDY_01 Lardy Lake	Day County (Formerly SD-BS-L-LARDY_01)	L24	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-JA-L-LATHAM_01 Latham	Faulk County	L25	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON INS	5	DO DO DO	
SD-JA-L-LILY_01 Lily Lake	Day County	L26	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-JA-L-LOUISE_01 Lake Louise	Hand County	L27	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	DO, MeHg, DO DO MeHg	ALK , NH3 , ECOLI , NO3 PH , SC , TDS , TSS
SD-JA-L-LYNN_01 Lynn Lake	Day County	L28	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	4A	MeHg MeHg	
SD-JA-L-MENNO_01 Menno, Lake	Hutchinson County	L29	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL INS INS FULL	2		MeHG
SD-JA-L-MID_LYNN_01 Middle Lynn Lake	Day County (formerly SD-BS-L-MID_LYNN_01)	L30	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-MINA_01 Mina Lake	Edmunds County	L31	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	4A	MeHg MeHg	ALK , NH3 , NO3 , DO , PH , SC , TDS , Temp , TSS
SD-JA-L-MITCHELL_01 Lake Mitchell	Davison County	L32	Domestic Water Supply Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON FULL	5	CHL-A CHL-A, CHL-A CHL-A	ALK , DO , ECOLI , NH3 , NO3 , PH , SC , Temp , TDS , TSS
SD-JA-L-N_BUFFALO_01 North Buffalo Lake	Marshall County (formerly SD-BS-L-N_BUFFALO_01)	L33	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	5	MeHg MeHg	ALK , DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-JA-L-NINE_MILE_01 Nine Mile Lake	Marshall County (formerly SD-BS-L-NINE_MILE_01)	L34	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	5	PH PH	ALK, NH3, DO, ECOLI, NO3, SC, Temp, TDS, TSS
SD-JA-L-NORTH_SCATTERWOOD_01 North Scatterwood Lake	Edmunds County	L35	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-JA-L-OPITZ_01 Opitz Lake	Day County (Formerly SD-BS-L-OPITZ_01)	L36	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-JA-L-PIERPONT_01 Pierpont Lake	Day County	L37	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	Temp	ALK , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , TSS
SD-JA-L-PIYAS_01 Piyas Lake	Marshall	L38	Fish and Wildlife Prop, Rec, Stock	NON	5	MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-RAVINE_01	Beadle County	L39	Warmwater Semipermanent Fish Life	NON	5	DO, MeHg, PH	ALK , NH3 , NO3 , ECOLI SC , TDS , Temp , TSS
Ravine Lake			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-REDFIELD_01	Spink County	L40	Warmwater Marginal Fish Life	NON	5	DO	ALK , MeHG, NH3 , NO3 PH , TDS , Temp , TSS
Lake Redfield			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-REETZ_01 Reetz Lake	Day County	L41	Fish and Wildlife Prop, Rec, Stock	NON	4A	MeHg	
SD-JA-L-RICHMOND_01	Brown County	L42	Warmwater Permanent Fish Life	NON	4A	MeHg	ALK, NH3, DO, ECOLI, NO3, PH, SC, Temp TDS, TSS
Richmond Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-ROSETTE_01	Edmunds County	L43	Warmwater Marginal Fish Life	NON	5	CHL-A	
Rosette Lake			Immersion Recreation	NON		CHL-A	
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-ROY_01	Marshall County (formerly SD-BS-L-ROY_01)	L44	Warmwater Permanent Fish Life	FULL	1		ALK , CHL-A , DO , ECOLI , MeHg , NH3 , NO3 , PH , SC , TDS , TSS
Roy Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-S_RED_IRON_01	Marshall County (formerly SD-BS-L-S_RED_IRON_01)	L45	Warmwater Permanent Fish Life	FULL	1		ALK , CHL-A , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
South Red Iron Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-SOUTH_BUFFALO_01	Marshall County (formerly SD-BS-L-SOUTH_BUFFALO_01)	L46	Warmwater Semipermanent Fish Life	NON	4A	MeHg	ALK , CHL-A , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
South Buffalo Lake			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-L-STAUM_01	Beadle County	L47	Warmwater Semipermanent Fish Life	NON	4A	MeHg	
Staum Dam			Immersion Recreation	NA			
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-STINK_01	Codington County						
Stink Lake		L48	Fish and Wildlife Prop, Rec, Stock	NON	5	MeHg	
SD-JA-L-TWIN_01	Sanborn County	L49	Warmwater Semipermanent Fish Life	NON	5	CHL-A, DO	
Twin Lakes			Immersion Recreation	NON		CHL-A, DO	ALK , NH3 , NO3 , PH , SC , TDS , Temp , TSS
			Limited Contact Recreation	NON		CHL-A, DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-TWIN_02	Spink County	L50	Warmwater Semipermanent Fish Life	FULL	1		
Twin Lakes			Immersion Recreation	FULL			ALK , DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-JA-L-WILMARTH_01	Aurora County	L51	Warmwater Permanent Fish Life	NON	5	MeHg, PH	
Wilmarth Lake			Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-JA-L-WYLIE_01	Brown County	L52	Warmwater Marginal Fish Life	INS	3		
Wylie Lake			Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	INS			
SD-JA-R-DAWSON_01	James River to Lake Henry	R1	Warmwater Marginal Fish Life	FULL	4A		
Dawson Creek			Limited Contact Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp, TSS
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-R-ELM_01 Elm River	Elm Lake to mouth	R2	Domestic Water Supply Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL FULL	5	TDS	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , Temp , TSS
SD-JA-R-FIRESTEEL_01 Firesteel Creek	West Fork Firesteel Creek to mouth	R3	Domestic Water Supply Warmwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON NON FULL FULL	5	TDS Temp, TSS ECOLI, DO	NH3 , NO3 , PH , Sal/SAR , SC
SD-JA-R-FOOT_01_USGS Foot Creek	Near Aberdeen, SD	R4	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON INS INS	5	DO DO	
SD-JA-R-JAMES_01 James River	North Dakota border to Mud Lake Reservoir	R5	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , TSS
SD-JA-R-JAMES_02 James River	Mud Lake Reservoir	R6	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-JAMES_03 James River	Columbia Road Reservoir	R7	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO	ECOLI , NH3 , NO3 , PH Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-JAMES_04 James River	Columbia Road Reservoir to near US HWY 12	R8	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO	ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp, TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-R-JAMES_05 James River	US HWY 12 to Mud Creek	R9	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO	ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-JAMES_06 James River	Mud Creek to James River Diversion Dam	R10	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-JAMES_07 James River	James River Diversion Dam to Huron 3rd Street Dam	R11	Domestic Water Supply Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL FULL	5	TDS	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , Temp TSS
SD-JA-R-JAMES_08 James River	Huron 3rd Street Dam to Sand Creek	R12	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL NON FULL	4A	MeHg MeHg	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-JAMES_09 James River	Sand Creek to I-90	R13	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL	5	TSS	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-JA-R-JAMES_10 James River	I-90 to Yankton County line	R14	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL NON FULL	5	MeHg MeHg	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-JAMES_11 James River	Yankton County line to mouth	R15	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL NON FULL	5	MeHg, TSS MeHg	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , ECOLI, Temp

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-R-MAPLE_01 Maple River	ND border to Elm River	R16	Domestic Water Supply Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL FULL FULL FULL	5	TDS	DO , ECOLI , NH3 , NO3 , PH , SAR , SC , Temp , TSS
SD-JA-R-MOCCASIN_01 Moccasin Creek	S24, T123N, R64W to headwaters	R17	Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NA NA	3		
SD-JA-R-MOCCASIN_02 Moccasin Creek	James River to S24, T123N, R64W	R18	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	PH ECOLI	DO , NH3 , NO3 , SC , TDS , Temp , TSS
SD-JA-R-MUD_01 Mud Creek	James River to Hwy 37	R19	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO	NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-PIERRE_01 Pierre Creek	James River to S11, T102N, R58W	R20	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp
SD-JA-R-SNAKE_01 Snake Creek	James River to confluence with SF Snake Creek	R21	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL INS FULL FULL	2		DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-JA-R-TURTLE_01 Turtle Creek	James River to S17, T113N, R65W	R22	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-JA-R-WOLF_01 Wolf Creek	Wolf Creek Colony to S5, T103N, R56W	R23	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL NON	5	 ECOLI SC	DO , NH3 , NO3 , PH , Sal/SAR , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-JA-R-WOLF_02 Wolf Creek	Just above Wolf Creek Colony to the mouth.	R24	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	INS NON INS INS	4A	ECOLI	
SD-JA-R-WOLF_SP_01 Wolf Creek	Turtle Creek to S10, T114N, R66W	R25	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS

Little Missouri River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-LM-R-LITTLE_MISSOURI_01 Little Missouri River	Montana border to North Dakota border	R1	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON FULL NON FULL	5	MeHg, TSS MeHg	DO , ECOLI , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp

Missouri River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MI-L-ANDES_01	Charles Mix County	L1	Warmwater Marginal Fish Life	NON	5	DO, PH	ALK , NH3 , NO3 , SC , TDS , TSS
Lake Andes			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-BRAKKE_01	Lyman County	L2	Warmwater Permanent Fish Life	NON	5	CHL-A	PH, SC, Temp
Brakke Dam			Immersion Recreation	NON		CHL-A, DO	
			Limited Contact Recreation	NON		CHL-A, DO	
			Fish and Wildlife Prop, Rec, Stock	INS			
SD-MI-L-BURKE_01	Gregory County	L3	Warmwater Semipermanent Fish Life	NON	4A	CHL-A, DO	ALK , ECOLI , MeHG , NH3 , NO3 , PH , SC , TDS TSS
Burke Lake			Immersion Recreation	NON		CHL-A	
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-BYRE_01	Lyman County	L4	Warmwater Permanent Fish Life	NON	5	CHL-A, Temp	ALK, NH3, DO, MeHg, NO3, PH, SC, TDS, TSS
Byre Lake			Immersion Recreation	NON		CHL-A	
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	INS			
SD-MI-L-CAMPBELL_01	Campbell County	L5	Warmwater Semipermanent Fish Life	NON	5	DO, PH	ALK , NH3 , NO3 , SC , TDS , Temp , TSS
Lake Campbell			Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-CORSICA_01	Douglas County	L6	Warmwater Semipermanent Fish Life	NON	5	CHL-A, PH	
Corsica Lake			Immersion Recreation	NON		CHL-A	
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	INS			
SD-MI-L-COTTONWOOD_01	Sully County	L7	Warmwater Semipermanent Fish Life	NON	4A	MeHg	
Cottonwood Lake			Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MI-L-DANTE_01		L8	Warmwater Permanent Fish Life	NON	5	DO, Temp	
Dante Lake	Charles Mix County		Immersion Recreation	NON		DO	
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	INS			
SD-MI-L-EUREKA_01		L9	Warmwater Semipermanent Fish Life	FULL	1		
Eureka Lake	McPherson County		Immersion Recreation	FULL			ALK , DO , NH3 , NO3 , PH SC , TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-FAIRFAX_01		L10	Warmwater Semipermanent Fish Life	FULL	2		
Fairfax Lake	Gregory County		Immersion Recreation	INS			MeHG
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-FATE_01		L11	Warmwater Permanent Fish Life	NON	4A	MeHg	
Fate Dam	Lyman County		Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-MI-L-GEDDES_01		L12	Warmwater Semipermanent Fish Life	NON	4A	CHL-A, DO	
Geddes Lake	Charles Mix County		Immersion Recreation	NON		CHL-A, DO	ALK , NH3 , NO3 , PH , SC TDS , Temp , TSS
			Limited Contact Recreation	NON		CHL-A, DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-HIDDENWOOD_01		L13	Warmwater Semipermanent Fish Life	FULL	2		
Lake Hiddenwood	Walworth County		Immersion Recreation	INS			MeHg
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-MI-L-HURLEY_01		L14	Warmwater Permanent Fish Life	NON	4A	MeHg	
Lake Hurley	Potter County		Immersion Recreation	NA			
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MI-L-KIESZ_01 Kiesz Lake	McPherson County	L15	Fish and Wildlife Prop, Rec, Stock	NON	5	MeHg	
SD-MI-L-MCCOOK_01 McCook Lake	Union County	L16	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL FULL	5	Temp	ALK , CHL-A , DO , NH3 , NO3 , PH , SC , TDS , TSS
SD-MI-L-PLATTE_01 Platte Lake	Charles Mix County	L17	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-MI-L-POCASSE_01 Lake Pocasse	Campbell County	L18	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	CHL-A CHL-A CHL-A	ALK , DO , NH3 , NO3 , PH, SC , TDS , Temp , TSS
SD-MI-L-POTTS_01 Potts Dam	Potter County	L19	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NA NA NON	5	MeHg MeHg	
SD-MI-L-ROOSEVELT_01 Roosevelt Lake	Tripp County	L20	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	DO, MeHg DO DO MeHg	
SD-MI-L-SIMON_01 Simon Lake	Potter County	L21	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg
SD-MI-L-SPRING_01 Spring Lake	Walworth County	L22	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MI-L-SULLY_01 Sully Lake	Sully County	L23	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	CHL-A CHL-A CHL-A	ALK , DO , NH3 , NO3 , PH SC , TDS , Temp , TSS
SD-MI-L-SULLY_DAM_01 Sully Dam	Tripp County	L24	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NA NA NA NA	3		
SD-MI-L-SWAN_01 Swan Lake	Walworth County	L25	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS NA NA INS	3		
SD-MI-L-TWIN_01 Twin Lakes	Stanley County	L26	Fish and Wildlife Prop, Rec, Stock	FULL	1		MeHg
SD-MI-L-YANKTON_01 Lake Yankton	Yankton County	L27	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON INS INS INS	5		
SD-MI-R-CHOTEAU_01 Choteau Creek	Lewis & Clark Lake to S34, T96N, R63W	R1	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
SD-MI-R-CROW_01 Crow Creek	Bedashosha Lake to Jerauld County line	R2	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp, TSS
SD-MI-R-EMANUEL_01 Emanuel Creek	Lewis and Clark Lake to S20, T94N, R60W	R3	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	4A	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MI-R-FRANCIS_CASE_01 Missouri River (Lake Francis Case)	Big Bend Dam to Fort Randall Dam	R4	Domestic Water Supply	FULL	1		DO , ECOLI , MeHG , NO3, PH , Sal/SAR , SC , TDS , Temp , TSS
			Warmwater Permanent Fish Life	FULL			
			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
			Commerce / Industry	FULL			
SD-MI-R-LEWIS_AND_CLARK_01 Missouri River (Lewis and Clark Lake)	Fort Randall Dam to North Sioux City	R5	Domestic Water Supply	FULL	1		DO , ECOLI , MeHG , NH3 NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
			Warmwater Permanent Fish Life	FULL			
			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
			Commerce / Industry	FULL			
SD-MI-R-MEDICINE_01 Medicine Creek	Lake Sharpe to US Hwy 83	R6	Warmwater Marginal Fish Life	FULL	5		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		TDS	
			Irrigation Waters	NON		SC	
SD-MI-R-MEDICINE_KNOLL_01 Medicine Knoll Creek	Lake Sharpe to confluence with its north and south forks	R7	Warmwater Marginal Fish Life	FULL	1		NH3 , NO3 , PH , SC , TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
SD-MI-R-OAHE_01 Missouri River (Lake Oahe)	North Dakota border to Oahe Dam	R8	Domestic Water Supply	FULL	4A		DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp , TSS
			Coldwater Permanent Fish Life	NON		MeHg	
			Immersion Recreation	FULL			
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
			Irrigation Waters	FULL			
			Commerce / Industry	FULL			

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MI-R-OAK_01_USGS	S20, T21N, R28E to Oahe	R9	Warmwater Marginal Fish Life	INS	3		
Oak Creek			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	INS			
			Irrigation Waters	INS			
SD-MI-R-PLATTE_01_USGS	Near Platte, SD	R10	Warmwater Marginal Fish Life	FULL	5		
Platte Creek			Limited Contact Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
SD-MI-R-PONCA_01	SD/NE border to US Hwy 183	R11	Warmwater Semipermanent Fish Life	NON	5	TSS	
Ponca Creek			Limited Contact Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
SD-MI-R-SHARPE_01	Oahe Dam to Big Bend Dam	R12	Domestic Water Supply	FULL	5		
Missouri River (Lake Sharpe)			Coldwater Permanent Fish Life	NON		Temp	
			Immersion Recreation	FULL			DO , ECOLI , NH3 , NO3 , PH , Sal/SAR , SC , TDS , MeHg, TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
			Commerce / Industry	FULL			
SD-MI-R-SPRING_01	Lake Pocasse to US HWY 83	R13	Warmwater Semipermanent Fish Life	NON	5	DO	ECOLI , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp TSS
Spring Creek			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			

Minnesota River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MN-L-ALICE_01 Lake Alice	Deuel County	L1	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON FULL FULL NON	4A	MeHg MeHg	ALK, NH3, CHL-A, DO, ECOLI, NO3, PH, SC Temp, TDS, TSS
SD-MN-L-BIG_STONE_01 Big Stone Lake	Roberts County	L2	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		ALK , DO , ECOLI , NH3 , NO3 , PH SC , Temp , TDS , TSS
SD-MN-L-COCHRANE_01 Lake Cochrane	Deuel County	L3	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , TSS
SD-MN-L-DRYWOOD_NORTH_01 Lake Drywood North	Roberts County (formerly SD-BS-L-DRYWOOD_NORTH_01)	L4	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-MN-L-FISH_01 Fish Lake	Deuel County	L5	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON NON	5	PH, CHL-A ECOLI, CHL-A ECOLI, CHL-A PH	ALK , DO , NH3 , NO3 , SC , TDS , Temp , TSS
SD-MN-L-HENDRICKS_01 Lake Hendricks	Brookings County	L6	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A , DO , ECOLI NH3 , NO3 , PH , SC , TDS Temp , TSS
SD-MN-L-OAK_01 Oak Lake	Brookings County	L7	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	3	CHL-A E.COLI E.COLI	ALK, NH3, DO, NO3, PH, SC, Temp, TDS, TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MN-L-OLIVER_01 Lake Oliver	Deuel County	L8	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , CHL-A , DO , ECOLI, NH3 , NO3 , PH , SC , TDS, Temp , TSS
SD-MN-L-PUNISHED_WOMAN_01 Punished Woman Lake	Codington County	L9	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-L-SUMMIT_01 Summit Lake	Grant County	L10	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON INS INS NON	4A	MeHg MeHg	DO, PH, SC, Temp
SD-MN-L-TURTLE_FOOT_01 Turtle Foot Lake	Marshall County	L11	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	INS INS INS INS	3		
SD-MN-R-LAC_QUI_PARLE_W_BR_01 Lac Qui Parle River, West Branch	SD/MN border to S8, T115N, R47W	R1	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	 ECOLI 	 DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-R-LITTLE_MINNESOTA_01 Little Minnesota River	Big Stone Lake to S24, T126N, R51W	R2	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-R-LITTLE_MINNESOTA_02 Little Minnesota River	S24, T126N, R51W to S15, T128N, R52W	R3	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	DO DO 	NH3 , NO3 , PH , SC , TDS Temp , TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MN-R-MUD_01 Mud Creek	SF Yellowbank River to S22, T118N, R48W	R4	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	ALK , DO , NH3 , NO3 , PH SC , TDS , Temp , TSS
SD-MN-R-WHETSTONE_01 Whetstone River	SD/MN border to confluence with its north and south forks	R5	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-R-WHETSTONE_N_FORK_01 North Fork Whetstone River	SD Hwy 15 to Whetstone River	R6	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , NH3 , NO3 , PH , SC , ECOLI, TDS , Temp , TSS
SD-MN-R-WHETSTONE_S_FORK_01 South Fork Whetstone River	Headwaters to Lake Farley	R7	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-R-WHETSTONE_S_FORK_02 South Fork Whetstone River	Lake Farley to mouth	R8	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-R-YELLOW_BANK_N_FORK_01 North Fork Yellow Bank River	SD/MN border to S27, T120N, R48W	R9	Warmwater Permanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	4A	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS
SD-MN-R-YELLOW_BANK_S_FORK_01 South Fork Yellow Bank River	SD/MN border to S33, T118N, R49W	R10	Coldwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	4A	ECOLI	DO , NH3 , NO3 , PH , SC TDS , Temp , TSS

Moreau River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-MU-L-COAL_SPRINGS_01	Perkins County	L1	Warmwater Permanent Fish Life	NON	5	MeHg, PH	
Coal Springs Reservoir			Immersion Recreation	INS			ALK , SC , TDS , Temp , TSS
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg, PH	
SD-MU-L-LITTLE_MOREAU_NO1_01	Dewey County	L2	Warmwater Permanent Fish Life	NON	5	MeHg, PH	
Little Moreau No. 1			Immersion Recreation	FULL			ALK , DO , NH3 , NO3 , SC TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg, PH	
SD-MU-R-MOREAU_01	North and South Forks to Ziebach/Perkins county line	R1	Warmwater Semipermanent Fish Life	NON	5	TSS	
Moreau River			Limited Contact Recreation	FULL			As , DO , NH3 , NO3 , PH , ECOLI, Ra , SC , TDS , Temp, U
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-MU-R-MOREAU_02	Ziebach/Perkins county line to Green Grass	R2	Warmwater Semipermanent Fish Life	FULL	5		
Moreau River			Limited Contact Recreation	FULL			DO , ECOLI , NH3 , NO3 , PH , SC , TDS , Temp, TSS
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-MU-R-MOREAU_03	Green Grass to mouth	R3	Warmwater Semipermanent Fish Life	NON	5	TSS	
Moreau River			Limited Contact Recreation	FULL			DO , NH3 , NO3 , PH , SC , ECOLI, TDS , Temp
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	NON		Sal/SAR	
SD-MU-R-MOREAU_S_FORK_01	Alkali Creek to mouth	R4	Warmwater Marginal Fish Life	FULL	5		
South Fork Moreau River			Limited Contact Recreation	FULL			DO , ECOLI , NH3 , NO3 , PH , Temp , TSS
			Fish and Wildlife Prop, Rec, Stock	NON		SC, TDS	
			Irrigation Waters	NON		Sal/SAR, SC	
SD-MU-R-RABBIT_01	Antelope Creek to Moreau River	R5	Warmwater Marginal Fish Life	NON	5	TSS	
Rabbit Creek			Limited Contact Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			

Niobrara River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-NI-L-DOG_EAR_01 Dog Ear Lake	Tripp County	L1	Warmwater Semipermanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL NA NA FULL	2		MeHg
SD-NI-L-RAHN_01 Rahn Lake	Tripp County	L2	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	5	CHL-A, DO CHL-A, DO CHL-A, DO	ALK , NH3 , NO3 , PH , Temp , TSS
SD-NI-R-KEYA_PAHA_01 Keya Paha River	SD/NE border to confluence with Antelope Creek	R1	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	4A	TSS ECOLI	DO , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp

Red River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-RD-L-TRAVERSE_01 Lake Traverse	Roberts County	L1	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL FULL	1		ALK, NH3, CHL-A, DO, E.COLI, NO3, PH, SC, Temp, TDS, TSS
SD-RD-L-WHITE_01 White Lake	Marshall County	L2	Warmwater Permanent Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	NON NON NON FULL	4A	CHL-A CHL-A CHL-A	ALK , DO , ECOLI , NH3 , NO3 , PH SC , TDS , Temp , TSS

Vermillion River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-VM-L-E_VERMILLION_01		L1	Warmwater Permanent Fish Life	NON	5	CHL-A, MeHg,	
East Vermillion Lake	McCook County		Immersion Recreation	NON		CHL-A	ALK, NH3, DO, E.COLI,
			Limited Contact Recreation	NON		CHL-A	NO3, PH, SC, Temp,
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	TDS, TSS
SD-VM-L-HENRY_01		L2	Warmwater Marginal Fish Life	NON	5	MeHg, PH	
Lake Henry	Kingsbury County		Immersion Recreation	FULL			ALK , NH3 , ECOLI , NO3 , SC , TDS , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-VM-L-MARINDAHL_01		L3	Warmwater Permanent Fish Life	NON	5	Temp	
Marindahl Lake	Yankton County		Immersion Recreation	NON		DO	ALK, NH3, E.coli, MeHG, NO3, PH, SC, Temp, TDS, TSS
			Limited Contact Recreation	NON		DO	
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-VM-L-SILVER_01		L4	Warmwater Marginal Fish Life	NON	5	PH	
Silver Lake	Hutchinson County		Immersion Recreation	INS			
			Limited Contact Recreation	INS			
			Fish and Wildlife Prop, Rec, Stock	INS			
SD-VM-L-SPIRIT_01		L5	Warmwater Marginal Fish Life	NON	5	MeHg	
	Kingsbury County		Immersion Recreation	NA			
Spirit Lake			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	
SD-VM-L-SWAN_01		L6	Warmwater Semipermanent Fish Life	FULL	1		
Swan Lake	Turner County		Immersion Recreation	FULL			ALK, NH3, DO, E.COLI,
			Limited Contact Recreation	FULL			NO3, PH, SC, Temp,
			Fish and Wildlife Prop, Rec, Stock	FULL			TDS, TSS
SD-VM-L-THOMPSON_01		L7	Warmwater Permanent Fish Life	NON	5	CHL-A, MeHg	
Lake Thompson	Kingsbury County		Immersion Recreation	NON		CHL-A	ALK , DO , ECOLI , NH3 , NO3 , PH SC , TDS , Temp , TSS
			Limited Contact Recreation	NON		CHL-A	
			Fish and Wildlife Prop, Rec, Stock	NON		MeHg	

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-VM-L-WHITEWOOD_01 Whitewood Lake	Kingsbury County	L8	Warmwater Marginal Fish Life Immersion Recreation Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock	FULL FULL FULL FULL	1		ALK , DO , ECOLI , NH3 , NO3 , MeHg , PH , SC , TDS , Temp , TSS
SD-VM-R-LONG_01 Long Creek	Vermillion River to Highway 44	R1	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp
SD-VM-R-VERMILLION_01 Vermillion River	Headwaters to Turkey Ridge Creek	R2	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-VM-R-VERMILLION_02 Vermillion River	Turkey Ridge Creek to Baptist Creek	R3	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-VM-R-VERMILLION_03 Vermillion River	Baptist Creek to mouth	R4	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	NON NON FULL FULL	5	TSS ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
SD-VM-R-VERMILLION_E_FORK_01 East Fork Vermillion River	McCook/Lake County line to Little Vermillion River	R5	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	4A	ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp TSS
SD-VM-R-VERMILLION_E_FORK_02 East Fork Vermillion River	Little Vermillion River to mouth	R6	Warmwater Marginal Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL FULL FULL FULL	1		DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp TSS

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-VM-R-VERMILLION_WEST_FORK_01_USGS West Fork Vermillion River	Vermillion River to McCook-Miner County Line	R7	Warmwater Marginal Fish Life	FULL	4A		
			Limited Contact Recreation	NON		ECOLI	TSS
			Fish and Wildlife Prop, Rec, Stock	INS			
			Irrigation Waters	INS			

White River Basin

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-WH-L-ALLAN_DAM_01 Allan Dam	Bennett County	L1	Coldwater Marginal Fish Life	NON	5	PH	
			Immersion Recreation	FULL			ALK , DO , NH3 , NO3 , SC TDS , Temp , TSS
			Limited Contact Recreation	FULL			
			Fish and Wildlife Prop, Rec, Stock	FULL			
SD-WH-R-BLACKPIPE_01_USGS Black Pipe Creek	S25, T42N, R33W to White River	R1	Warmwater Marginal Fish Life	INS	3		
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	INS			
			Irrigation Waters	INS			
SD-WH-R-COTTONWOOD_01 Cottonwood Creek	Headwaters to White River	R2	Fish and Wildlife Prop, Rec, Stock	INS	5		
			Irrigation Waters	NON		SC	
SD-WH-R-LITTLE_WHITE_01 Little White River	Rosebud Creek to mouth	R3	Warmwater Semipermanent Fish Life	FULL	5		
			Limited Contact Recreation	NON		ECOLI	DO , NH3 , NO3 , PH , Sal/SAR , SC , TDS , Temp
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			
SD-WH-R-LITTLE_WHITE_02_USGS Little White River	S6, T36N, R39W to Rosebud Creek	R4	Warmwater Semipermanent Fish Life	FULL	2		MeHg
			Limited Contact Recreation	NA			
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	INS			
SD-WH-R-WHITE_01 White River	NE/SD border to Willow Creek	R5	Warmwater Semipermanent Fish Life	FULL	1		
			Limited Contact Recreation	FULL			As , DO , NH3 , NO3 , PH , Ra , Sal/SAR , SC , TDS , Temp , TSS, U
			Fish and Wildlife Prop, Rec, Stock	FULL			
			Irrigation Waters	FULL			

Waterbody / AU-ID	Location	Map ID	Use	Support	EPA Category	Nonsupporting Parameters:	Supporting Parameters:
SD-WH-R-WHITE_02 White River	Willow Creek to Pass Creek	R6	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp TSS
SD-WH-R-WHITE_03 White River	Pass Creek to Little White River	R7	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , SC , TDS , Temp , TSS, Sal/SAR
SD-WH-R-WHITE_04 White River	Little White River to confluence with Missouri River	R8	Warmwater Semipermanent Fish Life Limited Contact Recreation Fish and Wildlife Prop, Rec, Stock Irrigation Waters	FULL NON FULL FULL	5	ECOLI	DO , NH3 , NO3 , PH , Sal/SAR, SC , TDS , Temp TSS

APPENDIX D

303(D) SUMMARY

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-BA-L-COOKSTOVE_01	Cookstove Lake	MERCURY IN FISH TISSUE	2022	2025	High
SD-BA-L-FREEMAN_01	Freeman Lake	CHLOROPHYLL-A	2014	2035	Low
SD-BA-L-FREEMAN_01	Freeman Lake	DISSOLVED OXYGEN	2010	2035	Low
SD-BA-L-HAYES_01	Hayes Lake	DISSOLVED OXYGEN	2020	2035	Low
SD-BA-L-MURDO_01	Murdo Dam	DISSOLVED OXYGEN	2012	2035	Low
SD-BA-L-WAGGONER_01	Waggoner Lake	CHLOROPHYLL-A	2010	2027	High
SD-BA-R-BAD_01	Bad River	ESCHERICHIA COLI	2016	2030	High
SD-BA-R-BAD_01	Bad River	SPECIFIC CONDUCTIVITY	2022	2034	Low
SD-BF-L-IRON_CREEK_01	Iron Creek Lake	TEMPERATURE	2010	2035	Low
SD-BF-L-MIRROR_EAST_01	Mirror Lake East	TEMPERATURE	2006	2035	Low
SD-BF-L-MIRROR_WEST_01	Mirror Lake West	TEMPERATURE	2008	2035	Low
SD-BF-L-NEWELL_CITY_01	Newell City Pond	TEMPERATURE	2010	2035	Low
SD-BF-R-BELLE_FOURCHE_02	Belle Fourche River	ESCHERICHIA COLI	2020	2026	High
SD-BF-R-BELLE_FOURCHE_03	Belle Fourche River	ESCHERICHIA COLI	2016	2026	High
SD-BF-R-BELLE_FOURCHE_04	Belle Fourche River	ESCHERICHIA COLI	2020	2026	High
SD-BF-R-ELM_01	Elm Creek	ESCHERICHIA COLI	2022	2028	High
SD-BF-R-ELM_01	Elm Creek	SPECIFIC CONDUCTIVITY	2022	2035	Low
SD-BF-R-ELM_01	Elm Creek	TOTAL SUSPENDED SOLIDS	2022	2028	High
SD-BF-R-FALSE_BOTTOM_02	False Bottom Creek	SELENIUM, TOTAL	2022	2035	Low
SD-BF-R-WHITEWOOD_04	Whitewood Creek	ESCHERICHIA COLI	2012	2022	High
SD-BF-R-WHITEWOOD_05	Whitewood Creek	PH	2006	2035	Low
SD-BF-R-WHITEWOOD_06	Whitewood Creek	PH	2008	2035	Low
SD-BS-L-ALBERT_01	Lake Albert	CHLOROPHYLL-A	2020	2028	High
SD-BS-L-ALVIN_01	Lake Alvin	TEMPERATURE	2022	2035	Low
SD-BS-L-BITTER_01	Bitter Lake	CHLOROPHYLL-A	2022	2035	Low
SD-BS-L-CAMPBELL_01	Lake Campbell	CHLOROPHYLL-A	2022	2030	Low
SD-BS-L-CLEAR_D_01	Clear Lake	ESCHERICHIA COLI	2022	2035	Low

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-BS-L-COVELL_01	Covell Lake	CHLOROPHYLL-A	2022	2035	Low
SD-BS-L-COVELL_01	Covell Lake	PH	2022	2035	Low
SD-BS-L-COVELL_01	Covell Lake	TEMPERATURE	2022	2035	Low
SD-BS-L-GOLDSMITH_01	Goldsmith Lake	CHLOROPHYLL-A	2022	2035	Low
SD-BS-L-MINNEWASTA_01	Minnewasta Lake	CHLOROPHYLL-A	2014	2035	Low
SD-BS-L-NORDEN_01	Lake Norden	DISSOLVED OXYGEN	2022	2035	Low
SD-BS-L-POINSETT_01	Lake Poinsett	ESCHERICHIA COLI	2022	2035	Low
SD-BS-L-SCHOOL_01	School Lake	PH	2022	2035	Low
SD-BS-L-SCOTT_01	Scott Lake	MERCURY IN FISH TISSUE	2020	2025	High
SD-BS-L-TWIN_01	Twin Lakes/W. Hwy 81	ESCHERICHIA COLI	2022	2035	Low
SD-BS-L-WALL_01	Wall Lake	DISSOLVED OXYGEN	2022	2035	Low
SD-BS-L-WAUBAY_01	Waubay Lake	CHLOROPHYLL-A	2014	2027	Low
SD-BS-R-BACHELOR_01	Bachelor Creek	DISSOLVED OXYGEN	2022	2035	Low
SD-BS-R-BACHELOR_01	Bachelor Creek	ESCHERICHIA COLI	2020	2028	High
SD-BS-R-BEAVER_01	Beaver Creek	ESCHERICHIA COLI	2020	2028	High
SD-BS-R-BIG_SIOUX_01	Big Sioux River	DISSOLVED OXYGEN	2004	2035	Low
SD-BS-R-BIG_SIOUX_04	Big Sioux River	DISSOLVED OXYGEN	2020	2035	Low
SD-BS-R-BIG_SIOUX_04	Big Sioux River	TOTAL SUSPENDED SOLIDS	2022	2030	High
SD-BS-R-BIG_SIOUX_05	Big Sioux River	TOTAL SUSPENDED SOLIDS	2004	2022	High
SD-BS-R-BIG_SIOUX_06	Big Sioux River	TOTAL SUSPENDED SOLIDS	2004	2022	High
SD-BS-R-BIG_SIOUX_10	Big Sioux River	TOTAL DISSOLVED SOLIDS	2022	2035	Low
SD-BS-R-BIG_SIOUX_13	Big Sioux River	ESCHERICHIA COLI	2012	2026	High
SD-BS-R-BIG_SIOUX_13	Big Sioux River	TOTAL SUSPENDED SOLIDS	2004	2026	High
SD-BS-R-BIG_SIOUX_14	Big Sioux River	TOTAL SUSPENDED SOLIDS	2004	2026	High
SD-BS-R-BRULE_01	Brule Creek	TOTAL SUSPENDED SOLIDS	2018	2022	High
SD-BS-R-EAST_BRULE_01	East Brule Creek	ESCHERICHIA COLI	2020	2026	High
SD-BS-R-EAST_BRULE_01	East Brule Creek	TOTAL SUSPENDED SOLIDS	2008	2026	High

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-BS-R-FLANDREAU_01	Flandreau Creek	ESCHERICHIA COLI	2014	2028	High
SD-BS-R-HIDEWOOD_01	Hidewood Creek	ESCHERICHIA COLI	2020	2028	High
SD-BS-R-MEDARY_01	Medary Creek	ESCHERICHIA COLI	2020	2028	High
SD-BS-R-PEG_MUNKY_RUN_01	Peg Munky Run	ESCHERICHIA COLI	2022	2031	High
SD-BS-R-PIPESTONE_01	Pipestone Creek	TOTAL SUSPENDED SOLIDS	2020	2028	High
SD-BS-R-SIXMILE_01	Six Mile Creek	DISSOLVED OXYGEN	2020	2035	Low
SD-BS-R-SIXMILE_01	Six Mile Creek	ESCHERICHIA COLI	2014	2022	High
SD-BS-R-SKUNK_01	Skunk Creek	ESCHERICHIA COLI	2014	2022	High
SD-BS-R-SPLIT_ROCK_01_USGS	Split Rock Creek	ESCHERICHIA COLI	2018	2025	High
SD-BS-R-SPLIT_ROCK_02	Split Rock Creek	ESCHERICHIA COLI	2022	2025	High
SD-BS-R-SPRING_01	Spring Creek	ESCHERICHIA COLI	2022	2030	High
SD-BS-R-SPRING_01	Spring Creek	TOTAL SUSPENDED SOLIDS	2022	2030	High
SD-BS-R-UNION_01	Union Creek	ESCHERICHIA COLI	2022	2029	High
SD-BS-R-UNION_01	Union Creek	TOTAL SUSPENDED SOLIDS	2008	2024	High
SD-BS-R-WILLOW_01	Willow Creek	DISSOLVED OXYGEN	2022	2035	Low
SD-BS-R-WILLOW_01	Willow Creek	ESCHERICHIA COLI	2018	2028	High
SD-CH-L-CENTER_01	Center Lake	TEMPERATURE	2008	2035	Low
SD-CH-L-COLD_BROOK_01	Cold Brook Reservoir	TEMPERATURE	2006	2035	Low
SD-CH-L-DEERFIELD_01	Deerfield Lake	TEMPERATURE	2010	2035	Low
SD-CH-L-DURKEE_01	Durkee Lake	MERCURY IN FISH TISSUE	2020	2022	High
SD-CH-L-DURKEE_01	Durkee Lake	PH	2022	2035	Low
SD-CH-L-HORSETHIEF_01	Horsethief Lake	PH	2022	2035	Low
SD-CH-L-HORSETHIEF_01	Horsethief Lake	TEMPERATURE	2022	2035	Low
SD-CH-L-NEW_WALL_01	New Wall Lake	DISSOLVED OXYGEN	2022	2035	Low
SD-CH-L-NEW_WALL_01	New Wall Lake	MERCURY IN FISH TISSUE	2018	2022	High
SD-CH-L-PACTOLA_01	Pactola Reservoir	TEMPERATURE	2020	2035	Low
SD-CH-L-SHERIDAN_01	Sheridan Lake	TEMPERATURE	2006	2035	Low

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-CH-L-SYLVAN_01	Sylvan Lake	TEMPERATURE	2008	2035	Low
SD-CH-R-BEAVER_01	Beaver Creek	SPECIFIC CONDUCTIVITY	2004	2035	Low
SD-CH-R-CHEYENNE_01	Cheyenne River	Salinity/SAR	2018	2035	Low
SD-CH-R-CHEYENNE_01	Cheyenne River	SPECIFIC CONDUCTIVITY	2004	2035	Low
SD-CH-R-CHEYENNE_01	Cheyenne River	TOTAL DISSOLVED SOLIDS	2004	2035	Low
SD-CH-R-CHEYENNE_01	Cheyenne River	TOTAL SUSPENDED SOLIDS	2012	2026	High
SD-CH-R-CHEYENNE_02	Cheyenne River	ESCHERICHIA COLI	2014	2028	High
SD-CH-R-CHEYENNE_02	Cheyenne River	SPECIFIC CONDUCTIVITY	2004	2035	Low
SD-CH-R-CHEYENNE_02	Cheyenne River	TOTAL SUSPENDED SOLIDS	2004	2028	High
SD-CH-R-CHEYENNE_02B	Cheyenne River	TOTAL SUSPENDED SOLIDS	2018	2028	High
SD-CH-R-CHEYENNE_03	Cheyenne River	TOTAL SUSPENDED SOLIDS	2004	2028	High
SD-CH-R-CHEYENNE_04	Cheyenne River	TOTAL SUSPENDED SOLIDS	2004	2028	High
SD-CH-R-CHEYENNE_05	Cheyenne River	TOTAL SUSPENDED SOLIDS	2004	2028	High
SD-CH-R-CHEYENNE_06	Cheyenne River	TOTAL SUSPENDED SOLIDS	2004	2028	High
SD-CH-R-ELK_01_USGS	Elk Creek	ESCHERICHIA COLI	2018	2028	High
SD-CH-R-HIGHLAND_01_USGS	Highland Creek	PH	2006	2035	Low
SD-CH-R-HIGHLAND_01_USGS	Highland Creek	TEMPERATURE	2006	2035	Low
SD-CH-R-HORSEHEAD_01_USGS	Horsehead Creek	SPECIFIC CONDUCTIVITY	2004	2035	Low
SD-CH-R-RAPID_03	Rapid Creek	ESCHERICHIA COLI	2018	2024	High
SD-CH-R-SPRING_01	Spring Creek	ESCHERICHIA COLI	2014	2022	High
SD-CH-R-VICTORIA_01_USGS	Victoria Creek	TEMPERATURE	2016	2035	Low
SD-GR-L-EAST_LEMMON_01	East Lemmon Lake	MERCURY IN FISH TISSUE	2018	2022	High
SD-GR-L-ISABEL_01	Lake Isabel	CHLOROPHYLL-A	2010	2035	Low
SD-GR-L-ISABEL_01	Lake Isabel	MERCURY IN FISH TISSUE	2016	2030	High
SD-GR-L-PUDWELL_01	Pudwell Dam	MERCURY IN FISH TISSUE	2016	2030	High
SD-GR-L-SHADEHILL_01	Shadehill Reservoir	Salinity/SAR	2004	2035	Low
SD-GR-R-BULL_01	Bull Creek	Salinity/SAR	2012	2035	Low

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-GR-R-CROOKED_01	Crooked Creek	Salinity/SAR	2012	2035	Low
SD-GR-R-CROOKED_01	Crooked Creek	SPECIFIC CONDUCTIVITY	2014	2035	Low
SD-GR-R-CROOKED_01	Crooked Creek	TOTAL DISSOLVED SOLIDS	2022	2035	Low
SD-GR-R-GRAND_01	Grand River	Salinity/SAR	2016	2035	Low
SD-GR-R-GRAND_02	Grand River	Salinity/SAR	2004	2035	Low
SD-GR-R-GRAND_02	Grand River	TOTAL SUSPENDED SOLIDS	2004	2035	Low
SD-GR-R-GRAND_03	Grand River	Salinity/SAR	2020	2035	Low
SD-GR-R-GRAND_03	Grand River	TOTAL SUSPENDED SOLIDS	2004	2035	Low
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	ESCHERICHIA COLI	2022	2030	High
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	Salinity/SAR	2004	2035	Low
SD-GR-R-GRAND_N_FORK_01	Grand River, North Fork	SPECIFIC CONDUCTIVITY	2018	2035	Low
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	ESCHERICHIA COLI	2016	2030	High
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	Salinity/SAR	2006	2035	Low
SD-GR-R-GRAND_S_FORK_01	Grand River, South Fork	TOTAL SUSPENDED SOLIDS	2004	2030	High
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	ESCHERICHIA COLI	2016	2030	High
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	Salinity/SAR	2004	2035	Low
SD-GR-R-GRAND_S_FORK_02	Grand River, South Fork	TOTAL SUSPENDED SOLIDS	2004	2030	High
SD-JA-L-BEAVER_01	Beaver Lake	DISSOLVED OXYGEN	2022	2035	Low
SD-JA-L-BIERMAN_01	Bierman Dam	CHLOROPHYLL-A	2010	2028	Low
SD-JA-L-CARTHAGE_01	Lake Carthage	CHLOROPHYLL-A	2010	2035	Low
SD-JA-L-CLEAR_M_01	Clear Lake	MERCURY IN FISH TISSUE	2020	2022	High
SD-JA-L-COTTONWOOD_M_01	Cottonwood Lake	PH	2020	2035	Low
SD-JA-L-CRESBARD_01	Cresbard Lake	PH	2010	2035	Low
SD-JA-L-ELM_01	Elm Lake	DISSOLVED OXYGEN	2022	2035	Low
SD-JA-L-FAULKTON_01	Lake Faulkton	DISSOLVED OXYGEN	2018	2035	Low
SD-JA-L-FAULKTON_01	Lake Faulkton	PH	2022	2035	Low
SD-JA-L-HENRY_01	Henry Reservoir	DISSOLVED OXYGEN	2020	2035	Low

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-JA-L-JONES_01	Jones Lake	PH	2006	2035	Low
SD-JA-L-LATHAM_01	Latham	DISSOLVED OXYGEN	2012	2035	Low
SD-JA-L-LOUISE_01	Lake Louise	DISSOLVED OXYGEN	2014	2035	Low
SD-JA-L-N_BUFFALO_01	North Buffalo Lake	MERCURY IN FISH TISSUE	2020	2026	High
SD-JA-L-NINE_MILE_01	Nine Mile Lake	PH	2010	2035	Low
SD-JA-L-PIERPONT_01	Pierpont Lake	TEMPERATURE	2012	2035	Low
SD-JA-L-PIYAS_01	Piyas Lake	MERCURY IN FISH TISSUE	2020	2026	High
SD-JA-L-RAVINE_01	Ravine Lake	CHLOROPHYLL-A	2022	2035	Low
SD-JA-L-RAVINE_01	Ravine Lake	DISSOLVED OXYGEN	2012	2035	Low
SD-JA-L-RAVINE_01	Ravine Lake	PH	2022	2035	Low
SD-JA-L-REDFIELD_01	Lake Redfield	DISSOLVED OXYGEN	2010	2035	Low
SD-JA-L-ROSETTE_01	Rosette Lake	CHLOROPHYLL-A	2014	2028	Low
SD-JA-L-STINK_01	Stink Lake	MERCURY IN FISH TISSUE	2020	2022	High
SD-JA-L-TWIN_01	Twin Lakes	CHLOROPHYLL-A	2010	2026	High
SD-JA-L-TWIN_01	Twin Lakes	DISSOLVED OXYGEN	2016	2035	Low
SD-JA-L-WILMARTH_01	Wilmarth Lake	PH	2012	2035	Low
SD-JA-R-ELM_01	Elm River	TOTAL DISSOLVED SOLIDS	2022	2035	Low
SD-JA-R-FIRESTEEL_01	Firesteel Creek	DISSOLVED OXYGEN	2022	2035	Low
SD-JA-R-FIRESTEEL_01	Firesteel Creek	ESCHERICHIA COLI	2010	2030	High
SD-JA-R-FIRESTEEL_01	Firesteel Creek	TEMPERATURE	2004	2035	Low
SD-JA-R-FIRESTEEL_01	Firesteel Creek	TOTAL DISSOLVED SOLIDS	2004	2035	Low
SD-JA-R-FIRESTEEL_01	Firesteel Creek	TOTAL SUSPENDED SOLIDS	2018	2028	High
SD-JA-R-FOOT_01_USGS	Foot Creek	DISSOLVED OXYGEN	2012	2035	Low
SD-JA-R-JAMES_03	James River	DISSOLVED OXYGEN	2022	2035	Low
SD-JA-R-JAMES_04	James River	DISSOLVED OXYGEN	2012	2035	Low
SD-JA-R-JAMES_05	James River	DISSOLVED OXYGEN	2020	2035	Low
SD-JA-R-JAMES_07	James River	TOTAL DISSOLVED SOLIDS	2022	2035	Low

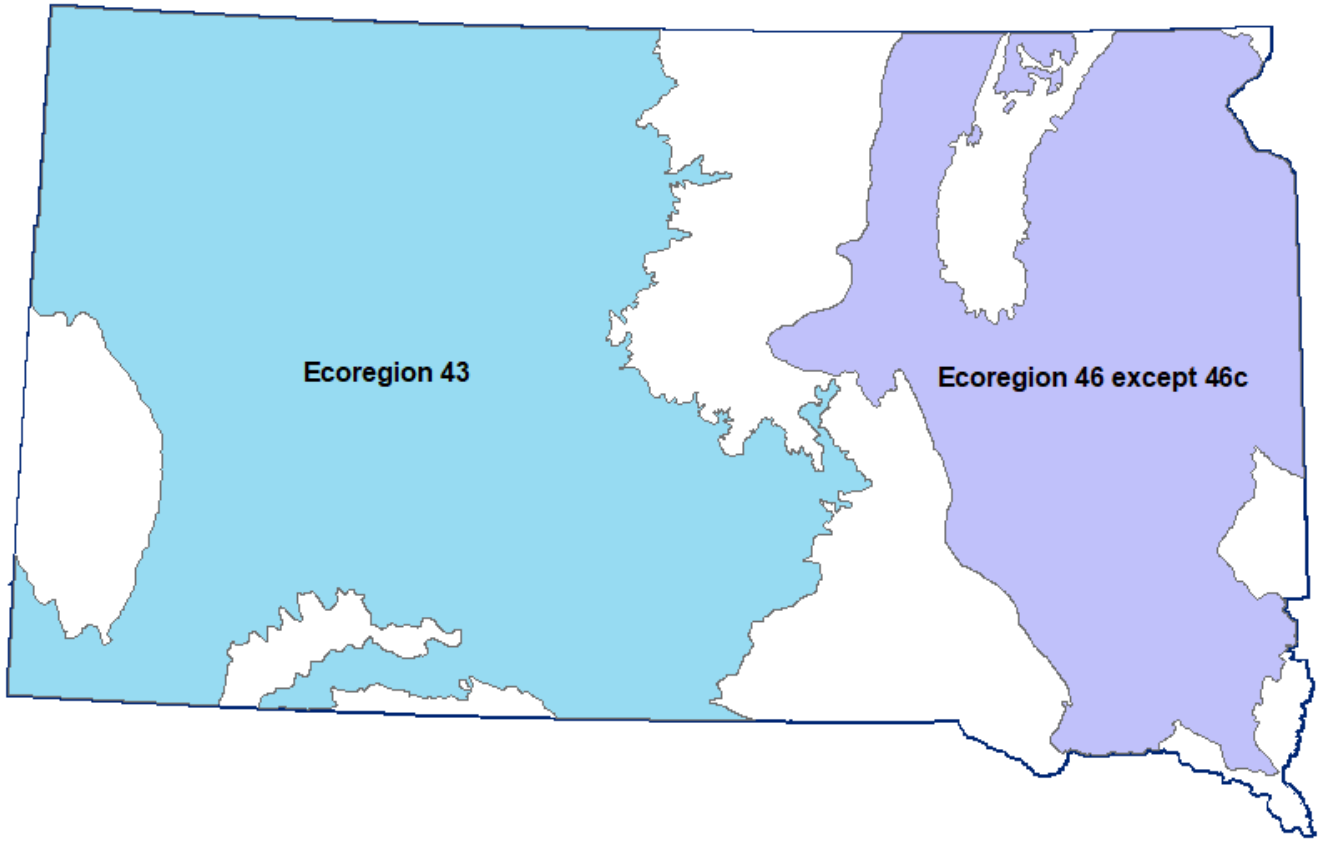
AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-JA-R-JAMES_09	James River	TOTAL SUSPENDED SOLIDS	2022	2030	High
SD-JA-R-JAMES_10	James River	MERCURY IN FISH TISSUE	2020	2026	High
SD-JA-R-JAMES_11	James River	MERCURY IN FISH TISSUE	2020	2026	High
SD-JA-R-JAMES_11	James River	TOTAL SUSPENDED SOLIDS	2004	2022	High
SD-JA-R-MAPLE_01	Maple River	TOTAL DISSOLVED SOLIDS	2020	2035	Low
SD-JA-R-MOCCASIN_02	Moccasin Creek	ESCHERICHIA COLI	2018	2030	High
SD-JA-R-MOCCASIN_02	Moccasin Creek	PH	2022	2035	Low
SD-JA-R-MUD_01	Mud Creek	DISSOLVED OXYGEN	2006	2035	Low
SD-JA-R-PIERRE_01	Pierre Creek	TOTAL SUSPENDED SOLIDS	2022	2028	High
SD-JA-R-WOLF_01	Wolf Creek	SPECIFIC CONDUCTIVITY	2022	2035	Low
SD-LM-R-LITTLE_MISSOURI_01	Little Missouri River	TOTAL SUSPENDED SOLIDS	2010	2025	High
SD-MI-L-ANDES_01	Lake Andes	DISSOLVED OXYGEN	2006	2035	Low
SD-MI-L-ANDES_01	Lake Andes	PH	2018	2035	Low
SD-MI-L-BRAKKE_01	Brakke Dam	DISSOLVED OXYGEN	2022	2035	Low
SD-MI-L-BYRE_01	Byre Lake	TEMPERATURE	2022	2035	Low
SD-MI-L-CAMPBELL_01	Lake Campbell	DISSOLVED OXYGEN	2020	2035	Low
SD-MI-L-CAMPBELL_01	Lake Campbell	PH	2010	2035	Low
SD-MI-L-CORSICA_01	Corsica Lake	PH	2008	2035	Low
SD-MI-L-DANTE_01	Dante Lake	TEMPERATURE	2014	2035	Low
SD-MI-L-KIESZ_01	Kiesz Lake	MERCURY IN FISH TISSUE	2022	2026	High
SD-MI-L-MCCOOK_01	McCook Lake	TEMPERATURE	2010	2035	Low
SD-MI-L-POCASSE_01	Lake Pocasse	CHLOROPHYLL-A	2010	2026	High
SD-MI-L-POTTS_01	Potts Dam	MERCURY IN FISH TISSUE	2020	2022	High
SD-MI-L-ROOSEVELT_01	Roosevelt Lake	DISSOLVED OXYGEN	2018	2035	Low
SD-MI-L-SULLY_01	Sully Lake	CHLOROPHYLL-A	2020	2026	High
SD-MI-L-YANKTON_01	Lake Yankton	TEMPERATURE	2022	2035	Low
SD-MI-R-CROW_01	Crow Creek	ESCHERICHIA COLI	2016	2028	High

AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-MI-R-MEDICINE_01	Medicine Creek	SPECIFIC CONDUCTIVITY	2004	2035	Low
SD-MI-R-MEDICINE_01	Medicine Creek	TOTAL DISSOLVED SOLIDS	2018	2035	Low
SD-MI-R-PLATTE_01_USGS	Platte Creek	ESCHERICHIA COLI	2020	2026	High
SD-MI-R-PONCA_01	Ponca Creek	ESCHERICHIA COLI	2016	2026	High
SD-MI-R-SHARPE_01	Missouri River (Lake Sharpe)	TEMPERATURE	2010	2035	Low
SD-MI-R-SPRING_01	Spring Creek	DISSOLVED OXYGEN	2006	2035	Low
SD-MN-L-FISH_01	Fish Lake	ESCHERICHIA COLI	2022	2035	Low
SD-MN-L-FISH_01	Fish Lake	PH	2022	2035	Low
SD-MN-L-OAK_01	Oak Lake	CHLOROPHYLL-A	2022	2035	Low
SD-MN-L-OAK_01	Oak Lake	ESCHERICHIA COLI	2022	2035	Low
SD-MN-R-LAC_QUI_PARLE_W_BR_01	Lac Qui Parle River, West Branch	ESCHERICHIA COLI	2022	2030	High
SD-MN-R-LITTLE_MINNESOTA_02	Little Minnesota River	DISSOLVED OXYGEN	2020	2035	Low
SD-MN-R-MUD_01	Mud Creek	ESCHERICHIA COLI	2020	2026	High
SD-MN-R-WHETSTONE_S_FORK_01	South Fork Whetstone River	ESCHERICHIA COLI	2012	2022	High
SD-MN-R-WHETSTONE_S_FORK_02	South Fork Whetstone River	ESCHERICHIA COLI	2012	2022	High
SD-MU-L-COAL_SPRINGS_01	Coal Springs Reservoir	PH	2012	2035	Low
SD-MU-L-LITTLE_MOREAU_NO1_01	Little Moreau No. 1	PH	2020	2035	Low
SD-MU-R-MOREAU_01	Moreau River	Salinity/SAR	2016	2035	Low
SD-MU-R-MOREAU_01	Moreau River	TOTAL SUSPENDED SOLIDS	2006	2030	High
SD-MU-R-MOREAU_02	Moreau River	Salinity/SAR	2016	2035	Low
SD-MU-R-MOREAU_03	Moreau River	Salinity/SAR	2018	2035	Low
SD-MU-R-MOREAU_03	Moreau River	TOTAL SUSPENDED SOLIDS	2004	2030	High
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	Salinity/SAR	2018	2035	Low
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	SPECIFIC CONDUCTIVITY	2016	2035	Low
SD-MU-R-MOREAU_S_FORK_01	South Fork Moreau River	TOTAL DISSOLVED SOLIDS	2004	2035	Low
SD-MU-R-RABBIT_01	Rabbit Creek	ESCHERICHIA COLI	2020	2030	High
SD-MU-R-RABBIT_01	Rabbit Creek	TOTAL SUSPENDED SOLIDS	2020	2030	High

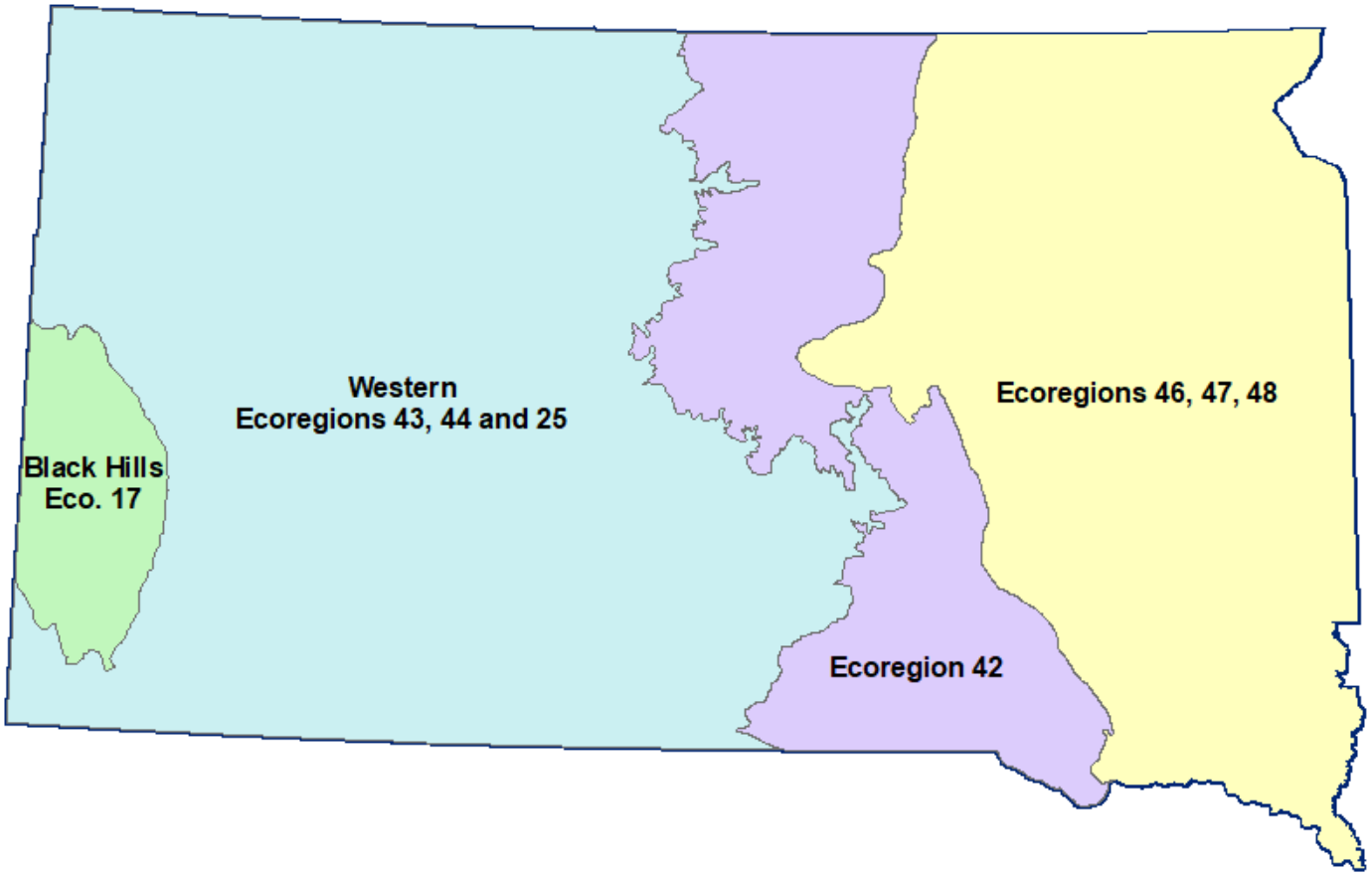
AUID	Waterbody Name	Cause	Cycle First Listed	TMDL Schedule	Priority
SD-NI-L-RAHN_01	Rahn Lake	CHLOROPHYLL-A	2010	2035	Low
SD-NI-L-RAHN_01	Rahn Lake	DISSOLVED OXYGEN	2020	2035	Low
SD-VM-L-E_VERMILLION_01	East Vermillion Lake	CHLOROPHYLL-A	2010	2026	High
SD-VM-L-HENRY_01	Lake Henry	PH	2018	2035	Low
SD-VM-L-MARINDAHL_01	Marindahl Lake	DISSOLVED OXYGEN	2022	2035	Low
SD-VM-L-MARINDAHL_01	Marindahl Lake	TEMPERATURE	2022	2035	Low
SD-VM-L-SILVER_01	Silver Lake	PH	2010	2035	Low
SD-VM-L-SPIRIT_01	Spirit Lake	MERCURY IN FISH TISSUE	2022	2026	High
SD-VM-L-THOMPSON_01	Lake Thompson	CHLOROPHYLL-A	2014	2026	High
SD-VM-R-LONG_01	Long Creek	TOTAL SUSPENDED SOLIDS	2020	2024	High
SD-VM-R-VERMILLION_01	Vermillion River	ESCHERICHIA COLI	2020	2026	High
SD-VM-R-VERMILLION_01	Vermillion River	TOTAL SUSPENDED SOLIDS	2020	2026	High
SD-VM-R-VERMILLION_02	Vermillion River	ESCHERICHIA COLI	2020	2026	High
SD-VM-R-VERMILLION_03	Vermillion River	ESCHERICHIA COLI	2014	2022	High
SD-WH-L-ALLAN_DAM_01	Allan Dam	PH	2014	2035	Low
SD-WH-R-COTTONWOOD_01	Cottonwood Creek	SPECIFIC CONDUCTIVITY	2004	2035	Low
SD-WH-R-LITTLE_WHITE_01	Little White River	ESCHERICHIA COLI	2012	2028	High
SD-WH-R-WHITE_02	White River	ESCHERICHIA COLI	2010	2028	High
SD-WH-R-WHITE_03	White River	ESCHERICHIA COLI	2012	2028	High
SD-WH-R-WHITE_04	White River	ESCHERICHIA COLI	2010	2028	High

APPENDIX E

ECOREGION MAPS



Ecoregion Map for Nutrient Criteria- Streams

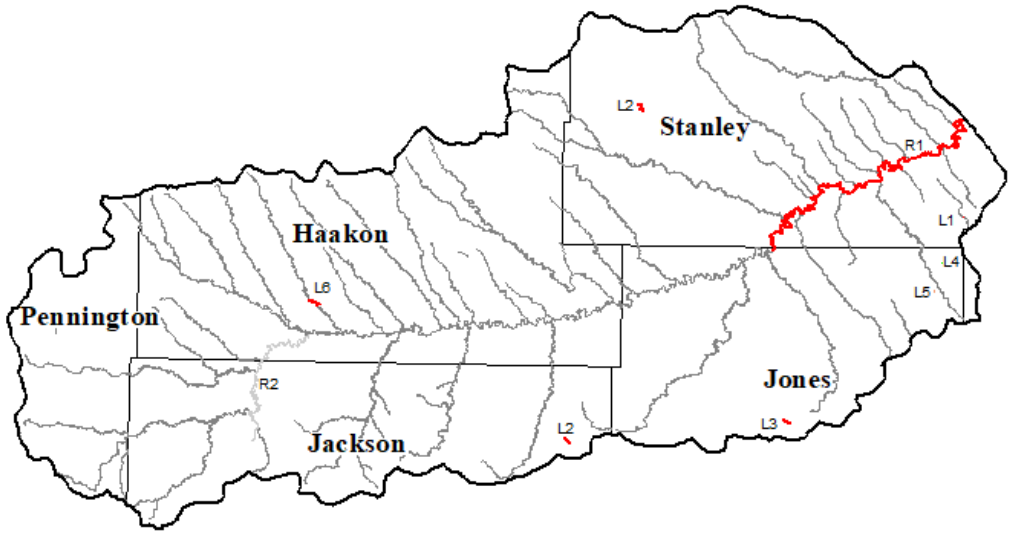


Ecoregion Map for Nutrient Criteria- Lakes

APPENDIX F

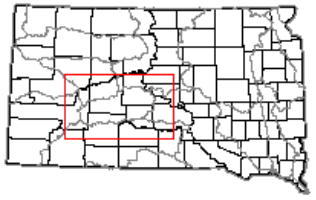
GIS - BASIN SUPPORT MAPS

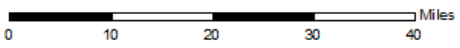
Bad River Basin



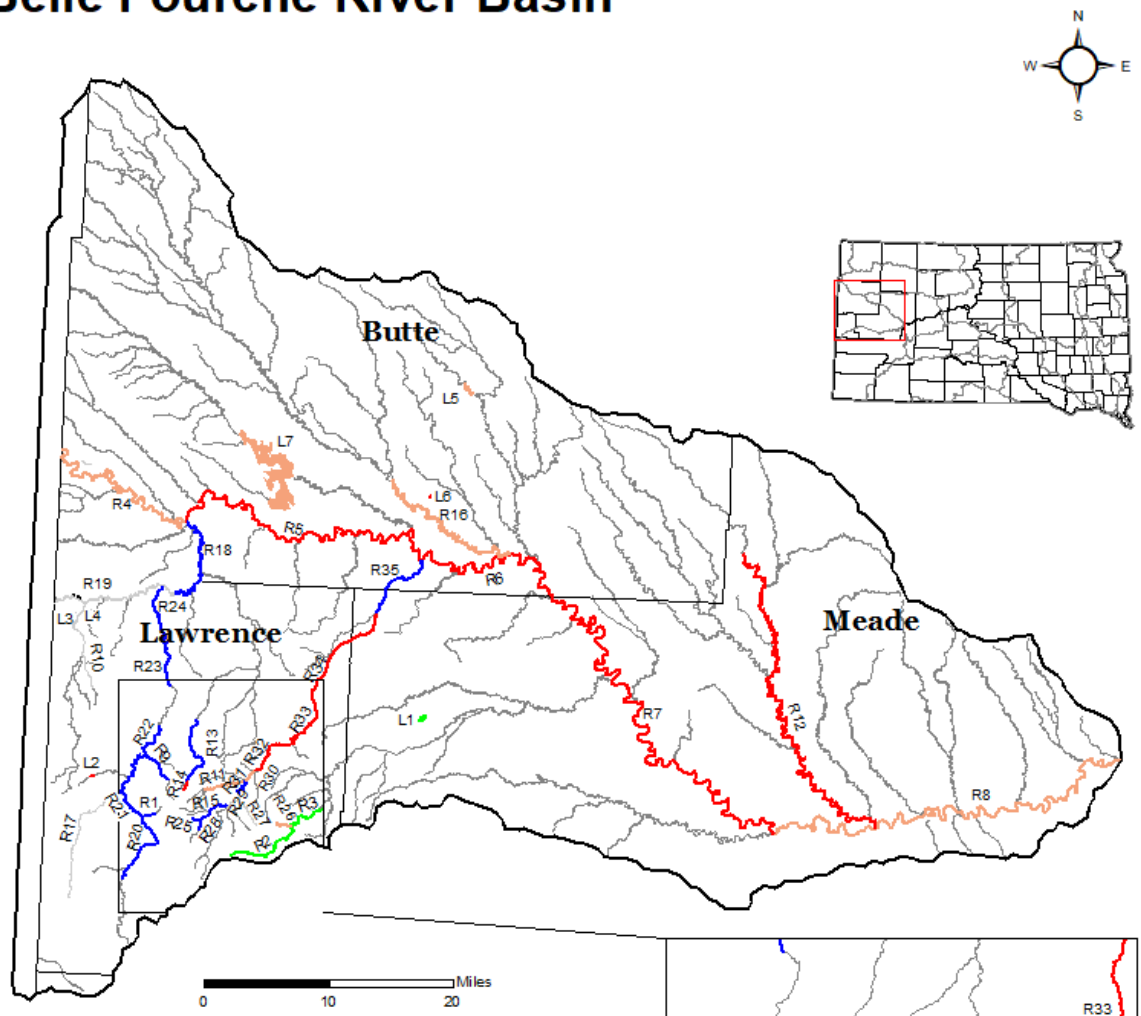
Integrated Report Category Legend

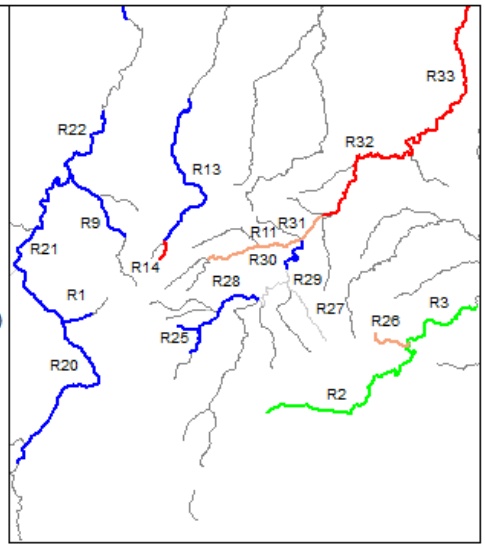
- All Uses Met (1)
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)





Belle Fourche River Basin





Integrated Report Category Legend

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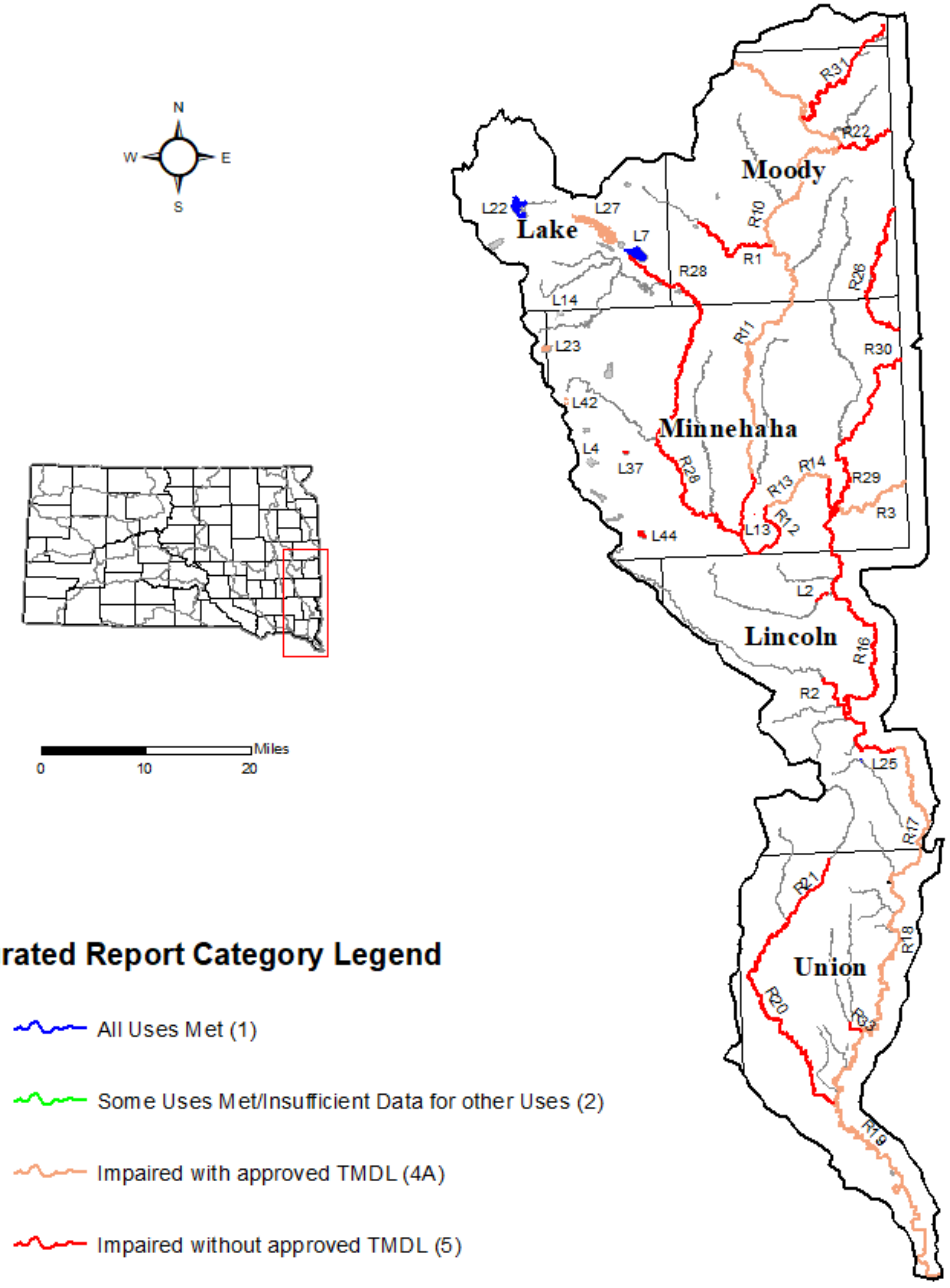
Lower Big Sioux River Basin



Integrated Report Category Legend

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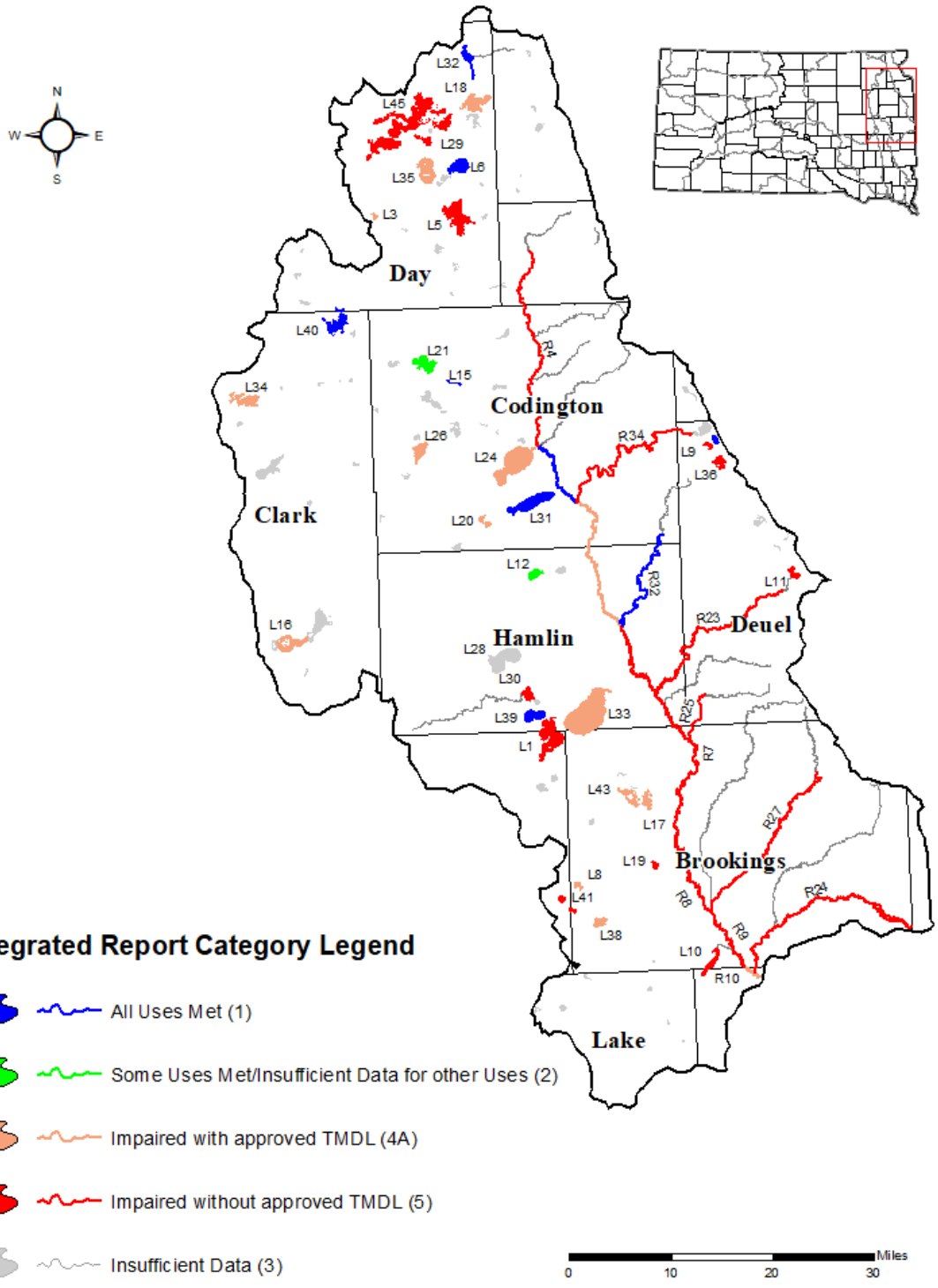
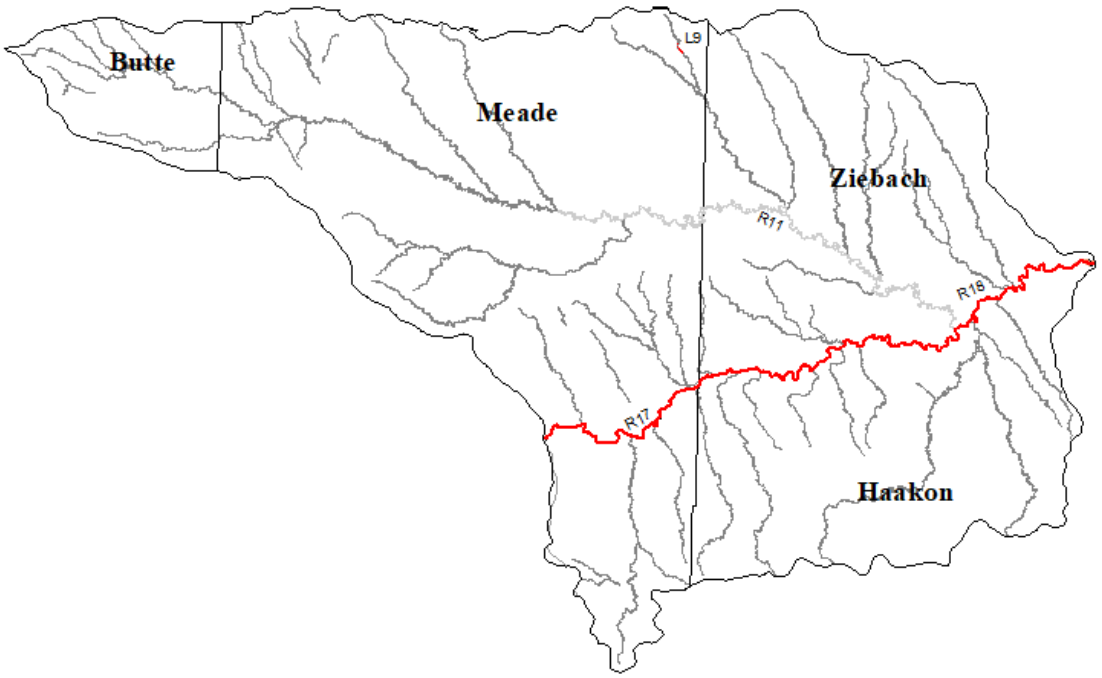
Upper Big Sioux River Basin



Lower Cheyenne River Basin



Integrated Report Category Legend

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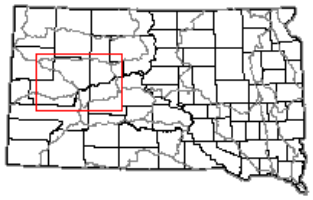
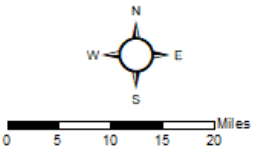
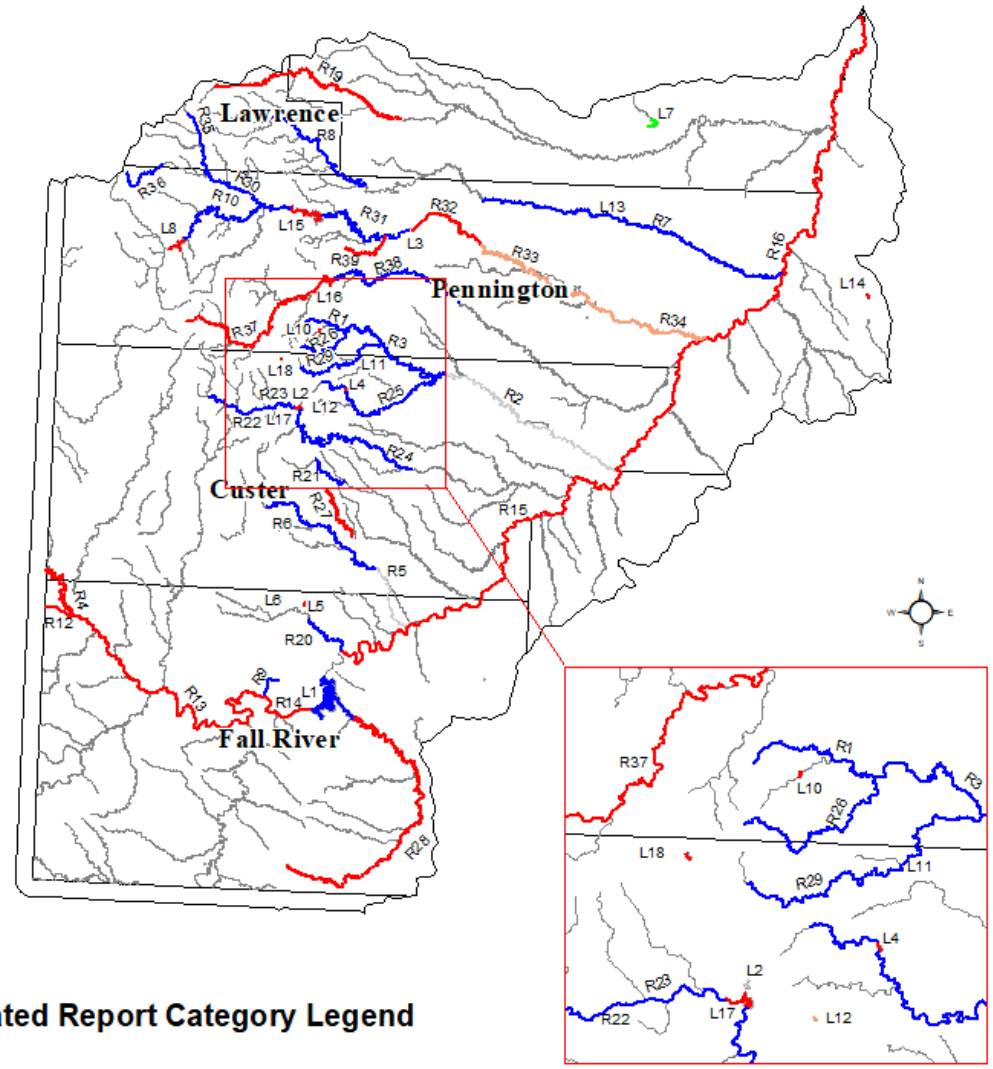
- Impaired without approved TMDL (5)
- Insufficient Data (3)





Upper Cheyenne River Basin



Integrated Report Category Legend

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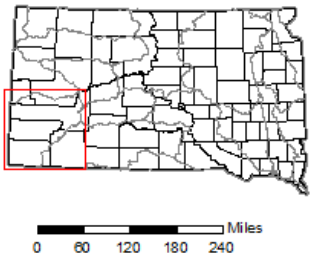
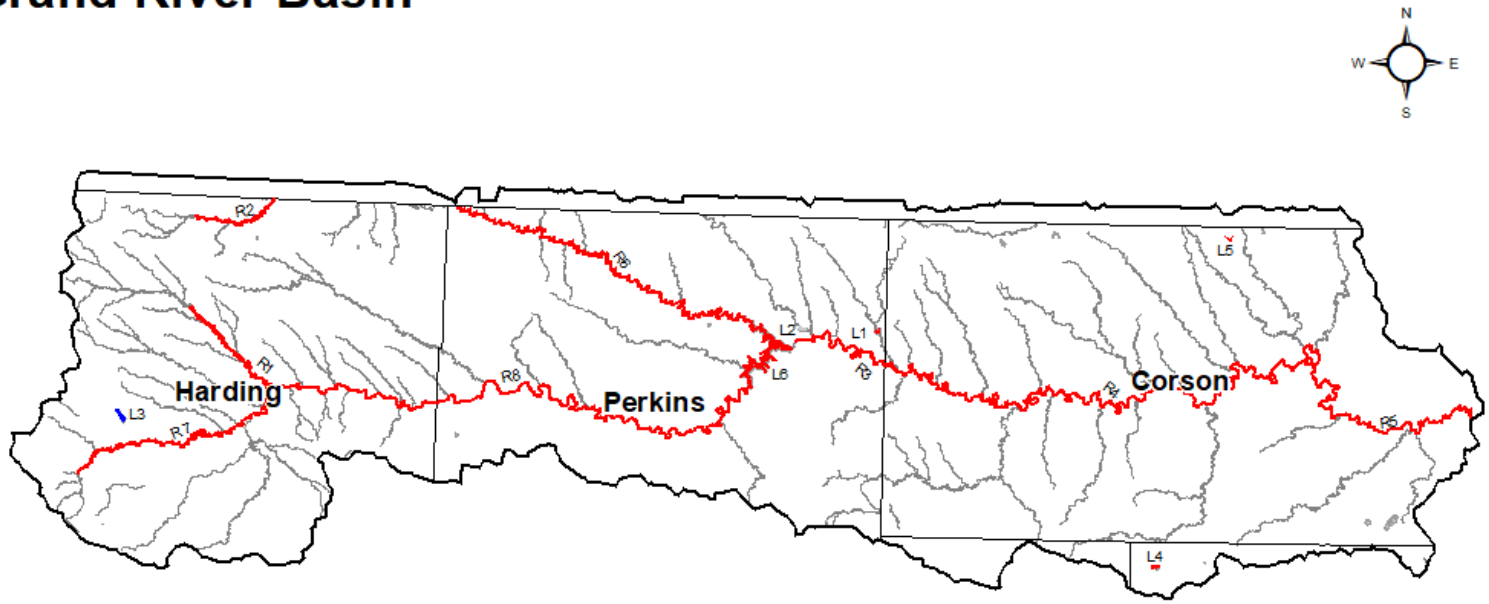
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)



Grand River Basin



Integrated Report Category Legend

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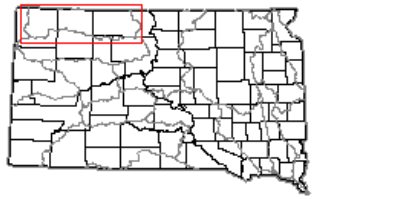
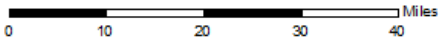
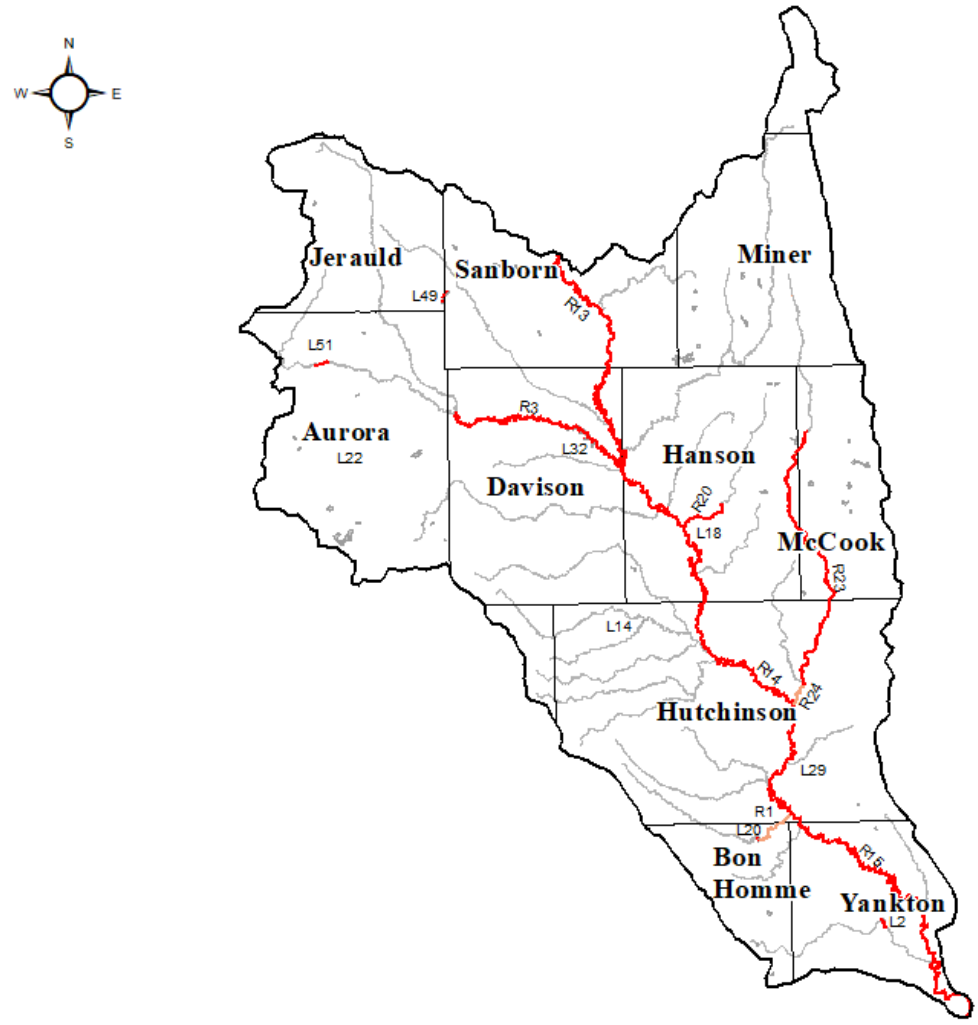
- Impaired without approved TMDL (5)
- Insufficient Data (3)



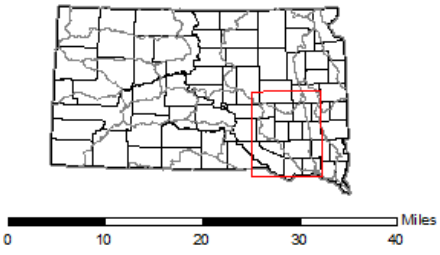


Lower James River Basin

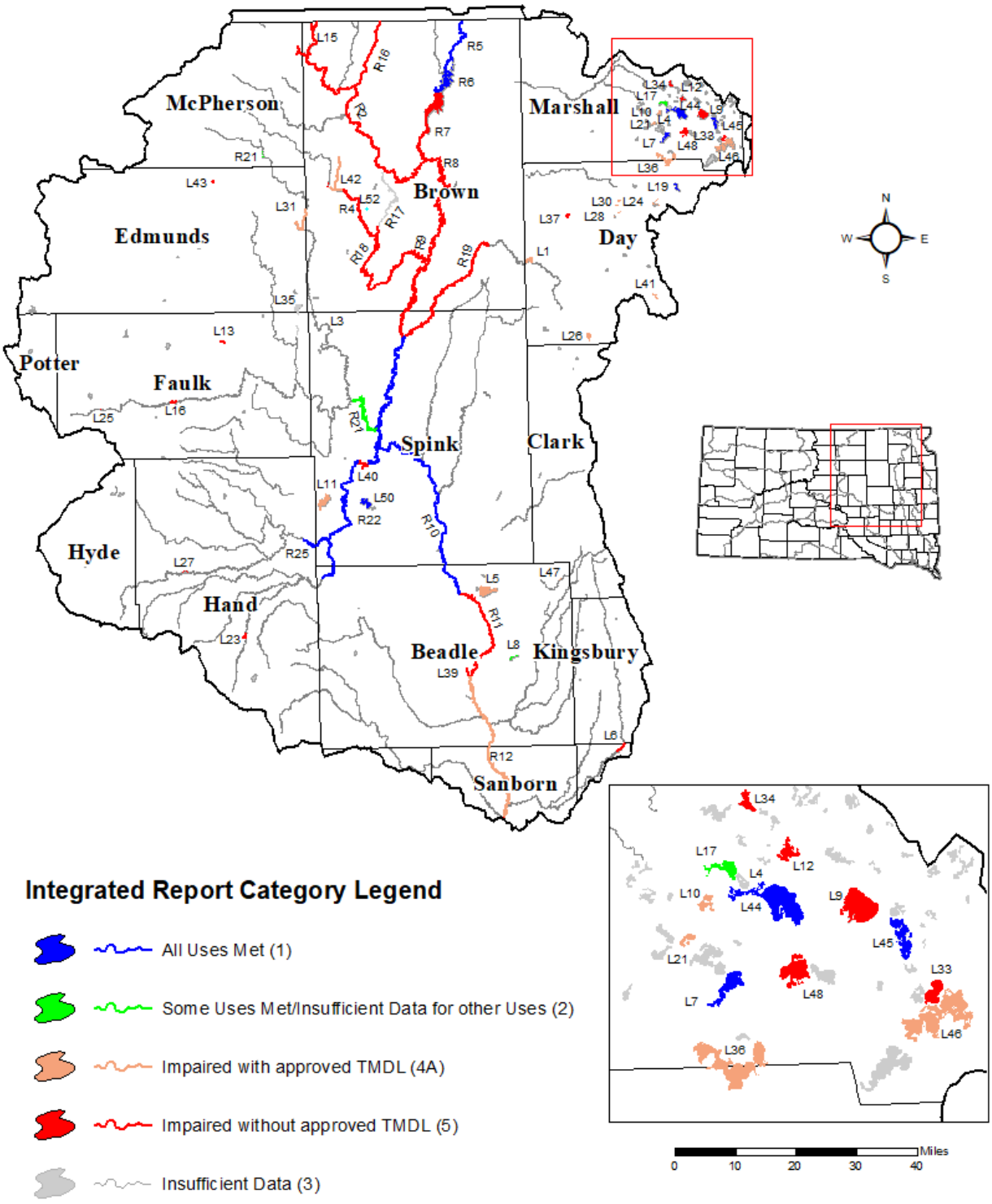


Integrated Report Category Legend

- 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)



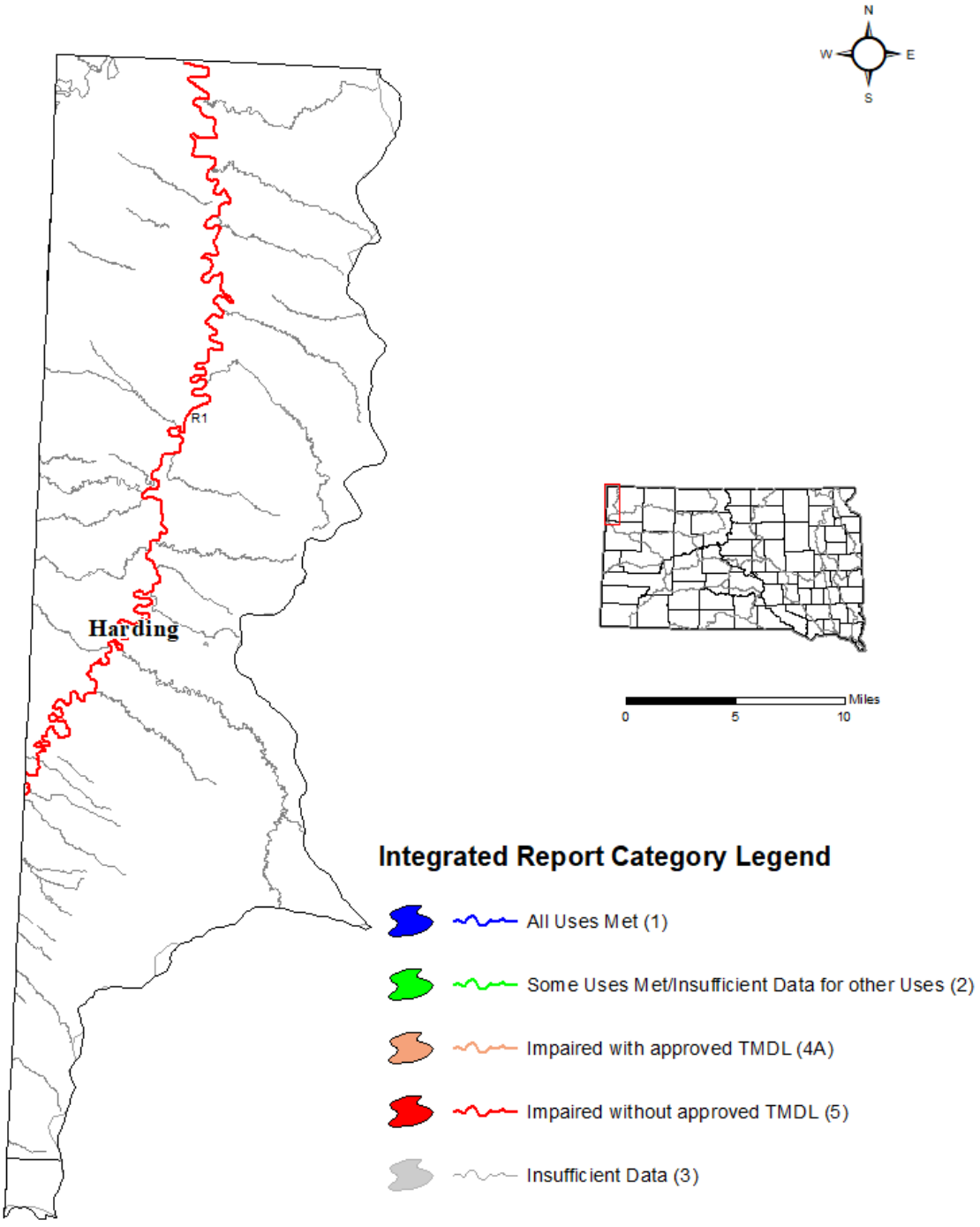
Upper James River Basin



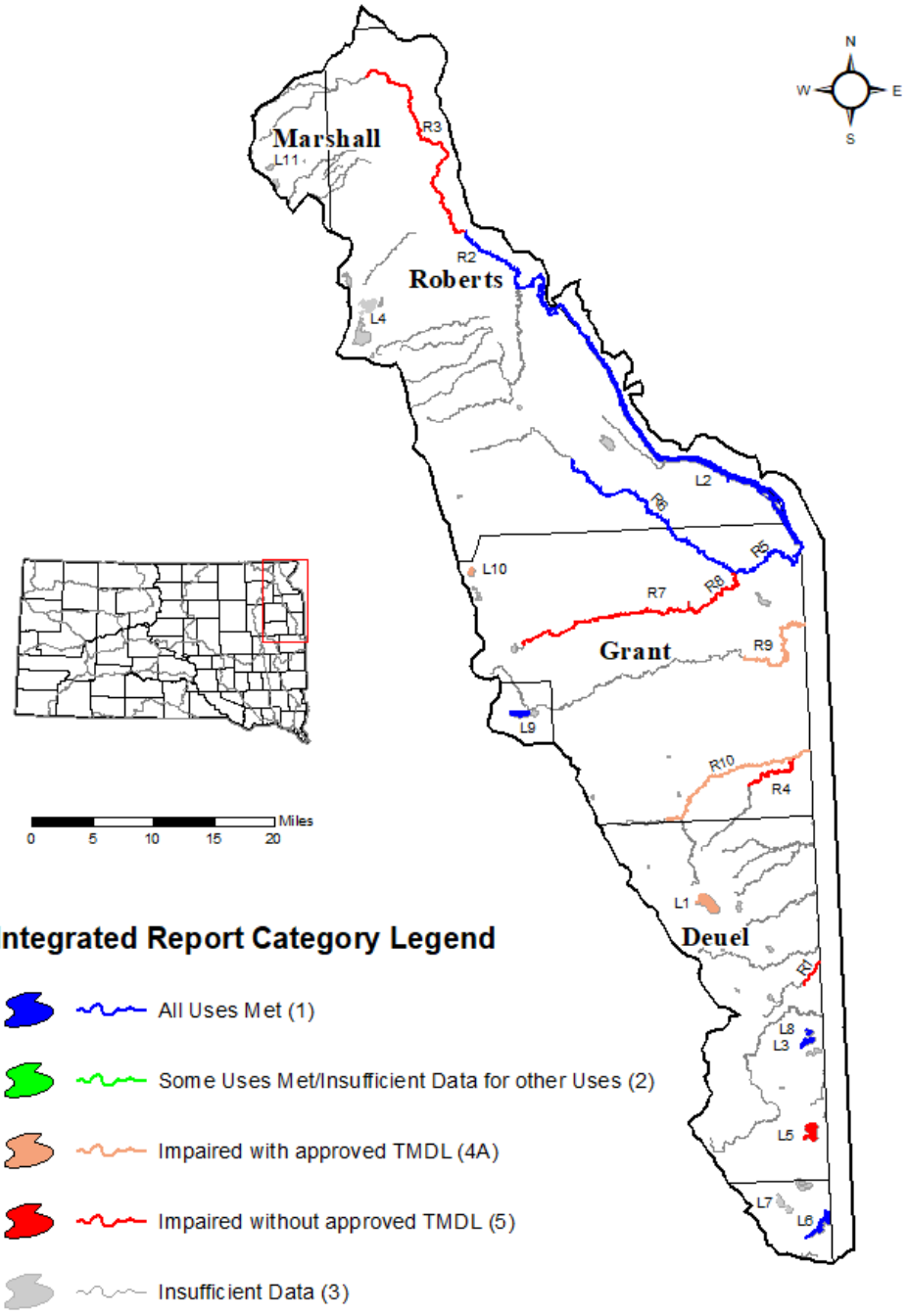
Integrated Report Category Legend

- 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)

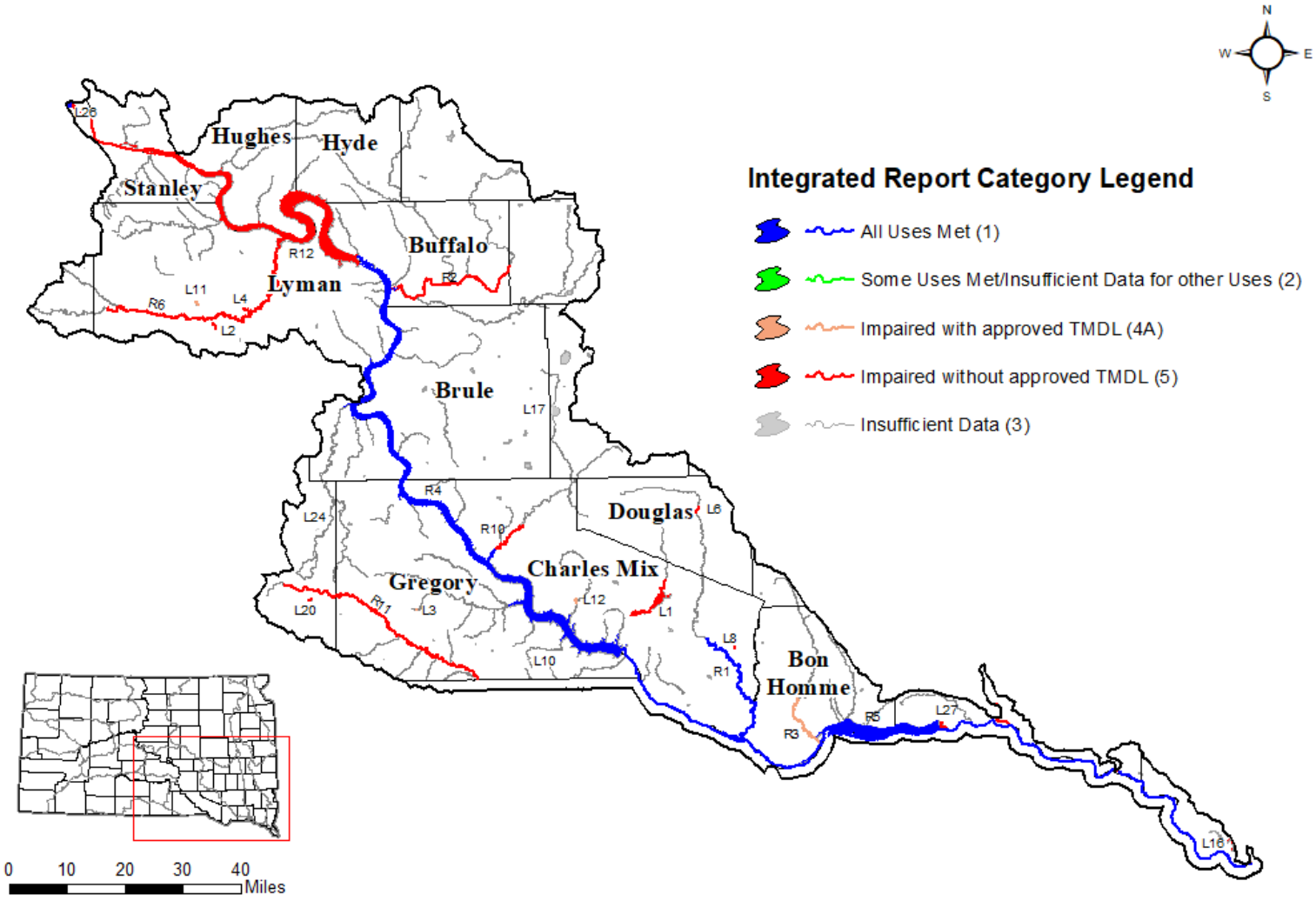
Little Missouri River Basin



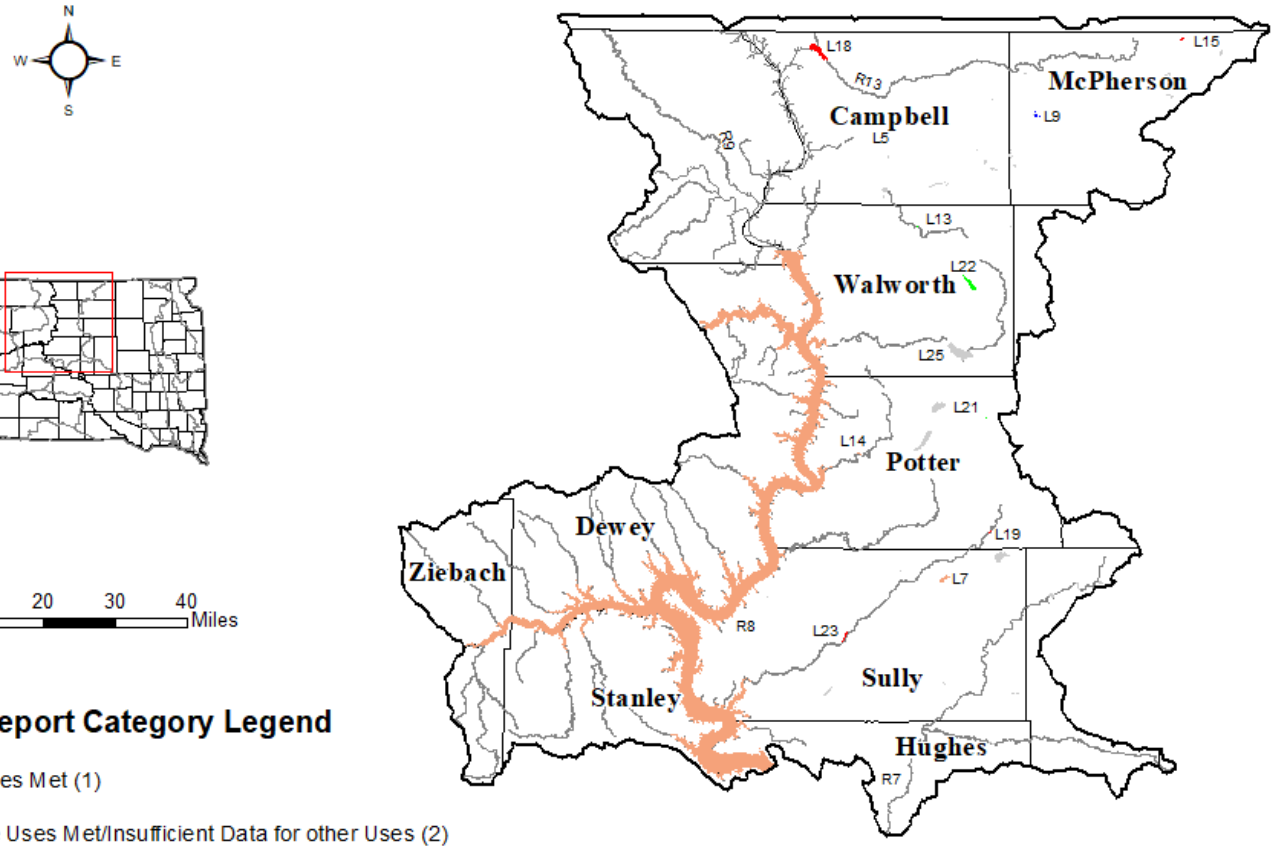
Minnesota River Basin



Lower Missouri River Basin



Upper Missouri River Basin



Integrated Report Category Legend

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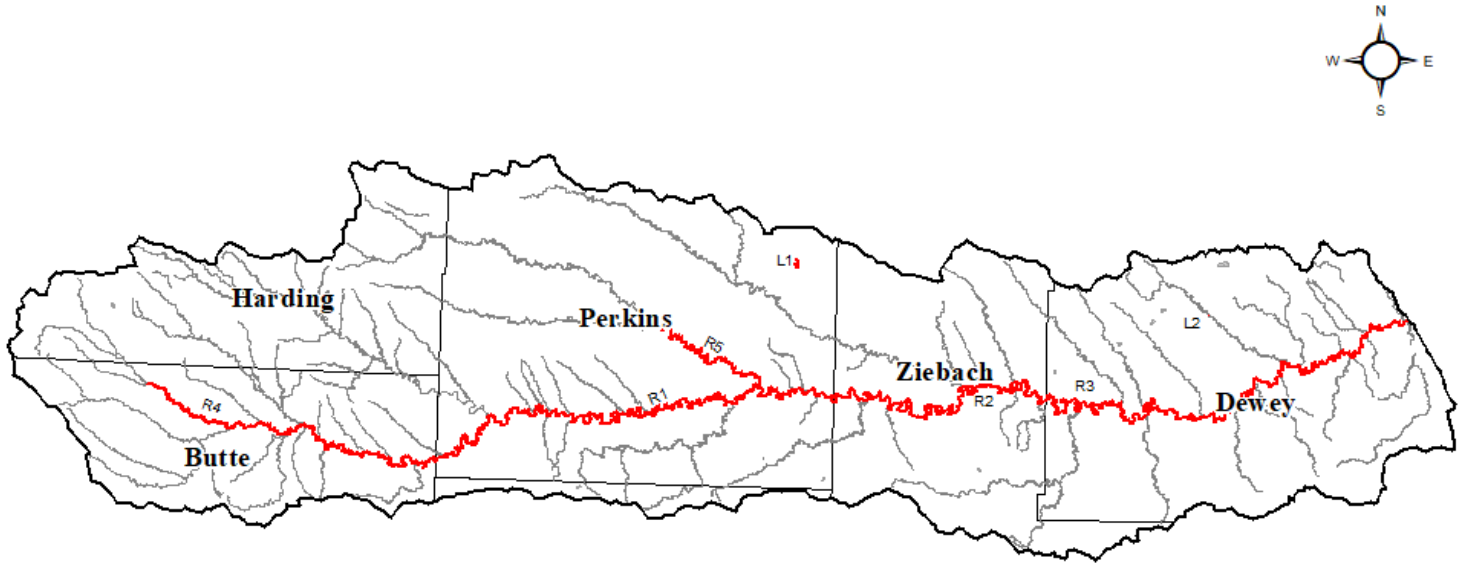
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)

Moreau River Basin



Integrated Report Category Legend

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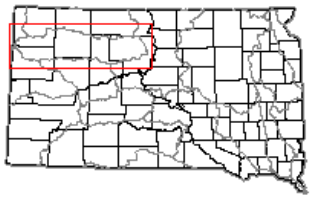
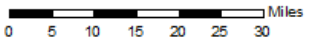
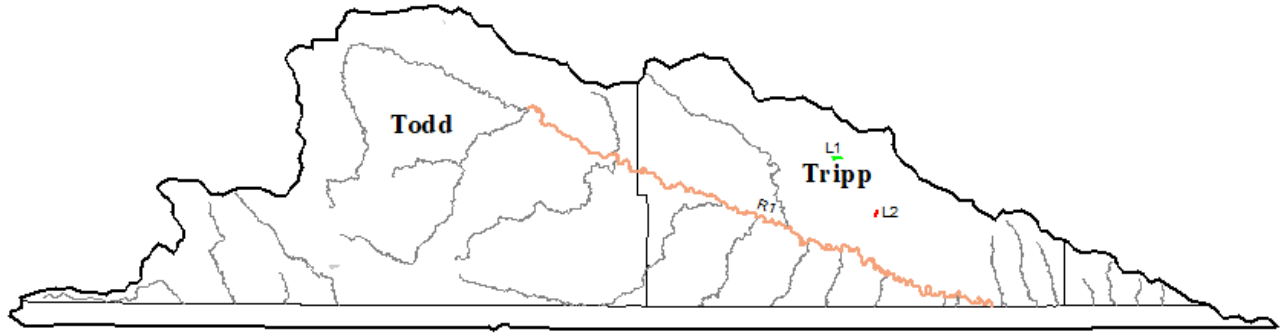
- Impaired without approved TMDL (5)
- Insufficient Data (3)





Niobrara River Basin



Integrated Report Category Legend

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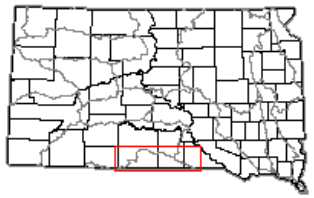
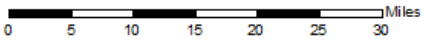
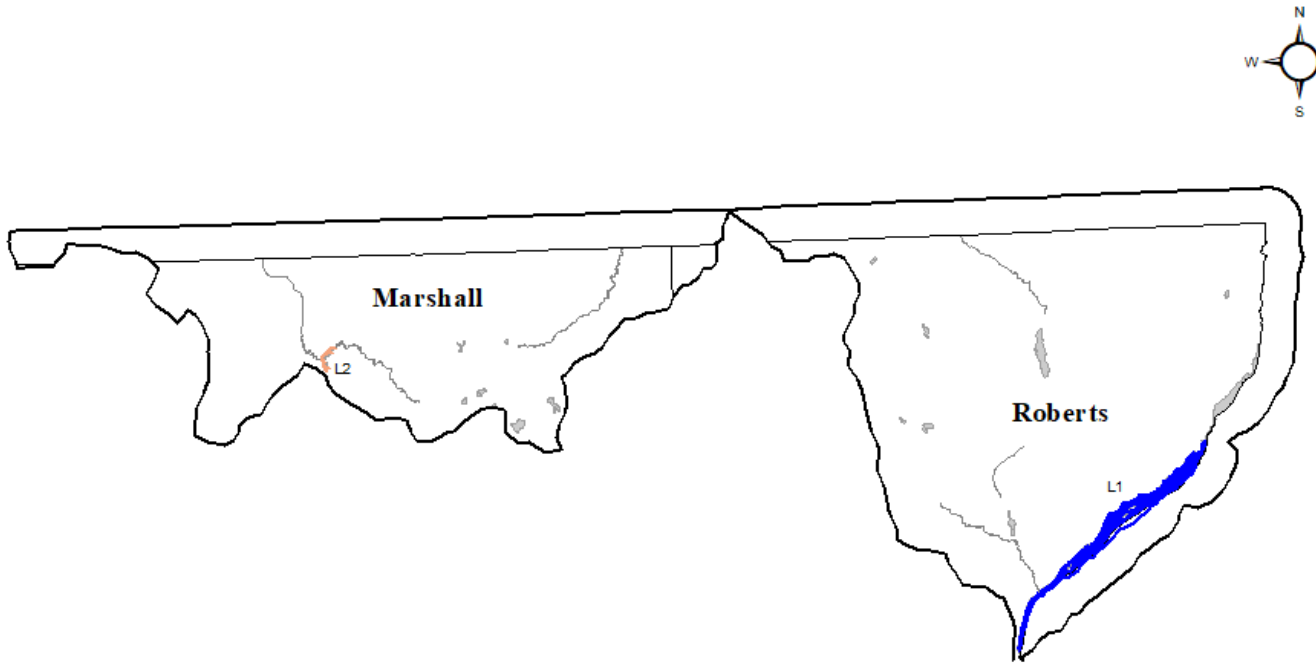
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)





Red River Basin



Integrated Report Category Legend

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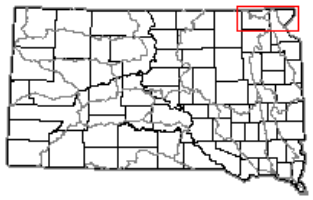
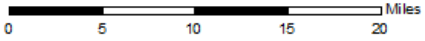
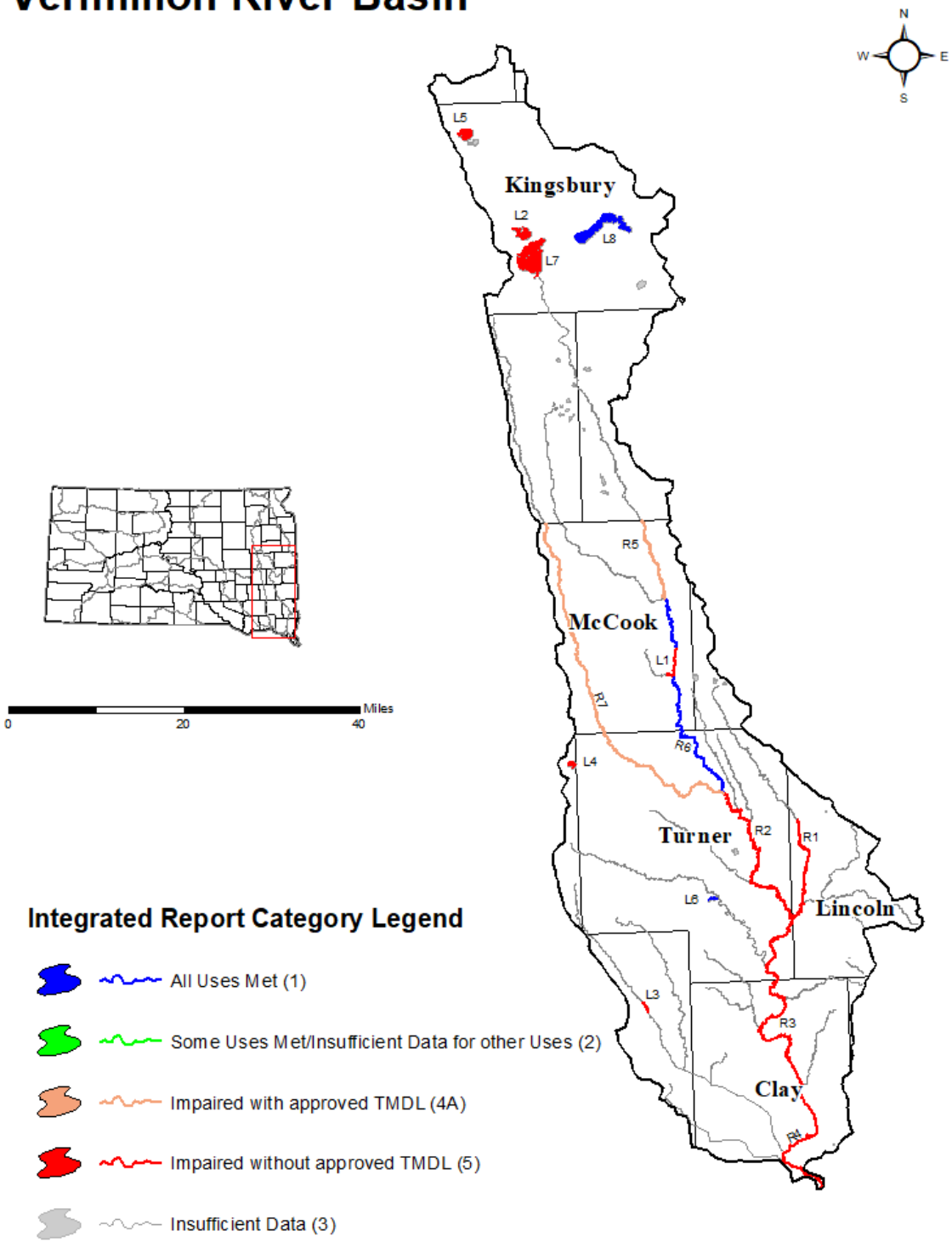
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)

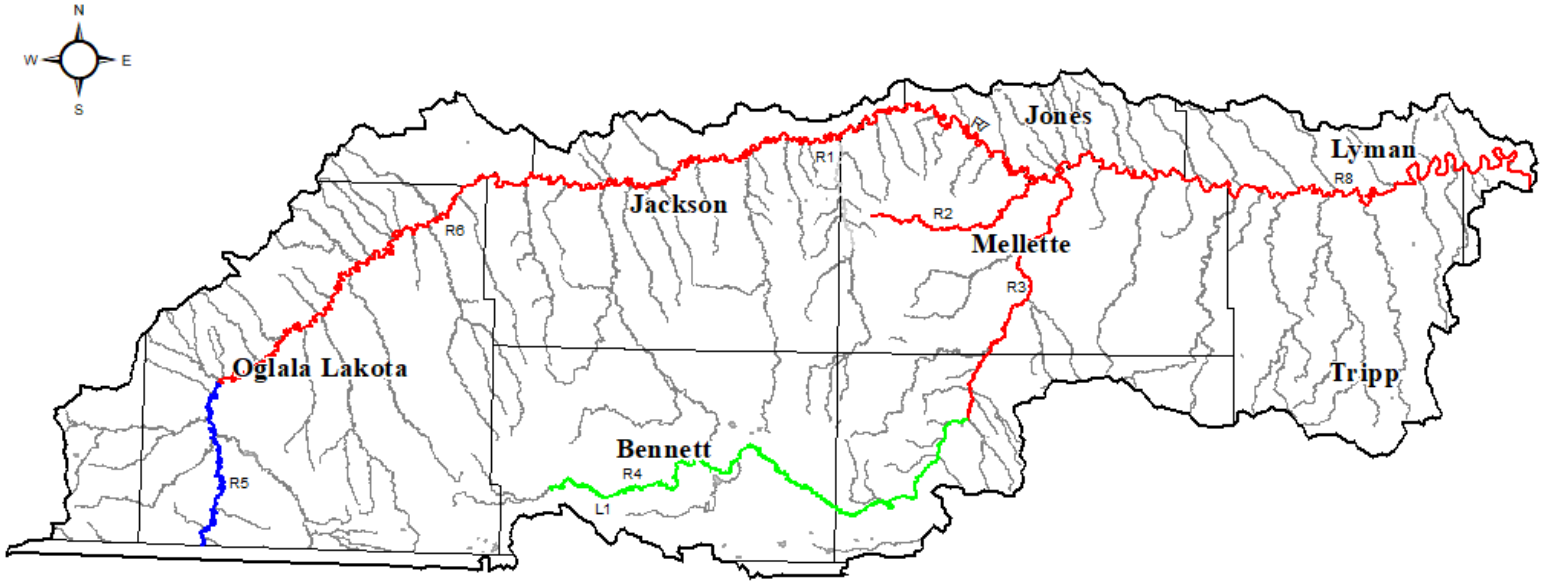




Vermillion River Basin



White River Basin



Integrated Report Category Legend

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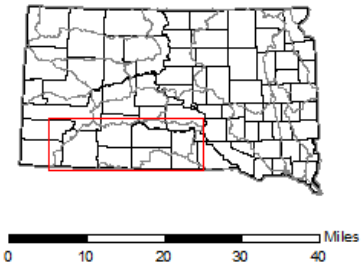
- Some Uses Met/Insufficient Data for other Uses (2)
- Impaired with approved TMDL (4A)
- Impaired without approved TMDL (5)
- Insufficient Data (3)



APPENDIX G

MEDIAN TSI CHLOROPHYLL-A BY WATERBODY

Assessment Unit	Lake Acres	Years Sampled	Mean Chl-a	Median Chl-a	Median TSI	Trophic State
SD-BA-L-FREEMAN_01	50	4	79.19	88.37	74.52	H
SD-BA-L-HAYES_01	51.1	3	22.77	21.63	60.73	E
SD-BA-L-MURDO_01	62.73	2	18.90	18.90	59.40	E
SD-BA-L-SHERIFF_01	20.6					U
SD-BA-L-WAGGONER_01	81.6	5	99.38	30.02	63.94	E
SD-BF-L-IRON_CREEK_01	23	4	2.46	2.37	39.06	O
SD-BF-L-MIRROR_EAST_01	3.8	4	2.72	2.65	40.16	M
SD-BF-L-MIRROR_WEST_01	4.3					U
SD-BF-L-NEWELL_01	154	3	3.11	3.06	41.57	M
SD-BF-L-NEWELL_CITY_01	23					U
SD-BF-L-ORMAN_01	6146.2	6	4.50	4.44	45.21	M
SD-BS-L-ALBERT_01	3619.39	5	97.46	50.14	68.96	E
SD-BS-L-ALVIN_01	98.3	4	57.48	57.21	70.26	H
SD-BS-L-ANTELOPE_01	197.2					U
SD-BS-L-BEAVER_01	324.97					U
SD-BS-L-BITTER_01	3142	3	81.65	75.10	72.92	H
SD-BS-L-BLUE_DOG_01	1495.6	4	14.57	9.43	52.59	E
SD-BS-L-BRANT_01	1033.5	9	15.72	13.62	56.19	E
SD-BS-L-BRUSH_01	291.9					U
SD-BS-L-BULLHEAD_01	343.47	6	32.50	33.54	65.03	E
SD-BS-L-CAMPBELL_01	975.9	11	103.35	115.34	77.13	H
SD-BS-L-CLEAR_D_01	527.5	6	45.29	36.58	65.88	E
SD-BS-L-CLEAR_H_01	705.7					U
SD-BS-L-COVELL_01	11.2	2	54.03	54.03	69.70	E
SD-BS-L-DIAMOND_01	176.8					U
SD-BS-L-DRY_01	218.62	2	57.24	57.24	70.26	H
SD-BS-L-DRY_NO2_01	1817.3					U
SD-BS-L-E_OAKWOOD_01	866.4	4	77.41	37.67	66.16	E
SD-BS-L-ENEMY_SWIM_01	2118.17	7	6.03	5.34	47.02	M
SD-BS-L-GOLDSMITH_01	289	4	30.39	24.47	61.94	E
SD-BS-L-GOOSE_01	488.5					U
SD-BS-L-GRASS_01	2275.66					U
SD-BS-L-HERMAN_01	1236.41	7	15.16	18.24	59.05	E
SD-BS-L-ISLAND_N_01	280.2					U
SD-BS-L-KAMPESKA_01	5010.63	5	5.88	6.63	49.13	M
SD-BS-L-LONG_COD_01	1226					U
SD-BS-L-MADISON_01	2683.08	12	58.71	18.22	59.05	E
SD-BS-L-MARSH_01	3016.27					U
SD-BS-L-MINNEWASTA_01	585	3	27.47	30.30	64.03	E
SD-BS-L-NORDEN_01	704.3	3	36.98	16.75	58.22	E
SD-BS-L-PELICAN_01	2781.2	5	38.68	23.69	61.62	E
SD-BS-L-PICKEREL_01	655.24	6	14.35	10.46	53.60	E

Assessment Unit	Lake Acres	Years Sampled	Mean Chl-a	Median Chl-a	Median TSI	Trophic State
SD-BS-L-POINSETT_01	7793.8	13	32.45	7.86	50.80	E
SD-BS-L-REID_01	1660					U
SD-BS-L-RUSH_01	2152.2					U
SD-BS-L-SCHOOL_01	1014.5	4	39.87	34.79	65.38	E
SD-BS-L-SCOTT_01	111.2					U
SD-BS-L-SINAI_01	646.1	2	8.40	8.40	51.46	E
SD-BS-L-ST_JOHN_01	1249.7	5	52.83	46.46	68.22	E
SD-BS-L-SWAN_01	1928					U
SD-BS-L-TWIN_01	513	2	13.77	13.77	56.30	E
SD-BS-L-TWIN_02	150					U
SD-BS-L-W_OAKWOOD_01	1101.69	8	88.32	65.91	71.65	H
SD-BS-L-WALL_01	215	6	50.10	24.73	62.04	E
SD-BS-L-WAUBAY_01	9455.3	7	25.46	26.93	62.87	E
SD-CH-L-ANGOSTURA_01	4195.95	4	3.81	3.73	43.50	M
SD-CH-L-BISMARK_01	22.93	3	26.20	14.51	56.81	E
SD-CH-L-CANYON_01	30.52	2	2.45	2.45	39.36	O
SD-CH-L-CENTER_01	24	5	6.30	5.09	46.54	M
SD-CH-L-COLD_BROOK_01	33.7	4	2.16	1.78	36.23	O
SD-CH-L-COTTONWOOD_SPRINGS_01	29.9	5	2.47	2.59	39.94	O
SD-CH-L-CURLEW_01	152.6	3	24.87	22.03	60.90	E
SD-CH-L-DEERFIELD_01	338.2	6	6.55	3.17	41.90	M
SD-CH-L-DURKEE_01	152.26					U
SD-CH-L-HORSETHIEF_01	17.2	5	10.91	9.03	52.17	E
SD-CH-L-LAKOTA_01	8.1	4	7.48	5.78	47.79	M
SD-CH-L-LEGION_01	5.5	3	7.47	3.78	43.62	M
SD-CH-L-NEW_UNDERWOOD_01	32.37					U
SD-CH-L-NEW_WALL_01	33.8	2	9.40	9.40	52.56	U
SD-CH-L-PACTOLA_01	822.14	4	2.65	1.57	35.05	O
SD-CH-L-SHERIDAN_01	367.92	6	6.16	6.22	48.51	M
SD-CH-L-STOCKADE_01	125.4	5	11.44	12.44	55.31	E
SD-CH-L-SYLVAN_01	18.1	3	11.32	11.87	54.85	E
SD-GR-L-EAST_LEMMON_01	168					U
SD-GR-L-FLAT_CREEK_01	161.2	3	33.86	29.50	63.77	E
SD-GR-L-GARDNER_01	190.13	3	7.42	7.36	50.16	E
SD-GR-L-ISABEL_01	112.6	2	21.86	21.86	60.83	E
SD-GR-L-PUDWELL_01	105					U
SD-GR-L-SHADEHILL_01	5069.93	3	9.13	5.39	47.10	M
SD-JA-L-AMSDEN_01	199.49	5	14.86	6.41	48.80	M
SD-JA-L-BEAVER_01	130.12	4	35.72	33.35	64.97	E
SD-JA-L-BIERMAN_01	15.14	5	25.71	21.17	60.52	E
SD-JA-L-BULLHEAD_02	157.4					U
SD-JA-L-BYRON_01	1773.8	3	36.08	25.73	62.43	E

Assessment Unit	Lake Acres	Years Sampled	Mean Chl-a	Median Chl-a	Median TSI	Trophic State
SD-JA-L-CARTHAGE_01	206.93	5	51.27	43.25	67.52	E
SD-JA-L-CATTAIL_01	594.53	4	29.42	15.32	57.35	E
SD-JA-L-CAVOUR_01	234.92					U
SD-JA-L-CLEAR_M_01	1198.8	9	12.88	12.86	55.63	E
SD-JA-L-CLUBHOUSE_01	208.1					U
SD-JA-L-COTTONWOOD_01	1443.96	2	16.27	16.27	57.94	E
SD-JA-L-COTTONWOOD_M_01	338.1	5	25.24	8.43	51.49	E
SD-JA-L-CRESBARD_01	66.5	3	72.23	90.79	74.78	H
SD-JA-L-DIMOCK_01	95.84					U
SD-JA-L-ELM_01	1220	3	14.34	18.50	59.19	E
SD-JA-L-FAULKTON_01	103.7	5	45.34	47.49	68.43	E
SD-JA-L-FOUR_MILE_01	369.85					U
SD-JA-L-HANSON_01	58.06					U
SD-JA-L-HAZELDON_01	319					U
SD-JA-L-HENRY_01	43.3	4	32.88	29.99	63.93	E
SD-JA-L-HORSESHOE_01	137.3					U
SD-JA-L-JAIL_POND_01	0.9	2	66.04	66.04	71.66	H
SD-JA-L-JONES_01	98.8	3	25.65	29.09	63.63	E
SD-JA-L-LARDY_01	121.4					U
SD-JA-L-LATHAM_01	23	2	24.45	24.45	61.93	E
SD-JA-L-LILY_01	539.8					U
SD-JA-L-LOUISE_01	163.72	4	33.80	29.95	63.91	E
SD-JA-L-LYNN_01	56.7					U
SD-JA-L-MENNO_01	39.9	2	40.19	40.19	66.80	E
SD-JA-L-MID_LYNN_01	435					U
SD-JA-L-MINA_01	696.7	3	12.80	8.08	51.08	E
SD-JA-L-MITCHELL_01	701.35	10	26.67	21.07	60.47	E
SD-JA-L-N_BUFFALO_01	421.2	5	11.63	10.69	53.82	E
SD-JA-L-NINE_MILE_01	244.81					U
SD-JA-L-NORTH_SCATTERWOOD_01	931.9					U
SD-JA-L-OPITZ_01	1799					U
SD-JA-L-PIERPONT_01	74.16	2	14.38	14.38	56.73	E
SD-JA-L-PIYAS_01	1954.51					U
SD-JA-L-RAVINE_01	64.29	3	29.07	36.85	65.95	E
SD-JA-L-REDFIELD_01	152.26	3	36.59	36.04	65.73	E
SD-JA-L-REETZ_01	245					U
SD-JA-L-RICHMOND_01	739.2					U
SD-JA-L-ROSETTE_01	16.35	4	72.64	75.91	73.03	H
SD-JA-L-ROY_01	1720.7	6	9.51	7.29	50.07	M
SD-JA-L-S_RED_IRON_01	623.8	7	16.22	13.68	56.23	E
SD-JA-L-SOUTH_BUFFALO_01	2041.3	7	24.44	18.69	59.29	E
SD-JA-L-STAUM_01	39.7					U

Assessment Unit	Lake Acres	Years Sampled	Mean Chl-a	Median Chl-a	Median TSI	Trophic State
SD-JA-L-STINK_01	788.62					U
SD-JA-L-TWIN_01	186.7	5	52.49	36.53	65.86	E
SD-JA-L-TWIN_02	977	3	48.94	32.66	64.76	E
SD-JA-L-WILMARTH_01	106.2	3	11.50	9.83	52.99	E
SD-JA-L-WYLIE_01	6.76					U
SD-MI-L-ANDES_01	4603.1	3	199.64	112.94	76.92	H
SD-MI-L-BRAKKE_01	86.4	2	34.48	34.48	65.29	E
SD-MI-L-BURKE_01	30.7	6	72.81	33.33	64.96	E
SD-MI-L-BYRE_01	80.4	2	9.11	9.11	52.25	E
SD-MI-L-CAMPBELL_01	47.4	4	17.66	17.87	58.85	E
SD-MI-L-CORSICA_01	97.1	3	83.69	111.02	76.75	H
SD-MI-L-COTTONWOOD_01	450.1	4	24.68	19.49	59.71	E
SD-MI-L-DANTE_01	15.47	3	33.05	18.02	58.93	E
SD-MI-L-EUREKA_01	188.4	4	12.63	13.40	56.03	E
SD-MI-L-FAIRFAX_01	24.11	2	22.87	22.87	61.27	E
SD-MI-L-FATE_01	99.47	3	32.23	24.56	61.97	E
SD-MI-L-GEDDES_01	79.23	4	150.66	150.11	79.71	H
SD-MI-L-HIDDENWOOD_01	20.74	3	65.71	73.65	72.73	U
SD-MI-L-HURLEY_01	106					U
SD-MI-L-MCCOOK_01	295.81	10	11.87	11.01	54.11	E
SD-MI-L-PLATTE_01	116.81					U
SD-MI-L-POCASSE_01	1370.8	10	2181.40	43.87	67.66	E
SD-MI-L-POTTS_01	47.1					U
SD-MI-L-ROOSEVELT_01	86.5	4	20.47	18.80	59.35	E
SD-MI-L-SULLY_01	212.3	5	70.99	51.29	69.19	E
SD-MI-L-SULLY_DAM_01	75.3					U
SD-MI-L-SWAN_01	2462.69					U
SD-MI-L-YANKTON_01	322.2					U
SD-MN-L-ALICE_01	1056	2	35.93	35.93	65.70	E
SD-MN-L-BIG_STONE_01	5753.1	2	29.36	29.36	63.72	E
SD-MN-L-COCHRANE_01	359	14	11.50	10.87	53.98	E
SD-MN-L-DRYWOOD_NORTH_01	918.09					U
SD-MN-L-FISH_01	735	3	63.46	74.72	72.88	H
SD-MN-L-HENDRICKS_01	880.8	6	41.52	9.07	52.20	E
SD-MN-L-OAK_01	400.44	2	45.84	45.84	68.09	E
SD-MN-L-OLIVER_01	152	13	15.85	14.07	56.51	E
SD-MN-L-PUNISHED_WOMAN_01	479	5	9.61	9.01	52.15	E
SD-MN-L-SUMMIT_01	170.4					U
SD-MN-L-TURTLE_FOOT_01	122.2					U
SD-MU-L-COAL_SPRINGS_01	91	2	9.09	9.09	52.23	E
SD-MU-L-LITTLE_MOREAU_NO1_01	34	4	52.68	53.65	69.63	E
SD-NI-L-DOG_EAR_01	178.25					U

Assessment Unit	Lake Acres	Years Sampled	Mean Chl-a	Median Chl-a	Median TSI	Trophic State
SD-NI-L-RAHN_01	19.11	3	16.87	17.53	58.66	E
SD-RD-L-TRAVERSE_01	5120.7	2	14.79	14.79	57.00	E
SD-RD-L-WHITE_01	173.8	2	42.56	42.56	67.36	E
SD-VM-L-E_VERMILLION_01	530.9	4	11.98	10.99	54.09	E
SD-VM-L-HENRY_01	1157.36	3	52.78	22.96	61.31	E
SD-VM-L-MARINDAHL_01	106.81	2	31.73	31.73	64.48	E
SD-VM-L-SILVER_01	389.4	3	268.41	181.45	81.57	H
SD-VM-L-SWAN_01	172.74					U
SD-VM-L-THOMPSON_01	5325.63	4	24.05	21.78	60.79	E
SD-VM-L-WHITEWOOD_01	4335.4	3	65.14	67.63	71.90	H
SD-WH-L-ALLAN_DAM_01	4.7	3	212.14	222.54	83.57	H

APPENDIX H

STATE STATISTICAL SURVEY

2012 and 2017 National Lakes Survey Results for SD

Indicator	Category	2012 NResp	2012 Estimate.P	2012 StdError.P	2012 LCB95Pct.P	2012 UCB95Pct.P	2017 NResp	2017 Estimate.P	2017 StdError.P	2017 LCB95Pct.P	2017 UCB95Pct.P
ACID_COND	Good	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
ACID_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
DIS_O2_CLS	Moderate (> 3 - < 5 ppm)	1	13.8	9.3	0.0	32.0					
DIS_O2_CLS	High (>= 5 ppm)	42	85.3	9.3	67.1	100.0					
DIS_O2_CLS	Not Assessed	1	0.9	0.8	0.0	2.5					
DIS_O2_CLS	Total	44	100.0	0.0	100.0	100.0					
PTL_COND	Good	7	12.1	8.3	0.0	28.4	8	6.3	3.3	0.0	12.8
PTL_COND	Fair	5	5.0	3.1	0.0	11.0	4	33.9	16.3	2.0	65.9
PTL_COND	Poor	32	83.0	8.7	66.0	100.0	31	59.7	15.3	29.7	89.8
PTL_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
NTL_COND	Good	4	1.1	0.9	0.0	2.9	6	9.5	4.9	0.0	19.2
NTL_COND	Fair	8	27.5	10.9	6.1	48.9	5	17.4	8.9	0.0	34.9
NTL_COND	Poor	32	71.4	10.9	49.9	92.8	32	73.2	10.3	53.0	93.3
NTL_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
CHLA_COND	Good	25	57.3	10.8	36.2	78.4	21	24.5	9.4	6.0	42.9
CHLA_COND	Fair	4	2.6	1.5	0.0	5.5	3	14.3	8.1	0.0	30.1
CHLA_COND	Poor	15	40.1	10.9	18.8	61.4	19	61.3	12.4	36.9	85.6
CHLA_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
CYNX_REC	Low	20	55.4	12.1	31.6	79.2					
CYNX_REC	Moderate	9	14.0	8.8	0.0	31.3					
CYNX_REC	High	13	26.6	10.0	7.0	46.2					
CYNX_REC	Not Assessed	2	3.9	2.9	0.0	9.7					
CYNX_REC	Total	44	100.0	0.0	100.0	100.0					
TROPHIC_STATE	Oligotrophic	5	33.2	12.3	9.1	57.2					
TROPHIC_STATE	Mesotrophic	8	10.1	4.6	1.0	19.1					
TROPHIC_STATE	Eutrophic	13	28.4	10.4	8.0	48.8					
TROPHIC_STATE	Hypereutrophic	18	28.4	10.0	8.7	48.0					
TROPHIC_STATE	Total	44	100.0	0.0	100.0	100.0					
EPA_ATZ_COND	Below Benchmark	17	29.0	10.1	9.3	48.8					

NLA continued		2012 NResp	2012 Estimate.P	2012 StdError.P	2012 LCB95Pct.P	2012 UCB95Pct.P	2017 NResp	2017 Estimate.P	2017 StdError.P	2017 LCB95Pct.P	2017 UCB95Pct.P
Indicator	Category										
EPA_ATZ_COND	Not Detected	27	71.0	10.1	51.2	90.7					
EPA_ATZ_COND	Total	44	100.0	0.0	100.0	100.0					
EPA_MICX_COND	Below Benchmark	22	33.0	10.6	12.3	53.6					
EPA_MICX_COND	Exceeds Benchmark	3	1.7	1.1	0.0	4.0					
EPA_MICX_COND	Not Detected	19	65.3	10.7	44.4	86.2					
EPA_MICX_COND	Total	44	100.0	0.0	100.0	100.0					
WHO_MICX_COND	Low	23	33.8	10.6	13.0	54.6					
WHO_MICX_COND	High	2	0.9	0.8	0.0	2.4					
WHO_MICX_COND	Not Detected	19	65.3	10.7	44.4	86.2					
WHO_MICX_COND	Total	44	100.0	0.0	100.0	100.0					
BENT_MMI_COND	Good	15	51.7	12.4	27.3	76.1	14	43.1	14.5	14.6	71.6
BENT_MMI_COND	Fair	11	16.3	8.9	0.0	33.7	14	26.8	9.7	7.8	45.8
BENT_MMI_COND	Poor	11	25.9	9.9	6.5	45.3	9	18.1	8.8	0.8	35.3
BENT_MMI_COND	Not Assessed	7	6.0	3.2	0.0	12.3	6	12.1	7.4	0.0	26.6
BENT_MMI_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
ZOOP_MMI_COND	Good	16	70.8	9.9	51.4	90.2	12	58.7	12.7	33.8	83.6
ZOOP_MMI_COND	Fair	13	8.6	3.3	2.0	15.1	12	14.9	7.0	1.2	28.5
ZOOP_MMI_COND	Poor	14	20.3	9.3	2.1	38.6	19	26.4	9.7	7.5	45.4
ZOOP_MMI_COND	Not Assessed	1	0.3	0.3	0.0	0.8					
ZOOP_MMI_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
LITRIPCVR_COND	Good	6	17.0	10.5	0.0	37.6	8	30.4	16.6	0.0	63.0
LITRIPCVR_COND	Fair	8	7.5	3.6	0.4	14.5	9	13.7	6.6	0.8	26.6
LITRIPCVR_COND	Poor	29	75.4	10.7	54.5	96.3	23	55.4	14.3	27.4	83.4
LITRIPCVR_COND	Not Assessed	1	0.1	0.1	0.0	0.3	3	0.5	0.3	0.0	1.2
LITRIPCVR_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
LITCVR_COND	Good	13	25.8	10.7	4.8	46.8	17	50.5	13.4	24.3	76.7
LITCVR_COND	Fair	12	22.0	9.2	3.9	40.0	5	8.3	3.9	0.6	16.0
LITCVR_COND	Poor	18	52.1	12.3	28.1	76.1	18	40.6	12.2	16.8	64.5
LITCVR_COND	Not Assessed	1	0.1	0.1	0.0	0.3	3	0.5	0.3	0.0	1.2
LITCVR_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0

NLA continued		2012 NResp	2012 Estimate.P	2012 StdError.P	2012 LCB95Pct.P	2012 UCB95Pct.P	2017 NResp	2017 Estimate.P	2017 StdError.P	2017 LCB95Pct.P	2017 UCB95Pct.P
Indicator	Category										
RVEG_COND	Good	7	4.1	1.9	0.3	7.9	9	30.6	16.4	0.0	62.7
RVEG_COND	Fair	6	3.3	1.6	0.2	6.4	7	7.4	3.3	0.9	13.9
RVEG_COND	Poor	30	92.4	2.8	87.0	97.9	24	61.4	15.0	32.1	90.7
RVEG_COND	Not Assessed	1	0.1	0.1	0.0	0.3	3	0.5	0.3	0.0	1.2
RVEG_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0
RDIS_COND	Good	1	0.9	0.8	0.0	2.5					
RDIS_COND	Fair	14	19.6	9.5	1.0	38.2	23	53.8	12.9	28.6	79.0
RDIS_COND	Poor	28	79.4	9.5	60.8	98.0	17	45.7	12.8	20.6	70.8
RDIS_COND	Not Assessed	1	0.1	0.1	0.0	0.3	3	0.5	0.3	0.0	1.2
RDIS_COND	Total	44	100.0	0.0	100.0	100.0	43	100.0	0.0	100.0	100.0

2013-2014 National Rivers and Streams Assessment Results for SD.

Subpopulation	Indicator	Category	NResp	Estimate.P	StdError.P	LCB95Pct.P	UCB95Pct.P
SD	Total_Phosphorus	Good	9	10.6	3.7	3.4	17.8
SD	Total_Phosphorus	Fair	9	14.0	4.3	5.6	22.4
SD	Total_Phosphorus	Poor	40	75.4	5.2	65.1	85.6
SD	Total_Phosphorus	Total	58	100.0	0.0	100.0	100.0
SD	Total_Nitrogen	Good	9	12.6	4.0	4.9	20.4
SD	Total_Nitrogen	Fair	16	21.2	4.8	11.8	30.5
SD	Total_Nitrogen	Poor	33	66.2	5.6	55.2	77.1
SD	Total_Nitrogen	Total	58	100.0	0.0	100.0	100.0
SD	Salinity	Good	25	51.4	7.4	36.8	66.0
SD	Salinity	Fair	19	27.0	5.5	16.2	37.7
SD	Salinity	Poor	14	21.7	6.3	9.2	34.1
SD	Salinity	Total	58	100.0	0.0	100.0	100.0
SD	Acidification	None	58	100.0	0.0	100.0	100.0
SD	Acidification	Total	58	100.0	0.0	100.0	100.0
SD	Enterococci	Above Human Health Threshold	8	19.3	6.0	7.5	31.1
SD	Enterococci	Below Human Health Threshold	42	72.7	6.4	60.2	85.2
SD	Enterococci	Not Assessed	8	8.0	2.8	2.6	13.4
SD	Enterococci	Total	58	100.0	0.0	100.0	100.0
SD	Fish_MMI	Good	1	0.7	0.6	0.0	1.9
SD	Fish_MMI	Fair	15	28.7	6.5	16.0	41.5
SD	Fish_MMI	Poor	32	59.1	6.8	45.8	72.4
SD	Fish_MMI	Not Assessed	10	11.5	3.3	5.0	18.0
SD	Fish_MMI	Total	58	100.0	0.0	100.0	100.0
SD	Fish_Tissue_Mercury	Does Not Exceed 300 ng Hg/g ww	21	44.1	7.2	30.0	58.1
SD	Fish_Tissue_Mercury	Exceeds 300 ng Hg/g ww	7	8.7	3.4	2.1	15.3
SD	Fish_Tissue_Mercury	Not Assessed	30	47.3	6.8	33.9	60.6
SD	Fish_Tissue_Mercury	Total	58	100.0	0.0	100.0	100.0
SD	MacroInvert_MMI	Good	14	31.8	7.5	17.2	46.5
SD	MacroInvert_MMI	Fair	10	23.1	6.5	10.4	35.9
SD	MacroInvert_MMI	Poor	34	45.1	7.5	30.4	59.7

NRSA continued

Subpopulation	Indicator	Category	NRes p	Estimate. P	StdError. P	LCB95Pct. P	UCB95Pct. P
SD	MacroInvert_MMI	Total	58	100.0	0.0	100.0	100.0
SD	MacroInvert_OE	O/E < 0.5	8	9.8	3.3	3.4	16.2
SD	MacroInvert_OE	O/E < 0.8	18	22.1	5.2	12.0	32.3
SD	MacroInvert_OE	O/E < 0.9	7	15.3	5.5	4.5	26.2
SD	MacroInvert_OE	O/E >= 0.9	25	52.7	7.5	38.1	67.4
SD	MacroInvert_OE	Total	58	100.0	0.0	100.0	100.0
SD	Streambed_Sediment	Good	20	40.6	8.0	24.9	56.2
SD	Streambed_Sediment	Fair	27	44.4	7.5	29.8	59.1
SD	Streambed_Sediment	Poor	11	15.0	4.0	7.2	22.8
SD	Streambed_Sediment	Total	58	100.0	0.0	100.0	100.0
SD	Instream_Habitat	Good	26	56.1	7.1	42.1	70.1
SD	Instream_Habitat	Fair	17	24.4	6.1	12.4	36.3
SD	Instream_Habitat	Poor	15	19.5	4.5	10.7	28.4
SD	Instream_Habitat	Total	58	100.0	0.0	100.0	100.0
SD	Riparian_Vegetation	Good	28	44.3	6.6	31.4	57.1
SD	Riparian_Vegetation	Fair	6	7.3	3.0	1.5	13.1
SD	Riparian_Vegetation	Poor	24	48.5	6.4	36.0	60.9
SD	Riparian_Vegetation	Total	58	100.0	0.0	100.0	100.0
SD	Riparian_Disturbance	Low	2	4.3	2.5	0.0	9.2
SD	Riparian_Disturbance	Moderate	36	56.9	6.7	43.7	70.1
SD	Riparian_Disturbance	High	20	38.7	6.4	26.3	51.2
SD	Riparian_Disturbance	Total	58	100.0	0.0	100.0	100.0
SD	Microcystin	<= 10 ug/L	28	49.2	7.2	35.1	63.4
SD	Microcystin	Not Detected	30	50.8	7.2	36.6	64.9
SD	Microcystin	Total	58	100.0	0.0	100.0	100.0

APPENDIX I

PUBLIC COMMENTS

EPA Comments

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

Ref: 8WP-CWB
Shannon Minerich
Surface Water Quality Program
Department of Environment and Natural Resources
Joe Foss Building
523 East Capitol Avenue
Pierre, SD 57501-3181

Re: 2022 South Dakota Integrated Report for Surface Water Quality Assessment

Dear Ms. Minerich:

We have reviewed the Department's draft 2022 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 ongoing efforts to utilize common sense language when possible. We want to recognize the Department's continued efforts to refine an assessment methodology for nutrient-related narrative standards, and providing overall clarity and transparency on the Department's assessment methodologies. We look forward to continuing efforts with the Department in this endeavor. We found that information in the IR, GIS files, and the Assessment, Total Maximum Daily Load (TMDL) Tracking and Implementation System (ATTAINS) are consistent.

We have some additional comments that should be addressed prior to finalizing the document; these can be found in the enclosure. We look forward to receiving your final 2022 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 or rogers.liz@epa.gov. Again, thank you for your commitment and hard work on the 2022 Integrated Report.

Sincerely,

Elizabeth Rogers
Monitoring and Assessment Team
Water Quality Section
Clean Water Branch
Water Division

Surface Water Quality Monitoring (Page 8):
The second paragraph says "...The revised standards were submitted to EPA on April 27, 2021, and were approved on May 25, 2021..."; however, they were approved on June 25, 2021, so the approval date needs to be revised.

DANR Response - The EPA approval date has been corrected to June 25, 2021.

Table 2: Numeric Criteria Assigned to Beneficial Uses of Surface Waters of the State ARSD 74:51:01 (Page 10):

Alkalinity –"≤" needs to be included so use (9) should be ≤ 750/≤ 1313.

Barium – "≤" needs to be included so use (1) should be ≤ 1.0 with footnote 2 to indicate it's a daily max value.

Chloride – "≤" needs to be included so use (1) should be ≤ 1.0/≤ 250 and use (2) should be ≤ 100/≤ 175.

Total Coliform – "≤" needs to be included so use (1) should be ≤ 5,000 (geometric mean)/ ≤ 20,000

Microcystin – should indicate measurement unit of ug/L (row 1 of Table 2 says "mg/L except where noted").

Cylindrospermopsin – should indicate measurement unit of ug/L (row 1 of Table 2 says "mg/L except where noted").

Conductivity – "≤" needs to be included. It should be ≤ 4,000/≤ 7,000 for use (9) and ≤ 2,500/≤ 4,375 for use (10).

Fluoride – "≤" needs to be included. It should be ≤ 4.0 with footnote 2 to indicate it's a daily max value.

Hydrogen sulfide undisassociated – "≤" needs to be included. It should be ≤ 0.002 for uses (2) through (6) with footnote 2 to indicate daily max value.

Nitrogen, total ammonia as N – it refers to footnote #5, but I don't see the footnote beneath Table 2.

Nitrogen, nitrates as N – "≤" needs to be included. It should be Nitrates as N ≤ 10 mg/L daily max (with footnote 2 to indicate daily max value) for use (1) and for use (9), ≤ 50/≤ 88 (the footnotes were included).

Dissolved oxygen – For all uses except (6), "daily minimum" is not indicated as a special condition. For use (6), the dates are not listed, only months are. It should be ≥ 4.0 Oct 1 – Apr 30 and ≥ 5.0 May 1 – Sept 30 (note that the May 1 – Sept 30 date range is listed as footnote 4 beneath Table 2 so they could just add the footnote).

pH – "≤" and "≥" need to be included. For uses (1) through (5) it should be ≥ 6.5 - ≤ 9.0. For use (6) it should be ≥ 6.0 - ≤ 9.0. For uses (9) and (11) it should be ≥ 6.0 - ≤ 9.5. Also, in SD's WQS, for all uses except for use (1), the following special condition is included: "See: 74:51:01:07."

Sodium adsorption ratio – "≤" needs to be included so use (10) should be ≤ 10. Also, the following special condition is missing: "See definition." They may want to include a footnote with the definition or indicate where in the standards the definition can be found.

Suspended solids – "≤" needs to be included in all uses. Note that footnotes *were* included in SD's Table 2 for the following values (I just didn't include them here). It should be for use (2) ≤ 30 and ≤ 53; for use (3) ≤ 90 and ≤ 158; for use (4) ≤ 90 and ≤ 158; for use (5) ≤ 90 and ≤ 158; and for use (6) ≤ 150 and ≤ 263.

Total dissolved solids – "≤" needs to be included. Footnotes were included in Table 2; just showing values here. It should be for use (1) ≤ 1,000 and ≤ 1,750; for use (9) ≤ 2,500 and ≤ 4,375; and for use (11) ≤ 2,000 and ≤ 3,500.

Sulfate – "≤" needs to be included. Footnotes were included in Table 2. Use (1) should be ≤ 500 and ≤ 875.

Temperature – "≤" needs to be included. Use (2) should be ≤65; use (3) should be ≤75; use (4) should be ≤80; use (5) should be ≤90; and use (6) should be ≤90. Also, the following special condition was missing for each use" "See 74:51:01:31."

Total Petroleum Hydrocarbons – For use (1) footnote 2 is missing to indicate daily max. For use (9) the following special condition was missing: "See 74:51:01:10."

Oil and Grease – For use (9) the following special condition was missing: "See 74:51:01:10."

DANR Response - Table 2 is intended to be a summary of some of the water quality standards associated with each beneficial use. The table clearly cannot adequately summarize all water quality standards, with all special conditions, footnotes, site specific standards, toxics, equations, etc. It is noted at the bottom of Table 2 in bold font "For a complete list of WQS refer to ARSD 74:51." The recommended revisions have been made as appropriate.

TMDL/Vision Sections:

Pages 15-16: The last paragraph appears out of place in this section. Perhaps this information should be moved to a new section above the prioritization focusing on nonpoint sources/load allocations since there is a complementary point source/wasteload allocation discussion (spanning p. 15/16).

DANR Response - DANR agrees that this information is out of place in this section and the same information is discussed in the nonpoint source section. The last paragraph on page 16 was removed.

Pages 16-18: The second bullet in the TMDL prioritization may require revision. "…in waters assigned coldwater fisheries…" seems out of place, especially compared to the list of high priority TMDLs in Appendix D. Could be carry-over text from original Vision priorities that included temperature in coldwater fisheries (see top of p. 18).

DANR Response - This was carry-over text from the original Vision priorities that included temperature in coldwater fisheries. "In waters assigned coldwater fisheries" was removed from High Priority on page 16.

Pages 24-26: For Table 4, are there any considerations for seasonality associated with minimum sample sizes? For toxic parameters, are there any requirements for hardness, temperature, or other WQC-related parameters? Also, the minimum sample size (2 in 3 years) for assessment would need to be supplemented to support subsequent TMDL development.

Page 40: In Table 12, it would be useful to number the Beneficial Uses consistent with the 11 included on IR page 8.

Page 42: In Table 15, it would be useful to number the Beneficial Uses consistent with the 11 included on IR page 8.

DANR Response – Seasonality is not specifically associated with a minimum samples size unless a water quality standard is only valid during certain times of the year. Some water quality standards, such as *E. coli*, are only in effect from May 1 through September 30; therefore, that must be taken into consideration with project sample design in order to get enough samples for the project or period of time.
For any equation-based criterion, including toxics, the associated equation-based information (such as temperature, hardness, pH) must be available in order to determine if the criterion is met. The equation-based standards (including those for some toxics) are available at ARSD 74:51:01 Appendices A and B.
Tables 12 and 15 have been updated to include the numbers associated with the beneficial uses.

Stream Assessment Methodology for Nutrient-Related Narrative Standards (Page 28):

In the paragraph following Table 6, the most recent 5-year sampling period for streams needs to be revised from 2014-2019 to 2016-2021.

DANR Response – Thank you. The sampling period has been changed.

Appendix A Waterbodies with EPA Approved TMDLs (page 83):

Several TMDL EPA approvals have incorrect dates (along with other discrepancies). See attached for specific comments regarding each TMDL.

DANR Response – All EPA approval dates that had discrepancies have been updated based on suggestions from EPA.

Appendix B 2022 Delisting Report (Page 98-100):

The Delisting Report contains two lakes that should not be delisted and should be placed back in Category 5 (delistings were a mistake). Please change the following waterbody segment/pollutant combinations status to Category 5 and reflect these changes in the Integrated Report as well as ATTAINS:
SD-BS-L-ALVIN_01 (Lake Alvin) Temperature
SD-VM-L-MARINDAHL_01 (Marindahl Lake) Temperature

DANR Response - The above listed lakes are not included in our delisting report in Appendix B. The lakes are accurately placed in Category 5 in the IR document as well as in ATTAINS. The issue is that the ATTAINS database erroneously has the metadata to identify if something is a delisting as "yes." DANR has provided lengthy input on the ATTAINS delisting report to both EPA and the contractors that work on it identifying some of the issues with the delisting report and potential solutions. DANR has updated the ATTAINS database with a batch upload to work around and correct this specific error on these reported waters. This is an ATTAINS issue not a SD DANR issue. Perhaps this is a good opportunity for EPA to make meaningful updates to the delisting report so that all ATTAINS users, including state and tribal users and EPA reviewers, can provide and review accurate information.

Appendix D 303(d) Summary (Page 159):

Priorities were compared to the TMDL prioritization scheme on IR page 16 as well as the Vision priorities. Consider edits for consistency between the prioritization scheme and the priority rankings, the attached provides specific suggested edits.

DANR Response - Additional criteria was added to the *High Priority* prioritization scheme to validate specific priority rankings identified by EPA. The following prioritization scheme additions were integrated into the bulleted list on page 16. The first bullet reflects a revision to the original content presented in the draft document.

- *High Priority;* streams listed as impaired because of bacteria, TSS, and lakes impaired for mercury in fish flesh; and
- *High Priority*, select lakes impaired for Chlorophyll-a being considered for the 2022 303(d) Vision Priority.

New criteria additions resulted in seven priority year and ranking changes (bullets 1-7) and one (bullet 8) priority ranking change. The changes now reflect consistency between the prioritization scheme and priority rankings in Appendix D and ATTAINS.

- SD-GR-L-ISABEL_01; year changed to 2030.
- SD-GR-L-PUDWELL_01; year changed to 2030.
- SD-GR-R-GRAND_N_FORK_01; year changed to 2030
- SD-GR-R-GRAND_S_FORK_01; year changed to 2030
- SD-GR-R-GRAND_S_FORK_02 year changed to 2030
- SD-MU-R-MOREAU_01; year changed to 2030.
- SD-MU-R-MOREAU_03; year changed to 2030
- SD-JA-R-JAMES_09; priority changed low to high

Nancy Hilding
President
Prairie Hills Audubon Society
P.O. Box 788
Black Hawk, SD 57718
March 6th, 2022

Josh Strobel
Department of Agriculture and Natural Resources
Watershed Protection Program
523 East Capitol Avenue – Joe Foss Building
Pierre, South Dakota 57501-3181
1-605-773-6710.
Joshua.Strobel@state.sd.us,

Comments on the Draft 2022 Integrated Report

A. Proposed SD Shooting Complex and surface water quality base line data and monitoring.

We are concerned about SD Game, Fish and Parks proposed shooting range in Meade County, just east of Elk Vale Rd and north of Elk Creek. We provide 3 maps below.

We wish for you to be sure to list the 2 ponds (Maylor and Nelson ponds) on the unnamed tributary of Elk Creek as waters of the state for Meade County and assign correct beneficial uses to them. https://sdlegislature.gov/Rules/Administrative/28302

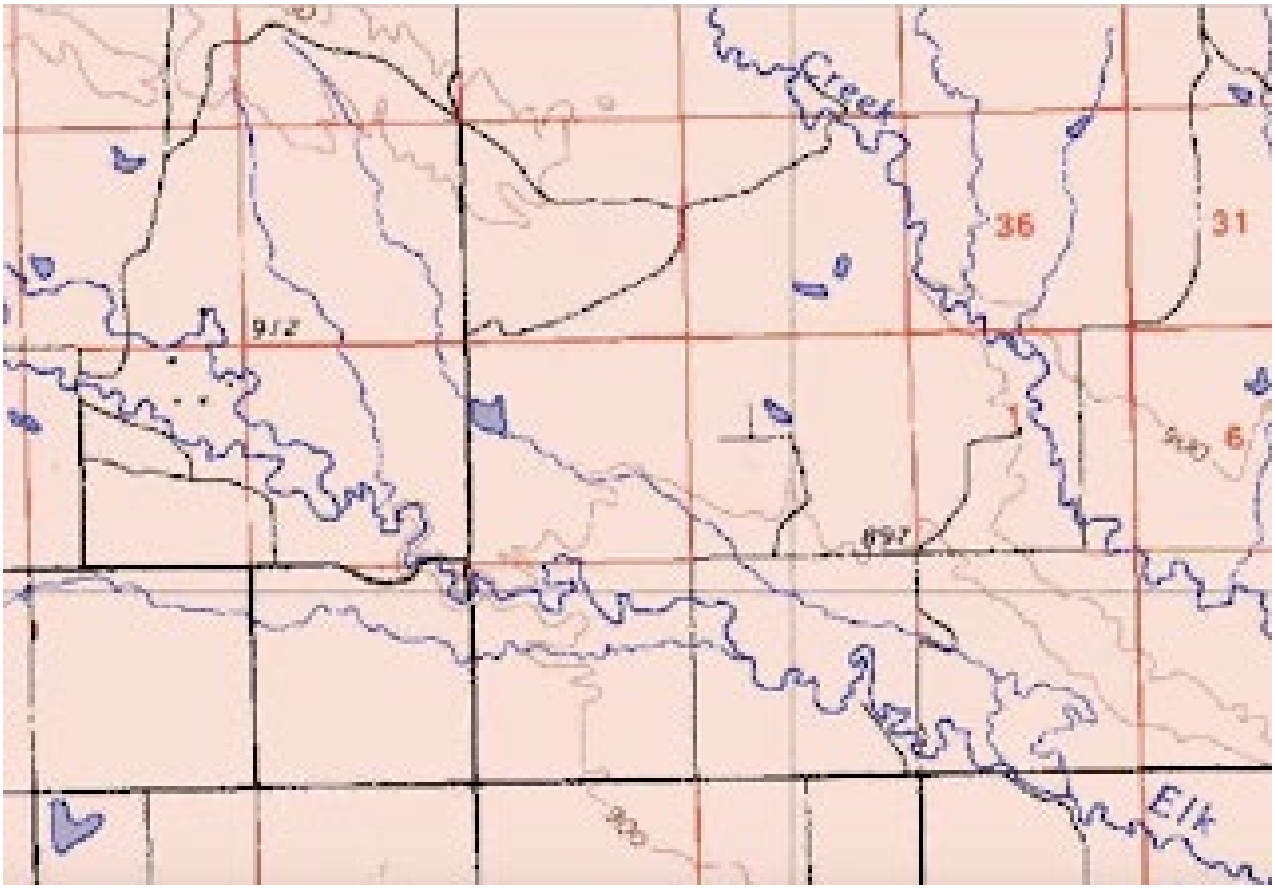
We believe the un-named pond on the edge of the property currently owned by the South Dakota Parks and Wildlife Foundation (soon to be bought by Game, Fish and Parks) is perennial and has fish in it. The property is currently owned by the Foundation and will be bought by SDGFP, it is encircled by green lines. The man-made pond can be called Marlor Pond (a former owner's name – the spelling uncertain). The man-made pond upstream of it is owned by Joe Norman, who says his pond has fish in it – it was stocked in 2005. It doesn't dry up and occasionally overflows. There is a third man-made small pond that is north of Marlor Pond, used to have bass in it under management of a former owner. It might be perennial or at least have water most of the time. There is a 4th pond just on the east edge of the Foundations property, that is likely intermittent and does not have fish. Some of the streams on the Foundation property are likely intermittent streams. We wish for 3 of these ponds – that have or may have fish, to have a use attainability analysis. We wish for base line testing of water quality of all the surface waters to be done prior to construction of the shooting range -- we think you need to do this ASAP. We want a monitoring program for 2 or 3 of the ponds on or very near the property to be planned and for you to watch for lead, TDS, TSS and sediment --- so as to watch over the shooting ranges pollution discharges.

We are concerned that Antelope Creek is not listed as a tributary of Elk Creek.
https://sdlegislature.gov/Rules/Administrative/28380

We believe it has sections that are perennial and intermittent in this area. We believe it has sections that have fish in it. The proposed north unit of the proposed Shooting Complex will drain to Antelope Creek. We wish a use attainability analysis for it, to determine it's correct beneficial use and for base line testing of water quality to be done prior to construction of the shooting range -- we think you need to do this ASAP. We wish a monitoring program for it to be planned to watch for lead, TDS, TSS and sediment --- so as to watch over the shooting ranges pollution discharges.

We are concerned that Elk Creek is not monitored in this area. We wish for base line testing of it and a monitoring program for it to be planned to watch for lead, TDS, TSS and sediment --- so as to watch over the shooting ranges pollution discharges.

I will ask for local folk with more understanding of waters in the area to contact you and describe the waters
and the fish.



Here is a link to the draft EA by SD GFP done under the supervision of the USFWS. We find it totally inadequate and will be commenting on it.
https://fws.gov/library/collections/wsfr-rapid-city-south-dakota-proposed-shooting-range
https://fws.gov/media/rapid-city-shooting-range-initial-environmental-assessment

We care about lead, but also about TSS, TDS and sediment, with questions on how well reclamation can happen of large amount of disturbed ground in valleys, where clay soils will make grass recovery difficult and lead reclamation may require frequent removal of grass for lead mining and perhaps washing of the bullets out of the clay..

B. GOLD MINING THREAT TO BLACK HILLS

We refer you to the Black Hills Clean Water Alliance's web pages on gold mining threats for three mines. These web pages have maps of the claims of the three companies. It is our experience based on years of checking, that DANR & SDGFP don't do a good job of UAA on small flow streams in the Black Hills. Many of these small streams support small fish, which are not of fishing size & thus are ignored in fisheries inventories. We hope you will check the small/low flow streams for fish in areas threatened by mines, to be sure their beneficial use is correct before mining starts.

Dakota Territory-
https://bhcleanwateralliance.wordpress.com/gold/2/?preview_id=1628&preview_nonce=9b2b20c706&preview=true,
F3 Gold
https://bhcleanwateralliance.wordpress.com/gold/3/?preview_id=1628&preview_nonce=9b2b20c706&preview=true
Mineral Mountain
https://bhcleanwateralliance.wordpress.com/gold/4/?preview_id=1628&preview_nonce=9b2b20c706&preview=true

Thanks,

Nancy Hilding

DANR Response to Prairie Hills Audubon Society Comments:

DANR Response A. Thank you for your comments. DANR will consider your requests.

DANR Response B. ARSD 74:51:01:02.01 requires that a beneficial use analysis (use attainability analysis (UAA)) be conducted before renewing an existing or issuing a new individual surface water discharge permit (under Article 74:52) on any water that only has the (9) Fish and wildlife propagation, recreation, and stock watering waters use classification. Based on this requirement, DANR will conduct a UAA to any waterbody that only has the 9 use, including the gold mining projects mentioned in your comment letter, before an individual discharge permit is issued. The UAA would determine appropriate and existing beneficial use designations and associated water quality criterion.

EAST DAKOTA
WATER
DEVELOPMENT
DISTRICT

March 6, 2022

Joshua Strobel
SD DANR - Watershed Protection Program
523 East Capitol Avenue
Pierre, South Dakota 57501-3181

Dear Mr. Strobel:

I am writing to offer comments on behalf of the East Dakota Water Development District on the DRAFT 2022 South Dakota Integrated Report for Surface Water Quality Assessment (DRAFT IR). For each I have included a page reference from the DRAFT document.

1. Page 58. The second paragraph talks about mercury in fish flesh in Big Sioux River basin water bodies. While it does a decent job of explaining what the problem is, it doesn't do as good a job at providing context. It notes that 35 lakes in the watershed have been monitored during this period, but doesn't mention the total number of lakes listed (45)in the report. 35 lakes represent just under 78%, which isn't bad. Similarly, while noting that 3 river/stream segments were monitored, it leaves out the fact that there are 34 altogether, which means that less than 10% have been evaluated (not great).

2. Page 61. Scant mention of mercury in fish flesh is made in the general discussion of the Minnesota River basin water bodies. Appendix C shows that only 2 of the 11 lakes were monitored, and none of the 10 river/stream segments.

3. Page 64. No mention of mercury in fish flesh is made in the general discussion of the Red River basin water bodies. Appendix C shows that neither of the 2 lakes were monitored. (There were no river/stream segments assessed in this basin.)

4. Page 64. No mention of mercury in fish flesh is made in the general discussion of the Minnesota River basin water bodies, although Appendix C shows that 6 of 10 lakes were monitored, and 4 are impaired for Hg. None of the 6 river/stream segments were apparently monitored.

5. Page 71. The legislation referenced in the first paragraph, **House Bill 1009**, An Act to repeal the authority of the Department of Environment and Natural Resources to regulate public swimming places and bulk water haulers, was passed in the 2011 legislative session. Further, while it is certainly true that the Legislature passed the bill, the legislation was brought forward at the request of the Department of Environment and Natural Resources, something that should be noted when discussing this action.

6. Page 71. The text in the section describing Fish Flesh Contaminants describes the difference between the two established standards for mercury in South Dakota. Under the oversight of the Department of Health,

a fish consumption advisory is issued if total mercury is present in excess of 1.0 mg/kg in fish tissue. However, the Department has established a lower threshold (0.3 mg/kg) when considering whether or not surface water quality is acceptable.

For the general public, I would suspect that these differences create an unsettling contradiction. If a water body is considered impaired as a result of the amount of mercury in fish flesh, then why would it not also be considered unsuitable for consumption? It would seem appropriate for the two respective executive branch agencies to resolve this conflict in advance of the next iteration of this report.

7. Page 72. In the first paragraph, and associated tables, it is noted that several water bodies are considered impaired with regard to their use as a Domestic Water Supply, including segment 10 of the Big Sioux River (SD-BS-R-BIG_SIOUX_10). For four of these, mention is made that they are either not currently used as such, or only on a limited basis. However, no explanation of why the others are listed, nor is there a discussion of the cause(s). To my recollection, none of the Big Sioux River segments for which Domestic Water Supply is applicable have ever been considered impaired for this beneficial use. As the intake currently being used by the City of Sioux Falls lies within this segment, further information is warranted.

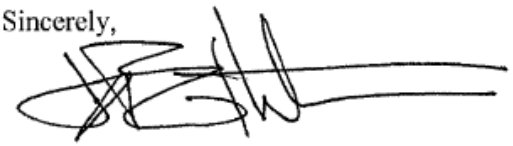
8. Appendix C, Pages 112 - 116. There is no mention of the parameter ECOLI for any of the following lakes, although each is listed as either FULL or NON support status fora Immersion and Limited Contact Recreation: Dry Lake, Enemy Swim lake, Goldsmith Lake, Lake Madison, School Lake and Waubay Lake in the Big Sioux River Basin. As ECOLI is the primary metric against which these particular uses are assessed, this is problematic.

   Similar problems(?) were noted for Big Stone Lake and the upper segment of the Little Minnesota River in the Minnesota River Basin (pages 150-152); White Lake in the Red River Basin (page 154); and Lake Henry, Lake Thompson, Whitewood Lake and the upper segment of the East Fork of the Vermillion River in the Vermillion River Basin (pages 155-157).

Finally, I will raise a recurring issue regarding information about mercury in fish flesh, and the support status of the various listed water bodies. Mercury in fish tissue data is available for only a limited number of water bodies. My continuing concern is that anyone looking over Appendix C with regard to the Big Sioux River would conclude that a segment is problematic, all remaining sections are ok. What we actually is that segment 7 is impaired, segments 8 & 14 are ok(?), and we **don't know** the status of the rest of the river. The presentation of this critical information needs to be amended in such a way as to reflect what is actually known.

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.

Sincerely,



Jay P. Gilbertson
Manager/Treasurer

DANR Response to East Dakota Water Development District Comments:

DANR Response 1-4. As explicitly stated on page 71, DANR collaborates with DOH and GFP on which waters to sample for mercury in fish tissue. Waterbodies are targeted and prioritized based on fishing pressure, public access, and viability of the fishery. GFP samples waterbodies for mercury in fish tissue in conjunction with GFP scheduled population surveys. The river reaches that have been sampled for mercury in fish tissue tend to have greater public access and greater fishing pressure; therefore, have a greater priority over other river reaches that have not yet been sampled. This concern is duly noted and DANR, GFP, and DOH are making a deliberate effort to collect more mercury in fish tissue on rivers and streams even outside of GFP population surveys. However, fish collection efforts and laboratory costs require considerable resources and sampling 100% of South Dakota waters is not achievable.

The purpose of the basin assessment summaries is to provide general information about the basin. It is not intended to discuss all sampling parameters or projects and is not intended to discuss all parameters that have not been monitored. For detailed information on the parameters that have been sampled, please refer to the individual waterbodies in Appendix C. The table clearly includes parameters that have been sampled and do not meet the criterion along with parameters that have been sampled and do meet the criterion. It is clearly stated on page 53 that DANR does not sample all waterbodies for all possible contaminants and if a parameter is not included in either the cause or meeting parameter column, then the waterbody was not sampled or has insufficient data for that parameter. The sentence on page 53 has been amended to clarify that in that situation the status is unknown. Additionally, DANR agrees that information presentation is important and has continued to update Appendix C with meaningful information. DANR disagrees with the comment that the public do not understand Appendix C.

DANR Response 5. The paragraph has been updated to remove historical information in order to focus on how DANR uses beach closure data and information for the IR.

DANR Response 6. The DOH is regulated under the oversight of the FDA. DANR is regulated under the oversight of EPA. The EPA and the FDA have differing opinions on mercury in fish tissue thresholds. DANR's (and EPA's) mercury in fish tissue criterion is a water quality criterion used to determine if the beneficial use is met. The FDA threshold is used for consumption advice for the public. These are two different thresholds that have differing purposes in their application. DANR will report on the status of waters meeting beneficial uses and DOH will provide public health advice. DOH has not issued any "do not eat" advisories. Therefore, the comment about waters being "unsuitable for consumption" is unfounded and not supported by information released by DANR or DOH.

DANR Response 7. A statement has been added to page 72 to acknowledge that the Big Sioux River, along with others are currently in use as a source water for a public water supply system. Table 25 includes the cause of nonsupport in the Big Sioux River for the domestic water supply use. Additional information as to the source of the impairment and/or reasons for exceeding water quality criterion will be investigated in future TMDL development.

DANR Response 8. Thank you for your comment. DANR realized that *E. coli* was assessed fully on all these lakes, but the *E. coli* parameter was not added to the Basin Tables and some also needed to be entered in ATTAINS. No overall support changes were made with these additions (Appendix C). Appendix C basin tables and ATTAINS have been updated to reflect that *E. coli* was assessed.

Jay Gilbertson of East Dakota Water Development District called DANR on March 15th and noted that Lake Kampeska was INS for beneficial uses 7 and 8 in the basin table for E. Coli. DANR realized that this was a mistake and updated appendix C and all associated tables in the integrated report, accordingly. ATTAINS was also updated to reflect this change.

Benjamin J. Maas, Ph.D.
Hydrogeochemist
Email: bmaasmn@gmail.com

March 5, 2022

South Dakota Department of Department of Agriculture and Natural Resources
Attn: **Comments on Waterbody Report and National 303(d) Program Vision**
Watershed Protection Program
523 East Capitol Avenue – Joe Foss Building
Pierre, South Dakota 57501-3181
Email: Joshua.Strobel@state.sd.us

Re: **Waterbody Report and National 303(d) Program Vision**

Dear Watershed Protection Program

I am writing to offer the following comments on the draft 2022 Integrated Report for Surface Water Quality Assessment (Integrated Report) for the state of South Dakota. My comments can be broken down into a four categories 1) Insufficient collection of data, 2) misrepresentation of the cause of pollution, 3) inadequate public education and outreach, and 4) sparce TMDLs.

Insufficient collection of data

Throughout the report it was abundantly clear that not enough data were collected during the last five yearx to provide an accurate picture of the condition of South Dakota's surface waters. During the last five years, October 2016 through September 2021, only about 6% of the total stream milage, perennial, intermittent, and ephemeral, were assessed. Of the 6% of streams that were assessed, approximately 22% of the 5,888 stream length were found to support their assigned beneficial uses.

In the report, it was stated that 90% of stream miles are either intermittent or ephemeral streams, and though these streams were once thought to be unimportant for habitat and downstream water quality, they are now known to be very important. As this is the case, then why aren't intermittent or ephemeral streams being assessed? The SD DANR was awarded a grant in 2006 – 20101 to conduct sampling but largely nothing came from it, other than a couple of publications.

A similar story of a lack of data collection was presented for the lakes and reservoirs, where of the 584 lakes and reservoirs with "specific aquatic life and recreational beneficial use classifications" only 176 were assessed during the five-year period. Of the lakes and reservoirs that were assessed, only 29.6% of the assessed acreage (145,009 acres assessed) were considered to support the assigned beneficial use. Given the importance of recreation and tourism to the state of South Dakota, it would be prudent to increase the number of rivers miles and lake and reservoir acreage assessed. The current stated goal of the DANR to sample a minimum of 35 lakes a year three times a year. Sampling such a low number of lakes a year is not a great plan, and an effort should be made to increase the number of lakes and reservoirs that are assessed.

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As demonstrated by the success of such groups as Friends of the Fire Steel and Friends of the Big Sioux River, it has been shown that there are groups that will help the DANR collect water samples. Private citizens, such as myself, are also willing to help collect water samples to help fill in the numerous gaps in the DANR's dataset. However, information on how to help collect samples and where to drop them off is difficult to find unless you have a contact in the DANR. Additionally, dropping off the samples is difficult and plague with issues that can result in delays processing the samples, which can impact the reliability of the data. **Therefore, it is my opinion that South Dakota should increase the number of stream miles and lake and reservoir acreage that are assessed for water quality data Increasing the numbers of samples collected can be done by partnering with organizations and private citizens. The SD DANR should also adequately staff its departments so that it can collect enough water samples to get a clear picture of the condition of South Dakota's surface waters.**

Misrepresentation of the cause of pollution

Numerous times the impact that human activities, especially agriculture, have on the surface waters of South Dakota were downplayed. With few exceptions, the report gave little to no mention that the reason for the TSS, *E. coli*, and chlorophyll-a issues in many streams, lakes, and reservoirs is primarily a direct result of agricultural activities. Instead, the report tried to frame the source of the water pollution on "natural sources", which has a much smaller contribution than that of human activities[1,2]. Agricultural activities result in excessive erosion, which occurs at a rate significantly greater than that of natural erosion[1]. While it is true that wetter conditions can result in greater numbers of *E. coli* in the water, the ultimate source of that *E. coli* is from agriculture[2]. Chlorophyll-a concentrations in many South Dakota waters are elevated due to excess nutrients, in the form of manure and artificial fertilizer, that are applied to fields. As stated later in the report, the primary reason for these sources of pollution are nonpoint source, NPS, pollution, and while not regulated steps can be taken to lessen the amount of NPS pollution.

Atmospheric deposition of mercury in South Dakota's waters was highlighted, but ways to mitigate its impacts on the environment and people were not. Mercury bioaccumulates in aquatic ecosystems[3]. So, the longer that atmospheric deposition occurs, the worse the pollution is going to get. Because so many of South Dakota's lakes are impacted by mercury and a primary source of mercury is from coal fired power plants, working to reduce coal use would help improve water quality. But no plan was given as to how mercury from atmospheric deposition was given.

In a recent story from the Mitchell Republic[4], two environmental scientists that worked on this report tried to downplay how polluted South Dakota's waters are. "I certainly would rate [the quality of South Dakota's lakes] higher than what the report is showing," Lorenzen said. "I think South Dakota's waters definitely provide good fisheries and good opportunities for recreational activities." Trying to downplay what the data indicates, is both dangerous and misleading. The

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public deserves better than being lied to, especially when our safety is at risk. **It is my opinion that steps should be taken to more accurately explain the reasons for the water pollution in South Dakota. Misrepresentation of the data is not helpful and will only hinder improving South Dakota's waters. Waters which are a drinking source for many residents of the state and are used by residents and tourists for recreational activities.**

Inadequate Public Education and Outreach

In the report, it is stated "the CWA [Clean Water Act] provides an opportunity to more effectively restore and protect South Dakota's waters by using systematic process of prioritizing TMDL development and implementing alternative approaches and protection activities" The last meeting, at least according to the report, about NPS was 2015. Surely another meeting could have been held since then.

It is also stated that NPS pollution is unregulated as agricultural activities are exempt from most of the provisions of the Clean Water Act. Furthermore, it is stated that the technical and financial assistance currently available is not sufficient to solve all NPS pollution issues in the state, and that landowners need to understand the nonpoint source issues and how their activities contribute to NPS pollution. However, no information was provided as to how landowners will be educated about NPS pollution and it was not mentioned how pollution from NPS pollution will be mitigated. This I feel was a missed opportunity to begin addressing NPS pollution, which is severely needed. Numerous conservation organizations are working hard to decrease pollution from NPS sources. Providing information on how to reach out to these organizations would have been helpful.

Very little information is made available about the state of South Dakota's waters through social media or news released. Even in this report, the reader had to put in the work to get to the websites where the data are presented, and had to follow multiple links to get the data. This practice of trying to hide data, or at least make the reader work for the data, is dangerous to the health of the public. I**t is my opinion that the SD DANR should make efforts to hire enough staff so that they can educate the public on the condition of South Dakota's water. This can be accomplished through the use of social media, holding regular public meeting, and providing accurate news releases in order to fully and accurately educate the public on the condition of South Dakota's surface waters.**

Sparce Total Maximum Daily Loads (TMDLs)

The number of rivers, lakes, and reservoirs that either need a TMDL developed or do not have enough data to develop a TMDL is appalling. Per the report, 95 streams or stream segments were listed as impaired requiring TMDL development. An astonishing 84 lakes do not support water quality standards for their assigned use and are on the 303(d) impaired waterbodies list, which requires TMDL development. Only 58 of the aforementioned 179 waters provided in the report

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are planned to have a TMDL established for the 2022 cycle. There was no mention of a plan to develop a TMDL for the countless number of streams that do not have enough data to be assessed.

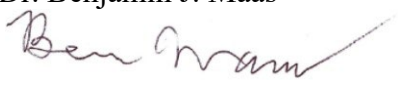
According to the report, most of the river miles in the James River Basin and the Big Sioux River Basin either do not have an approve TMDL or there is insufficient data to create a TMDL. In both basins, there is no real mention of either a goal to establish a TMDL or to establish projects to improve water quality. A plan for the Big Sioux River Basin might be in the works, but such a plan was not mentioned. There was a brief discussion on planned projects to improve water quality, but no real goals or timeline to improve the water quality were given. A similar story was presented for the James River Basin. There are some efforts being planned to improve the water quality of the James River Basin[5]. No mention of these plans to improve water quality were given in the report. As both basins have low oxygen concentration and elevated *E. coli* values, a direct result of agricultural activities in both basins, reducing NPS pollution would be a prudent course of action. **Therefore, it is my opinion that efforts should be made to create more TMDLs for a greater number of South Dakota's surface waters. Additionally, steps should be taken to reduce the larger number of river miles and lakes and reservoir acreage that do not have a TMDL due to insufficient data. The SD DANR can partner with the aforementioned grassroot organizations and private citizens to accomplish this goal.**

In Closing, the stated goals of South Dakota 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 intended uses." By every metric, you have not met these goals as more than 70% of assessed waters do not meet your own standards. What is being done to fix the problems? Other than a few token statements, little evidence was provided to suggest that the State of South Dakota is taking meaningful steps to improve its water quality. But you do not need to try and tackle the water pollution and lack of data on your own. Many private citizens, such as myself, and grassroot organizations are willing to help collect data and improve South Dakota's waters through community events and out individual efforts.

Thank you for the opportunity to comment on the important topic of South Dakota's water quality and on the draft 2022 Integrated Report for Surface Water Quality Assessment (Integrated Report). If you have any comments or questions on the comments that were provided, please feel free to contact me.

Sincerely,

Dr. Benjamin J. Maas



References and Supporting Information

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2. Brendel C, Soupir ML. Relating Watershed Characteristics to Elevated Stream *Escherichia coli* Levels in Agriculturally Dominated Landscapes: An Iowa CaseStudy. *Water*. 2017; 9(3):154. https://doi.org/10.3390/w9030154
3. Krabbenhoft, D.P., Rickert, D.A., Mercury Contamination of Aquatic Ecosystems, U.S.Geological Survey Fact Sheet, Version 1, Fact Sheet 216-95, https://pubs.usgs.gov/fs/1995/fs216-95/ .
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5. Fosness, S., City's wetland design near complete, as project to improve Lake Mitchell inches closer to construction, 9/02/2021, https://www.mitchellrepublic.com/news/citys-wetland-design-near-complete-as-project-to-improve-lake-mitchell-inches-closer-to- construction

DANR Response to Benjamin Maas Comments:

1. Insufficient Collection of Data

DANR Response:

DANR agrees that lake and stream water quality monitoring is limited to a portion of the total waters in the state. DANR relies on federal, state and local resources and partnerships including volunteers to accomplish the current level of water quality monitoring. DANR and partners focus available resources on waters with the greatest public importance, which includes perennial and intermittent streams. It is impractical to increase resources to the level necessary to sample all waters in the state at a frequency required to make water quality-based decisions. The state-scale statistical survey section on page 46 describes an alternate approach for determining water quality condition of the larger population of lakes and streams in the state.

DANR and partners do sample a majority of the more significant perennial and intermittent waters in the state (refer to Figure 5). Pages 8-13 provide descriptions of the types of surface water assessments that are conducted statewide. In addition, page 4 discusses data collected and submitted by outside organizations. During the 5-year stream assessment period, thousands of water samples were collected at hundreds of monitoring sites statewide. DANR agrees that intermittent and ephemeral streams are important; however, flow and water presence can be limited to hours, days, or weeks. Water must be present in a waterbody to collect a sample and determine if criterion are met and uses attained. Most of South Dakota's intermittent-ephemeral streams are dry draws and washes that flow temporarily during precipitation events. Many of the streams in Category 3 (insufficient data) are due to a lack of water presence. Best management practices established during watershed-scale NPS implementation projects are often implemented on intermittent or ephemeral streams to protect downstream uses of impaired waters.

DANR focuses lake sampling on those waterbodies that are publicly owned. A majority of the 584 are located on private land requiring landowner permission and access coordination. Lake sampling is conducted 3 times during the growing season over multiple years to meet or exceed minimum data requirements to ensure a robust support or impairment assessment.

DANR agrees that recruiting more volunteer monitors increases water quality assessment capacity in the state. Current efforts from volunteer monitoring groups have proven beneficial to filling water quality monitoring gaps. Volunteer monitoring groups and individual citizens are required to follow strict quality assurance plans and protocols to ensure the collection of high quality data useful for a host of applications. This requires staff resources to provide training and coordination. Refer to the following weblink to learn more about the Volunteer Monitoring Project https://danr.sd.gov/Conservation/WatershedProtection/VolunteerActivities.aspx.

2. Misrepresentation of the cause of pollution

DANR Response:

A comprehensive source assessment is not provided in this water quality report. Sources of impairment can vary by waterbody depending on watershed characteristics and land use practices. The terms NPS pollution and Natural are used to describe the general source of impairment in reference to cause parameters (i.e., E. coli-Chlorophyll-a etc.) for the population of assessed waters. The sentence at the top of page 43 of the draft report states, "Runoff carrying sediment and nutrients from agricultural land is the major nonpoint pollution source." Subsequent references to agricultural nonpoint sources of pollution are mentioned throughout the document. TMDL development is used as the primary forum to accurately depict the source(s) of impairment for individual waterbodies.

https://danr.sd.gov/Conservation/WatershedProtection/TMDL/Assessment.aspx.

The primary source of mercury in South Dakota waters comes from global atmospheric deposition. The statewide mercury TMDL (referenced in the report) provides a definitive source assessment. Results clearly indicate that there are no single sources of mercury within the state that contribute significantly to deposition in South Dakota. In fact, model results indicate the three largest emitters of divalent gaseous mercury within the state combined to account for only 0.01% of the total deposition. Therefore, mitigation efforts in South Dakota would have little to no impact on overall deposition. Refer to the statewide mercury TMDL for facts concerning mercury deposition in South Dakota.
https://danr.sd.gov/Conservation/WatershedProtection/TMDL/docs/TableDocs/tmdl_statewidemercury.pdf.

Results of the report indicate a high percentage of assessed lakes and streams do not support one or more beneficial uses and are considered impaired. The terms nonsupport or impairment may imply that these waters offer no value in terms of public use (i.e., fishing, wading, boating, swimming etc.). Nonsupport or impairment indicates that one or more water quality parameters exceed standards assigned to protect the designated use(s) in accordance with the listing methods. In many cases, nonsupport is based on a single parameter, while many other parameters meet standards (Appendix C). A TMDL serves as a planning document to address the water quality parameter(s) of concern and determine measures necessary to achieve water quality standard attainment. The report structure, processes and terminology are based on federal Clean Water Act requirements and EPA guidance.

Mr. Lorenzen's comment was not intended to mislead or downplay the results of the assessment, but rather to provide perspective outside the context of the report. Many of the lakes considered non supporting or impaired are some of the best game fish fisheries in the state. Many of these lakes also provide recreational opportunities. In addition, many streams contain diverse prairie stream fish communities including the federally endangered Topeka Shiner. This observation was based on over 25 years of experience conducting field assessments on lakes and streams across the state. It is also based on 18 years of experience as an IR team member responsible for preparing various sections of the report.

During the interview process for the referenced article, the aforementioned environmental scientists also discussed implications of nonsupport with regards to human health parameters and measures being taken to improve and protect water quality. An explanation was provided to interpret human health standards, in particular *E. coli*, to provide the readers with a sense of perspective when weighing risk. It was explained that standards for human health are designed to be protective. South Dakota's standard for immersion recreation waters was adopted from EPA national criteria. The standard is based on eight in one thousand people experiencing illness based on several epidemiological studies. Discussing the intricate details associated with each water quality standard is outside the scope of the report. Many of the NPS programs and partnerships documented in the report were also discussed to depict the level of effort being expended to improve and protect water quality.

3. Inadequate Public Education and Outreach

DANR Response:

The 2015 meeting was held to introduce stakeholders to the concepts described in South Dakota's 303(d) Vision. The subsequent IR reports (2016, 2018, 2020, and 2022) and associated public comment process provided the forum to document and communicate progress. Consideration will be given to providing more avenues to engage stakeholders in the next 303(d) Vision cycle which is currently in the planning phase.

The report provides a basic over-view of the programs and activities in place to combat NPS pollution. Refer to the Watershed Protection Program website for a more comprehensive review of the processes used to address NPS pollution. https://danr.sd.gov/Conservation/WatershedProtection/default.aspx. Consideration will be given to strengthening the NPS pollution section during the 2024 reporting cycle to address your concerns.

DANR's website provides the best avenue to gain up to date information for all services the department provides including content related to condition. DANR intentionally provides links to pertinent information where available to avoid duplication of effort. The intent is not to hide information but rather to encourage readers to use the website as a resource to obtain desired content. Consideration will be given to increase the use of other avenues to make information more available to the public.

4. Sparse Total Maximum Daily Loads (TMDLs)

DANR Response:

DANR's TMDL priorities are documented in South Dakota's Long-Term Vision Strategy section. As stated in this section, "South Dakota is on pace to complete the Vision priority TMDLs by September 30, 2022." As mentioned in a previous response, DANR is currently in the planning phase for developing the next long-term Vision priorities. The new TMDL priority schedule and other approaches will be documented in the 2024 IR. TMDL development can be rather complex, challenging, and time consuming. On average, standard TMDLs (E. coli-TSS) can take one to two years to complete and receive EPA approval. Depending on specific challenges, some TMDLs can take many years to complete. Delays are not necessarily related to data availability and/or staffing.

Several watershed or basin scale projects have been initiated to address NPS pollution and improve or protect water quality despite lack of a TMDL. In other words, TMDL development does not hold up progress when it comes implementing projects aimed at meeting water quality goals. The Big Sioux River Basin and James River Basin descriptions on pages 58 and 61, respectively, provide general descriptions for NPS implementation projects being conducted. More information about NPS implementation projects is available on DANRs Watershed Protection Program webpage https://danr.sd.gov/Conservation/WatershedProtection/default.aspx.

Closing

DANR's water quality monitoring and pollution control programs involve a variety of organizations and partnerships with the common goal of meeting water quality goals using available resources. DANR and partners continually strive to refine and improve water quality programs. Your suggestions for improvement will be taken into consideration. DANR recommends using weblinks provided throughout the report to gain more information and knowledge regarding what is being done to meet water quality goals and how private citizens can get involved. If you have any questions regarding responses to your comments or would like to discuss water quality concerns, please contact the department at DANRMail@state.sd.us.

Technical Memorandum

False Bottom Creek, 303(d) Listing for Selenium

GEI Consultants, Inc. (GEI), on behalf of Wharf Resources (USA), Inc. (Wharf) submits the following comments regarding the 2022 listing of a portion of False Bottom Creek as impaired pursuant to Section 303(d) of the Clean Water Act. The South Dakota Department of Agriculture & Natural Resources (DANR) encourages public comment on *The 2022 South Dakota Integrated Report for Surface Water Quality Assessment* (2022 Integrated Report) due March 6, 2022. GEI appreciates the opportunity to provide additional technical information to be considered in DANR's final water quality assessment determination for False Bottom Creek.

Background False Bottom Creek

The headwaters of False Bottom Creek are located 3.3 miles northwest of Lead, South Dakota, and flows north where it enters the Redwater River, and eventually the Belle Fourche River, near Belle Fourche, South Dakota. Since 1995, Wharf has performed water quality and biological monitoring in False Bottom Creek which is identified as SD-BF-R-FALSE_BOTTOM_02 for assessment purposes (pg. 107, 2022 Integrated Report). This segment of False Bottom Creek is classified for the standard beneficial uses—irrigation, fish and wildlife propagation, recreation, and stock watering waters, with the addition of coldwater marginal fish life propagation and limited-contact recreation waters (ARSD §, Chapter 74:51:03:10).

Several historic mine sites are located upstream of the current monitoring sites, including the historic Bald Mountain Mill and tailings. The mill was dismantled, and the surface of the tailings reclaimed in 1993. After the approval of the Wharf Resources Expansion Permits in 1998 and 2012, a portion of the tailings were covered with additional barren rock from the active Wharf Mine. Concurrent reclamation has been occurring on this placed barren rock since the early 2000's. The headwaters of False Bottom Creek currently originate from a groundwater spring (False Bottom Spring) approximately 450 feet downgradient from the lower Trojan Rock Facility. It is noted that topographical maps from the early 1900's prior to the Bald Mountain Mill and tailings impoundment construction appear to indicate spring or ephemeral flow further up the drainage from the current False Bottom Spring surface expression.

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Regulatory Determination

Based on selenium water quality data collected near False Bottom Spring, DANR listed False Bottom Creek (SD-BF-R-FALSE_BOTTOM_02) as in "nonsupport" of the coldwater marginal fish life propagation and fish and wildlife propagation, recreation, and stock watering uses (pg. 107, Appendix C, 305(b) Belle Fourche River Basin Table, 2022 Integrated Report) and recommended a Category 5 impairment with a "low" priority total maximum daily load (TMDL) to be developed (pg. 160, Appendix D, 303(d) Summary Table, 2022 Integrated Report).

Comments

Even though a brief narrative was provided in the 2022 Integrated Report describing the regulatory determination for False Bottom Creek, it would be beneficial to report the assessment metrics (e.g. sample size, central tendency, magnitude, and exceedance frequency) that led the DANR to conclude impairment. This would help the stakeholders to better understand the assessment methodology and provide transparency in the regulatory listing.

We agree with DANR's findings that total selenium concentrations in False Bottom Creek (SD-BF-R-FALSE_BOTTOM_02) exceed the existing chronic (criterion continuous concentration, CCC) standard of 5.0 µg/L (ARSD § 74:51:01). However, we are concerned with the presumptive determination that the coldwater marginal fish life propagation and fish and wildlife propagation, recreation, and stock watering uses are "impaired" when the current science on selenium toxicity indicates that the most sensitive species (i.e., fish) are being protected when site-specific data is considered. The U.S. Environmental Protection Agency's (EPA) guidance for implementing the most up-to-date selenium criterion emphasizes the use of fish tissue concentrations over water quality concentrations (EPA 2016). And, as explained below, fish tissues in False Bottom Creek are in attainment of the EPA 2016 criteria. Furthermore, recent studies have shown that elevated sulfate concentrations reduce the effects of selenium toxicity in fish (DeForest et al. 2017). The sulfate concentrations in False Bottom Creek are sufficient to ameliorate the effects of selenium toxicity in fish.

Recommendation

We recommend that False Bottom Creek remain on the 303(d) list given the current total selenium concentrations originating from the groundwater at False Bottom Springs. However, we strongly encourage DANR to change the EPA categorical listing to Category 2. This would allow DANR and Wharf to collect additional aquatic life use data to further evaluate whether the most sensitive use—coldwater marginal fish life propagation—in False Bottom Creek (SD-BF-R-FALSE_BOTTOM_02) is being protected despite the elevated total selenium concentrations emanating from the groundwater spring, and whether more appropriate standards should apply to the waterbody.

Unintended Consequences

If the listing of False Bottom Creek remains as a Category 5 priority, and requires the development of a TMDL even though it is a low priority, the listing may have unintended environmental consequences on aquatic life use in False Bottom Creek. A Category 5 listing would become a component of the surface water discharge permit, currently in revision, and likely require treatment to remove the selenium. Removal of selenium is challenging from a water quality standpoint with treatment options ranging from passive natural wetlands to physical-chemical treatment plants (Figure 1). Given the geophysical setting of the basin and property boundaries, treatment would likely require the pumping of groundwater out of the basin for treatment then discharge back into the basin to maintain stream flows. If the coldwater marginal fish life propagation use is being protected by other water quality characteristics (e.g., sulfate) that reduce the effects of selenium toxicity on fish, then treatment may be unnecessary and an unintended consequence of the listing.

Figure 1: Selenium treatment (Carollo 2018, North American Metals Council – Selenium Workgroup, June 2018 meeting, Vancouver, British Columbia).

Technical Background

GEI Consultants, Inc. (GEI) scientists are recognized experts in the effects of selenium on aquatic life. We have been working on selenium water quality regulatory issues for well over 25 years, and have served as invited experts for selenium risk evaluation in aquatic

environments for the Society of Environmental Toxicology and Chemistry. We have also provided technical review of selenium issues for the North American Metals Council – Selenium Working Group, as well as provided technical review of the U.S. Environmental Protection Agency's (EPA) various iterations of selenium criteria with the most recent 2021 Revision to Aquatic Life Ambient Water Quality Criterion for Selenium-Freshwater 2016 (EPA 2021). GEI has worked with multiple state agencies and stakeholders to help guide the implementation of the EPA 2016 fish tissue criterion into surface water regulations and discharge permits. GEI was instrumental in developing Kentucky's tissue-based criteria that was adopted prior to the EPA 2016 selenium criterion, and we have assisted Minnesota (site-specific) and Mississippi (site-specific) in the use of tissue-based criteria to evaluate reasonable potential in discharge permits. Other states that have fully adopted (statewide) the 2016 selenium criterion include Idaho, Nebraska, Tennessee; states partially adopting (site-specific) criterion include California and Montana; while California, North Dakota, Indiana, Vermont, and New Hampshire are proposing to adopt the 2016 selenium criterion on a statewide basis. As such, we believe we can provide a perspective on how the current understanding of selenium toxicity on aquatic life use may help guide the final regulatory determination for False Bottom Creek (SD-BF-R-FALSE_BOTTOM_02).

In August 2021, GEI collected whole-body Brook Trout (*Salvelinus fontinalis*) tissue samples from False Bottom Creek (SD-BF-R-FALSE_BOTTOM_02) for the analysis of percent solids and total selenium. The 2021 fish population survey showed the Brook Trout population contained multiple life-stages that is comparable to the long-term annual average population characteristics, with fish being selected for analysis representing the age-1 and age-2 class fish. The fish collected for tissue analysis experienced at least two years of environmental conditions in False Bottom Creek and were likely sexually mature in their second year. The selenium content ranged from 3.56 to 4.79 milligrams per kilogram dry weight (mg/kg, dw), with a geomean of 4.17 mg/kg, dw. This geomean whole-body tissue concentration is considerably less than the 8.5 mg/kg, dw EPA 2016 criterion value for whole-body fish tissue. This result indicates that selenium is present in the tissues, but not at the level that harms the fish or causes impairment to the uses—coldwater marginal fish life propagation, fish and wildlife propagation, recreation, and stock watering. The 2016 selenium criterion reflects the scientific community's understanding that selenium toxicity in aquatic life is predominantly based on the organism's diet and the trophic transfer of selenium through the food web rather than being exposed to selenium in the water column. Hence the hierarchy that the EPA 2016 tissue-based criterion will supersede water column criterion when steady-state fish tissue data exists.

As mentioned above, one mitigating factor that should be considered when evaluating the potential impairment due to selenium is the sulfate condition in False Bottom Creek. Elevated sulfate concentrations reduce selenium bioavailability at the base of the food web; thus less selenium is transferred up the food chain. DeForest et al. (2017) derived a sulfate-

dependent screening guideline for selenium to estimate a waterborne concentration that would elicit toxic effects in the most sensitive reproductive endpoint for fish (i.e., effects on egg/ovary tissues). Using the sulfate-dependent selenium screening relationship, the average sulfate concentration in False Bottom Creek (172 mg/L) would result in a selenium[1] screening concentration of 43 µg/L. In essence, water quality selenium concentrations less than 43 µg/L in False Bottom Creek would be protective of the most sensitive reproductive endpoint for fish (e.g., ovary/egg criterion concentration of 15.1 mg/kg, dw) or the whole-body tissue criterion value of 8.5 mg/kg, dw. The average selenium[2] concentration near False Bottom Spring is 10.1 µg/L (n = 46, data age 10/2016 to 9/30/2021) which is considerably less than the screening level.

Summary

In summary, our review of the whole-body fish tissue, fish population, and selenium data collected in from False Bottom Creek (SD-BF-R-FALSE_BOTTOM_02) shows there is no reasonable potential to exceed the EPA 2016 selenium criterion for whole-body fish, indicating the stream is, in fact, meeting its designated uses despite the water quality selenium concentrations that currently exceed South Dakota's selenium CCC.

We look forward to the opportunity to discuss the current scientific understanding of selenium toxicity with DANR and we encourage South Dakota to consider implementing the EPA 2016 criterion on a site-specific basis to evaluate the 303(d) listing or reasonable potential determination in surface water discharge permits.

Respectfully submitted,

Craig Wolf
Senior Aquatic Ecologist / Limnologist

Steven Canton
Reviewer, Emeritus Senior Ecologist

[1] Screening level is for dissolved selenate selenium
[2] Conservative estimate of total and total recoverable selenium is provided for comparison to the dissolved selenate selenium screening level.

References

DeForest, D.K., K.V. Brix, J.R. Elphick, C.J. Rickwood, A.M.H. deBruyn, L.M. Tear, G. Gilron, S.A. Hughes, and W.J. Adams. 2017. Lentic, lotic, and sulfate-dependent waterborne selenium screening guidelines for freshwater systems. Environmental Toxicology and Chemistry, 36(9):2503-2513.

South Dakota Department of Agriculture and Natural Resources (DANR). 2022. The 2022 South Dakota Integrated Report Surface Water Quality Assessment. Prepared by DANR.

United States Environmental Protection Agency (EPA). 2016. Aquatic life ambient water quality criterion for selenium – freshwater 2016. Office of Water, Office of Science and Technology, Washington D.C. EPA 822-R-16-006, June 2016.

United States Environmental Protection Agency (EPA). 2021. 2021 Revision* to: Aquatic life ambient water quality criterion for selenium – freshwater 2016. Office of Water, Office of Science and Technology, Washington D.C. EPA 822-R-21-006, August 2021.

DANR Response to GEI Comments:

Thank you for your comments and offering your expertise on the effects of selenium on aquatic life. DANR is aware of EPA's 2016 selenium water quality criterion and is actively considering the information for a possible future water quality standards revision. However, due to the implications with fish tissue sampling and the lower water quality criterion associated with 2016 criterion for surface water discharge permittees, DANR must consider these affects at a statewide level. DANR has not yet adopted EPA's 2016 selenium criterion and the 2004 criterion is what is approved under state law. For 305(b) and 303(d) purposes, DANR must use existing criterion that is approved under state law and the EPA. DANR's selenium criterion is applicable to the (2) Coldwater marginal fish life use and the (9) Fish and wildlife propagation, recreation, and stock watering waters use on False Bottom Creek.

Regarding comments on EPA Category, Category 5 is for waters that are not supporting water quality criterion and require TMDL development. Category 5 is the appropriate category for the selenium impairment on False Bottom Creek. Any water that is not supporting a water quality criterion (and doesn't already have an approved TMDL for the cause) is placed on the 303(d) list for TMDL development and subsequently defaults to EPA Category 5. EPA Category 2, as suggested in the comment letter, is only an appropriate category when some beneficial uses are met (full support for water quality criterion for those uses) and other uses have not been evaluated or have insufficient information. EPA Category 2 is not an appropriate category for False Bottom Creek because water samples do not meet the selenium water quality criterion.

EPA's emphasis of the use of fish tissue concentrations over water quality concentrations is only appropriate in a steady-state environment with stable selenium concentrations. Over the last few years, selenium has been slowly increasing at False Bottom Springs. With changing and increasing selenium concentration in the water, EPA's 2016 selenium guidance states that the fish tissue criterion is not applicable and that the water quality criterion is the appropriate criterion to use.