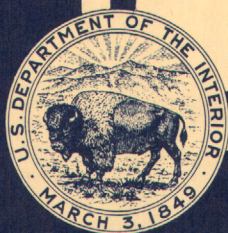
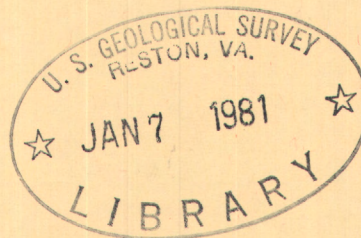


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Water Resources Data for South Dakota

Part 2. Water Quality Records



**UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

Prepared in cooperation with the State of South Dakota
and with other agencies

CALENDAR FOR WATER YEAR 1971

OCTOBER 1970

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

NOVEMBER 1970

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

DECEMBER 1970

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

JANUARY 1971

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

FEBRUARY 1971

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28						

MARCH 1971

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

APRIL 1971

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

MAY 1971

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

JUNE 1971

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

JULY 1971

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

AUGUST 1971

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

SEPTEMBER 1971

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

1971

Water Resources Data for South Dakota

Part 2. Water Quality Records



**UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY**

**Prepared in cooperation with the State of South Dakota
and with other agencies**

Prepared in cooperation with

South Dakota State Department of Health
East Dakota Conservancy Sub-District
Bureau of Reclamation, U.S. Department of the Interior
U.S. Environmental Protection Agency

Water resources records, 1971, for South Dakota are in the following reports of the U.S. Geological Survey:

1. Water Resources Data for South Dakota
Part 1. Surface Water Records
2. Water Resources Data for South Dakota
Part 2. Water Quality Records

Copies of this report may be obtained from
District Chief, Water Resources Division
U.S. Geological Survey
Room 231, Federal Building
P. O. Box 1412
Huron, South Dakota 57350

CONTENTS

	Page
List of water-quality stations, in downstream order, for which records are published.....	IV
Introduction.....	1
Cooperation.....	2
Definition of terms.....	2
Special networks and programs.....	8
Downstream order and station numbers.....	9
Collection and examination of data.....	10
Solute.....	11
Temperature.....	12
Sediment.....	12
Water-supply papers.....	13
Selected references.....	14
Water-quality records.....	16
Index.....	99

ILLUSTRATION

	Page
Figure 1. Map of South Dakota showing locations of water-quality stations, 1971 water year....	V

IV WATER-QUALITY STATIONS IN DOWNSTREAM ORDER,
FOR WHICH RECORDS ARE PUBLISHED

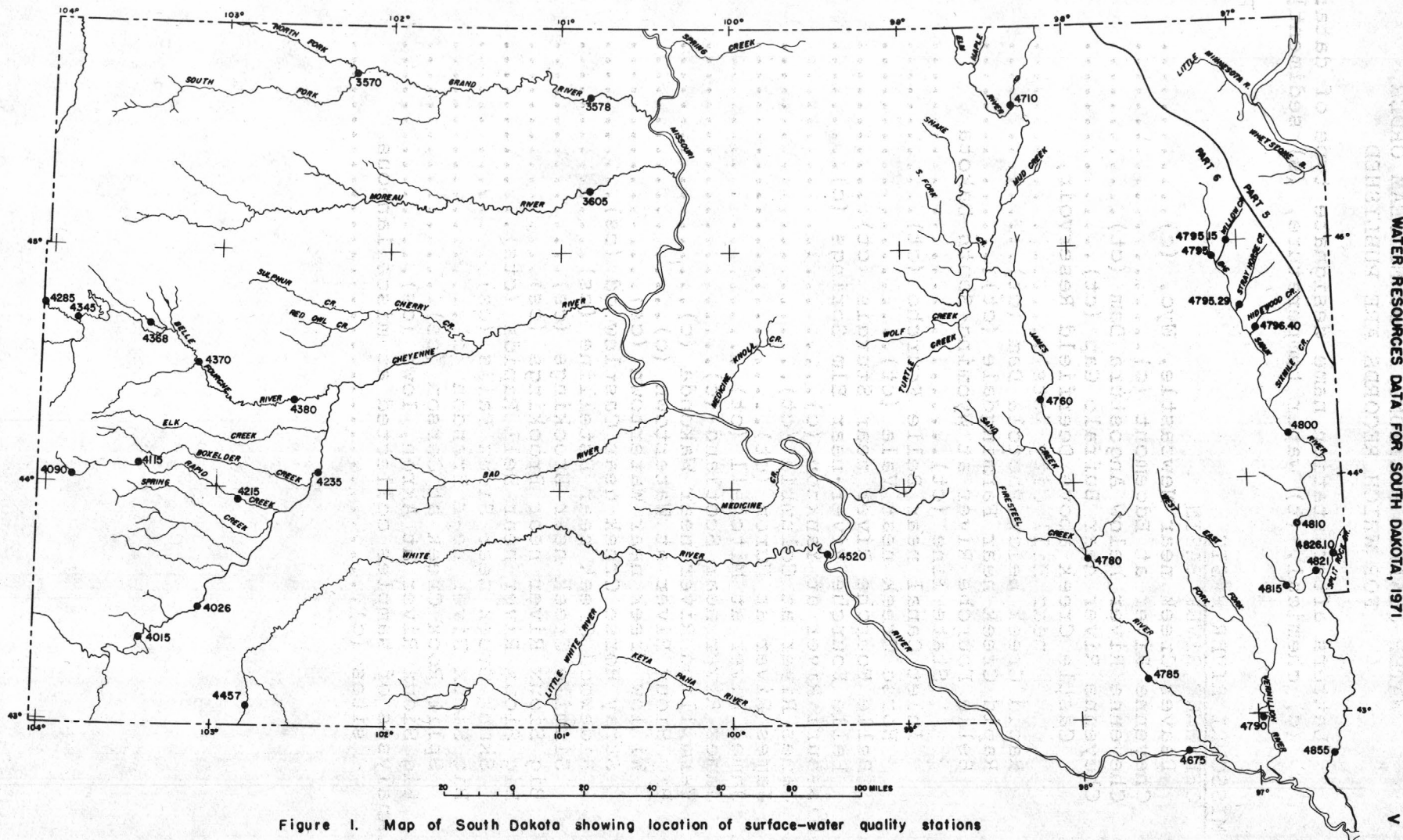
[Letters after station name designate type of data:
(c) chemical, (t) water temperature, (s) sediment]

Page

MISSOURI RIVER BASIN

CHEYENNE RIVER BASIN

Beaver Creek near Newcastle, Wyo. (c).....	16
Cheyenne River at Edgemont (c).....	17
Cheyenne River below Angostura Dam (ct).....	20
Cheyenne River near Buffalo Gap (ct).....	24
Castle Creek above Deerfield Reservoir, near Hill City (cts).....	28
Rapid Creek below Pactola Dam (ct).....	32
Rapid Creek near Farmingdale (ct).....	36
Belle Fourche River at Wyoming-South Dakota State line (ct).....	40
Inlet Canal near Belle Fourche (ct).....	44
Horse Creek near Vale (ct).....	48
Belle Fourche River near Sturgis (ct).....	52
Belle Fourche River near Elm Springs (c).....	56
Missouri River at Yankton (c).....	59
James River at Columbia (ct).....	60
James River at Huron (ct).....	64
James River at Mitchell (ct).....	68
James River near Scotland (c).....	72
Vermillion River near Wakonda (c).....	75
Big Sioux River at Watertown (c).....	76
Willow Creek near Watertown (cs).....	76
Stray Horse Creek near Castlewood (cs).....	77
Hidewood Creek near Estelline (cs).....	78
Sixmile Creek near Brookings (cs).....	79
Big Sioux River near Brookings (cs).....	80
Big Sioux River near Dell Rapids (cts).....	82
Skunk Creek near Sioux Falls (cs).....	88
Big Sioux River near Brandon (c).....	89
Split Rock Creek at Corson (cs).....	91
Big Sioux River at Akron, Iowa (cs).....	92
Analyses of samples collected at miscellaneous sites (c).....	94



WATER RESOURCES DATA FOR SOUTH DAKOTA, 1971

Part 2. Water Quality Records

by O. J. Larimer and N. F. Leibbrand

INTRODUCTION

Water resources data for the 1971 water year for South Dakota include records of data for the chemical and physical characteristics of surface water. Records for a few pertinent water-quality stations in bordering States are also included. These data represent that portion of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in South Dakota. The records were collected by the Water Resources Division of the U.S. Geological Survey under the direction of John E. Powell, District Chief. South Dakota district personnel who contributed significantly to the collection and preparation of data included in this report were: L. B. Yarger, J. Kume, J. H. Eade, H. L. Dixon, D. G. Adolphson, E. B. Hoffman, T. K. Lockner, L. G. Huber, R. C. Ugland, and E. M. Decker.

The Geological Survey has published records of chemical quality, suspended sediment, and water temperatures since 1941 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Beginning with the 1964 water year, water-quality records also have been released by the Geological Survey in annual reports on a State-boundary basis. Distribution of these reports is limited; they are designed primarily for rapid release of data shortly after the end of the water year to meet local needs. These records will be published later in Geological Survey water-supply papers.

COOPERATION

This report was prepared by the U.S. Geological Survey under cooperative agreement with the following organizations:

East Dakota Conservancy Sub-District, V. W. Butler,
manager-engineer.

Agencies furnishing assistance were:

Bureau of Reclamation, U.S. Department of the Interior.
Environmental Protection Agency, U.S. Department of
the Interior.

Funds for many stations were provided under the Missouri River Basin Development Program for collection of data to meet the needs of several agencies of the Department of the Interior.

DEFINITION OF TERMS

Terms related to water-quality and hydrologic data, as used in this report are defined as follows:

Acre-foot (AC-FT, ac-ft) is a quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons.

Bed material is the shifting portion of fragmented alluvial material of which the streambed is composed.

Biochemical oxygen demand (BOD) is the amount of oxygen required by bacteria while stabilizing decomposable organic matter under aerobic conditions.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, or about 646,000 gallons, and represents a runoff of approximately 0.0372 inches from 1 square mile.

Chemical oxygen demand (COD) indicates the quantity of oxidizable compounds in water and varies with water composition(s), temperature, period of contact, and other factors.

Coliform organisms are a group of bacteria used as an indicator of the sanitary quality of the water. The number of coliform colonies per 100 milliliters is determined by the immediate or delayed incubation membrane filter method.

Cubic foot per second (cfs, CFS) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute.

Discharge is the volume of water (or more broadly, total fluids), that passes a given point within a given period of time.

Mean discharge is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time. If this discharge is reported instead of the daily mean, the heading of the discharge column in the tables is "Discharge (cfs)."

Drainage area of a stream at a specified location is that area, measured in horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the river above the specified point.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or body of impounded surface water together with all tributary surface stream and bodies of impounded surface water.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is computed.

Hardness of water is a physical-chemical characteristic attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate (CaCO_3).

Methylene blue active substance (MBAS) is a measure of apparent detergents. This determination depends on the formation of a blue color when methylene blue dye reacts with synthetic detergent compounds.

Micrograms per liter (ug/l, UG/L) is a unit expressing the concentration of chemical constituents in solution as weight (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (mg/l, MG/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the weight of solute per unit volume of water. Milligrams or micrograms per liter may be converted to milliequivalents (one thousandth of a gram-equivalent weight of a constituent) per liter by multiplying by the factors in table 1, page 5. Concentration of suspended sediment also is expressed in mg/l, and is based on the weight of sediment per liter of water-sediment mixture. Sediment concentrations may be converted to parts per million by using the factors in table 2, p. 5.

Partial-record station is a particular site where limited streamflow or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined either by sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling) (Guy, 1969).

Particle-size classification, used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation.
Silt.....	.004 - .062	Sedimentation.
Sand.....	.062 - 2.0	Sedimentation or sieve.
Gravel.....	2.0 - 64.0	Sieve.

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis (Guy, 1969).

Table 1.--Factors for conversion of chemical constituents in milligrams or micrograms per liter to milliequivalents per liter

<u>Ion</u>	<u>Multi- ply by</u>	<u>Ion</u>	<u>Multi- ply by</u>
Aluminum (Al ⁺³)*...	0.11119	Iodide (I ⁻¹).....	0.00788
Ammonia as NH ₄ ⁺¹05544	Iron (Fe ⁺³)*.....	.05372
Barium (Ba ⁺²).....	.01456	Lead (Pb ⁺²)*.....	.00965
Bicarbonate (HCO ₃ ⁻¹)	.01639	Lithium (Li ⁺¹)*...	.14411
Bromide (Br ⁻¹).....	.01251	Magnesium (Mg ⁺²)..	.08226
Calcium (Ca ⁺²).....	.04990	Manganese (Mn ⁺²)*.	.03640
Carbonate (CO ₃ ⁻²)..	.03333	Nickel (Ni ⁺²)*....	.03406
Chloride (Cl ⁻¹).....	.02821	Nitrate (NO ₃ ⁻¹)...	.01613
Chromium (Cr ⁺⁶)*...	.11539	Nitrite (NO ₂ ⁻¹)...	.02174
Cobalt (Co ⁺²)*.....	.03394	Phosphate (PO ₄ ⁻³)..	.03159
Copper (Cu ⁺²)*.....	.03148	Potassium (K ⁺¹)...	.02557
Cyanide (CN ⁻¹).....	.03844	Sodium (Na ⁺¹).....	.04350
Fluoride (F ⁻¹).....	.05264	Strontium (Sr ⁺²)*.	.02283
Hydrogren (H ⁺¹).....	.99209	Sulfate (SO ₄ ⁻²)...	.02082
Hydroxide (OH ⁻¹)...	.05880	Zinc (Zn ⁺²)*.....	.03060

*Constituent reported in micrograms per liter; multiply by factor and divide results by 1,000.

Table 2.--Factors for conversion of sediment concentration in milligrams per liter to parts per million*
(All values calculated to three significant figures)

Range of concentration in 1000 mg/l	Di- vide by	Range of concentration in 1000 mg/l	Di- vide by	Range of concentration in 1000 mg/l	Di- vide by	Range of concentration in 1000 mg/l	Di- vide by
0 - 8	1.00	201-217	1.13	411-424	1.26	619-634	1.39
8.05- 24	1.01	218-232	1.14	427-440	1.27	636-650	1.40
24.2 - 40	1.02	234-248	1.15	443-457	1.28	652-666	1.41
40.5 - 56	1.03	250-264	1.16	460-473	1.29	668-682	1.42
56.5 - 72	1.04	266-280	1.17	476-489	1.30	684-698	1.43
72.5 - 88	1.05	282-297	1.18	492-506	1.31	700-715	1.44
88.5 -104	1.06	299-313	1.19	508-522	1.32	717-730	1.45
105 -120	1.07	315-329	1.20	524-538	1.33	732-747	1.46
121 -136	1.08	331-345	1.21	540-554	1.34	749-762	1.47
137 -152	1.09	347-361	1.22	556-570	1.35	765-780	1.48
153 -169	1.10	363-378	1.23	572-585	1.36	782-796	1.49
170 -185	1.11	380-393	1.24	587-602	1.37	798-810	1.50
186 -200	1.12	395-409	1.25	604-617	1.38		

*Based on water density of 1.000 g/ml and a specific gravity of sediment of 2.65.

Plankton is the floating (or weakly swimming) animal or plant life in a body of water consisting chiefly of minute plants (as diatoms and blue-green algae) and of minute animals (as protozoan, entomostracans, and various larvae).

Sediment is solid material that originates mostly from disintegrated rocks and is transformed by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time. It is computed by multiplying discharge times mg/l times 0.0027.

Total sediment discharge or total sediment load is the sum of the suspended-sediment discharge and the bedload discharge. It is the total quantity of sediment, as measured by dry weight or volume, that is discharged during a given time (Colby and Hembree, 1955).

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/l).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Sodium adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions with soil and is an index of sodium or alkali hazard to the soil. This ratio should be known especially for water used for irrigating farmland.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the dissolved-solids content in the water. Commonly, the amount of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos). This relation is not constant from stream to stream or from well to well, and it may even vary in the same source with changes in the composition of the water.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff." Streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Thermograph is a thermometer that continuously and automatically records, on a chart, the water temperature of a stream. "Temperature recorder" is the term used to indicate the location of the thermograph or a digital mechanism that automatically records water temperature on paper tape.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the water year.

Tons per acre-foot indicates the dry weight of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

Tons per day is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour day.

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of

individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

SPECIAL NETWORKS AND PROGRAMS

Some of the stations for which data are published in this report are included in special networks and programs. These stations are identified by their title, set in parentheses, under the station name.

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely be governed solely by natural conditions. Data collected at a bench-mark station may be used to separate effects of natural from manmade changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

International Hydrological Decade (IHD) River Stations provide a general index of runoff and materials in the water balance (discharge of water, and dissolved and transported solids) of the world. In the United States, IHD Stations provide indices of runoff and the general distribution of water in the principal river basins of the conterminous United States and Alaska.

Irrigation network stations are water-quality stations located at or near certain streamflow gaging stations west of the main stem of the Mississippi River. Data collected at these stations are used to evaluate the chemical quality of surface waters used for irrigation and the changes resulting from the drainage of irrigated lands. Prior to water year 1966, the data for these stations were published in the annual water-supply paper series, "Quality of Surface Water for Irrigation, Western States."

Pesticide program is a network of regularly sampled water-quality stations where additional monthly samples are collected to determine the concentration and distribution of pesticides in streams whose waters are used for irrigation or in streams in areas where potential contamination could result from the application of the commonly used insecticides and herbicides.

Radiochemical program is a network of regularly sampled water-quality stations where additional samples are collected twice a year (at high and low flow) to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

DOWNSTREAM ORDER AND STATION NUMBER

Stations are listed in downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all mainstream stations are listed before the first mainstream station. Stations on tributaries to tributaries are listed in a similar manner. In the list of water-quality stations in the front of this report the rank of tributaries is indicated by indentation, each indentation representing one rank.

As an added means of identification, each water-quality station, gaging station, and partial-record station has been assigned a station number. These are in the same downstream order used in this report. In assigning station numbers, no distinction is made between partial-record and continuous-record stations; therefore, the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive. The complete 8-digit number for each station, such as 06476000 which appears just to left of the station name includes the 2-digit part number "06" plus the 6-digit downstream order number "476000." In this report, the records are listed in downstream order by parts. The part number refers to an area whose boundaries coincide with certain natural drainage lines. Records in this report are in Part 6 (Missouri River basin). All records for a drainage basin encompassing more than one State could be arranged in downstream order by assembling pages from the various State reports by station number to include all records in the basin.

COLLECTION AND EXAMINATION OF DATA

Water samples for analyses usually are collected at or near gaging stations. The discharge records at these stations are used in conjunction with the computations of the chemical constituents and sediment loads. Discharge records for streams in South Dakota have been released in the report, "Water Resources Data for South Dakota, 1971 Part 1. Surface Water Records."

The data in this report include a description of the sampling station and tabulations of the samples analyzed. The description of the sampling station gives the location, drainage area, periods of record for the various water-quality data, extremes of the pertinent data, and general remarks, in a format similar to that used for streamflow gaging stations.

Water-quality information is presented for chemical quality, biological, microbiological, water temperature, and fluvial sediment. Chemical quality includes concentrations of individual dissolved constituents and certain properties or characteristics such as hardness, sodium adsorption ratio, specific conductance, and pH. The biological information includes qualitative and quantitative analyses of plankton, bottom organisms, and particulate inorganic and amorphous matter present. Microbiological information includes quantitative identification of certain bacteriological indicator organisms. Water-temperature data represent once-daily observations except for stations where a continuous temperature recorder furnishes information from which daily minimums and maximums are obtained. Fluvial-sediment information is given for suspended-sediment discharges and concentrations and for particle-size distribution of suspended sediment and bed material.

Prior to the 1968 water year, data for chemical constituents and concentrations of suspended sediment were reported in parts per million (ppm) and water temperatures were reported in degrees Fahrenheit (°F). In October 1967, the U.S. Geological Survey began to use the metric system; data for chemical constituents and concentrations of suspended sediment are now reported in milligrams per liter (mg/l) and water temperatures are given in degrees Celsius (centigrade, °C). In waters with a density of 1.000 g/ml (grams per milliliter), parts per million and milligrams per liter can be considered equal. In waters with a density greater than 1.000 g/ml, values in parts per million should be multiplied by the density to convert to milligrams per liter. To convert temperature in degrees Celsius to degrees Fahrenheit, see table 3, page 11.

In October 1968, the Geological Survey began reporting many of the chemical constituents as well as the minor elements in micrograms per liter instead of milligrams per liter. (See "Definitions of Terms," p. 5.)

Table 3.--Degrees Celsius (°C) to degrees Fahrenheit (°F)*
(Temperature reported to nearest 0.5°C)

°C	°F	°C	°F	°C	°F	°C	°F	°C	°F
0.0	32	10.0	50	20.0	68	30.0	86	40.0	104
.5	33	10.5	51	20.5	69	30.5	87	40.5	105
1.0	34	11.0	52	21.0	70	31.0	88	41.0	106
1.5	35	11.5	53	21.5	71	31.5	89	41.5	107
2.0	36	12.0	54	22.0	72	32.0	90	42.0	108
2.5	36	12.5	54	22.5	72	32.5	90	42.5	108
3.0	37	13.0	55	23.0	73	33.0	91	43.0	109
3.5	38	13.5	56	23.5	74	33.5	92	43.5	110
4.0	39	14.0	57	24.0	75	34.0	93	44.0	111
4.5	40	14.5	58	24.5	76	34.5	94	44.5	112
5.0	41	15.0	59	25.0	77	35.0	95	45.0	113
5.5	42	15.5	60	25.5	78	35.5	96	45.5	114
6.0	43	16.0	61	26.0	79	36.0	97	46.0	115
6.5	44	16.5	62	26.5	80	36.5	98	46.5	116
7.0	45	17.0	63	27.0	81	37.0	99	47.0	117
7.5	45	17.5	63	27.5	81	37.5	99	47.5	117
8.0	46	18.0	64	28.0	82	38.0	100	48.0	118
8.5	47	18.5	65	28.5	83	38.5	101	48.5	119
9.0	48	19.0	66	29.0	84	39.0	102	49.0	120
9.5	49	19.5	67	29.5	85	39.5	103	49.5	121

$$^{\circ}\text{C} = 5/9 (^{\circ}\text{F} - 32) \text{ or } ^{\circ}\text{F} = 9/5 (^{\circ}\text{C}) + 32.$$

Solutes

The methods of collecting and analyzing water samples for determining the kinds and concentrations of solutes are described by Brown, Skougstad, and Fishman (1970). One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge depending on the source of material and the turbulence and the mixing of the stream. Some must be sampled at several verticals across the channel to determine accurately the solute load.

The daily chemical quality data in this report generally represent equal-volume composites for 2- to 30-day periods; the composite periods are selected on the basis of specific conductance of the daily samples and fluctuation of water discharge.

At chemical quality stations where monitors are installed, the records consist of daily maximum, minimum, and mean values for each constituent measured. More detailed records (hourly values) may be obtained from the district office of the U.S. Geological Survey at the address given on page II of this report.

Ground-water does not change significantly during short periods of time; infrequent sampling and analysis of ground water adequately defines ground-water quality at a given site. Water samples from wells are analyzed individually.

Temperature

Water temperatures are measured at most of the water-quality stations. For daily stations, the water temperatures are taken at about the same time each day when sample is collected. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where continuously recording thermographs are present, the records consist of maximum and minimum temperatures for each day and the monthly averages.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross-section, or a single sample may be obtained at a fixed concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the sub-divided day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume

that the sediment discharge for that day was computed by the sub-divided day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

WATER-SUPPLY PAPERS

The annual series of water-supply papers that give information on quality of surface waters in South Dakota are shown in the following table.

Table 4.--Water-Supply paper numbers and parts,
water years 1947-70

Year	Parts 5-6	Year	Parts 5-6	Year	Parts 5-6
1947	1102	1956	1451	1965	1963
1948	1132	1957	1521	1966	1993
1949	1162	1958	1572	1967	2013
1950	1187	1959	1643	1968	AB2094
1951	1198	1960	1743		AC2095
1952	1251	1961	1883	1969	AB2144
1953	1291	1962	1943		AC2145
1954	1351	1963	1949	1970	AB2154
1955	1401	1964	1956		AC2155

A In press.

B Part 5.

C Part 6.

SELECTED REFERENCES

- American Public Health Association, and others 1971, Standard methods for the examination of water and wastewater, 13th ed.: Am. Public Health Assoc., New York, 874 p.
- Brown, Eugene, Skougstad, M. W., and Fishman, M. J., 1970, Methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geol. Survey Techniques of Water-Resources Inv., book 5, chap. A1, 160 p.
- Colby, B. R., 1963, Fluvial sediments--a summary of source, transportation, deposition, and measurement of sediment discharge: U.S. Geol. Survey Bull. 1181-A, 47 p.
- Colby, B. R., and Hembree, C. H., 1955, Computations of total sediment discharge, Niobrara River near Cody, Nebraska: U.S. Geol. Survey Water-Supply Paper 1357, 187 p.
- Colby, B. R., and Hubbell, D. W., 1961, Simplified methods for computing total sediment discharge with the modified Einstein procedure: U.S. Geol. Survey Water-Supply Paper 1593, 17 p.
- Guy, H. P., 1970 Fluvial sediment concepts: U.S. Geol. Survey Techniques of Water-Resources Inv., book 3, chap. C1, 55 p.
- _____, 1969, Laboratory theory and methods for sediment analysis: U.S. Geol. Survey Techniques of Water-Resources Inv., book 5, chap. C1, 58 p.
- Guy, H. P., and Norman, V. W., 1970, Field methods for measurement of fluvial sediment: U.S. Geol. Survey Techniques of Water-Resources Inv., book 3, chap. C2, 59 p.
- Hem, J. D., 1970, Study and interpretation of the chemical characteristics of natural water - Revised edition: U.S. Geological Survey Water-Supply Paper 1473, 363 p.
- Langbein, W. B., and Iseri, K. T., 1960, General introduction and hydrologic definitions: U.S. Geol. Survey Water-Supply Paper 1541-A, 29 p.
- Porterfield, George, 1972, Computations of fluvial-sediment discharge: U.S. Geol. Survey Techniques of Water Resources Inv., book 3, chap. C3, 66 p.

Ritter, J. R., and Helley, E. J., 1969, Optical method for determining particle sizes of coarse sediment: U.S. Geol. Survey Techniques of Water-Resources Inv., book 5, chap. C3, 33 p.

U.S. Inter-Agency Committee on Water Resources, Subcommittee on Sedimentation, A study of methods used in measurement and analysis of sediment loads in streams. Published by the St. Anthony Falls Hydraulic Laboratory, Minneapolis, Minn.

_____ 1941, Methods of analyzing sediment samples: Rept. 4.

_____ 1953, Accuracy of sediment size analyses made by the bottom-withdrawal-tube method: Rept. 10.

_____ 1957, The development and calibration of visual accumulation tube: Rept. 11.

_____ 1957, Some fundamentals of particle size analysis: Rept. 12.

_____ 1959, Federal Inter-agency sedimentation instruments and reports: Rept. AA.

_____ 1961, The single stage sampler for suspended sediment: Rept. 13.

_____ 1963, Determinations of fluvial sediment discharge: Rept. 14.

CHEYENNE RIVER BASIN

06394000 BEAVER CREEK NEAR NEWCASTLE, WYO.

LOCATION.--Lat 43°32'07", long 104°07'02", in NW¼ sec.18, T.41 N., R.60 W., Weston County, at gaging station at highway bridge, 2.2 miles downstream from Sheep Creek, and 23 miles south of Newcastle.

DRAINAGE AREA.--1,320 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: December 1949 to September 1952, December 1952 to August 1953, October 1967 to September 1971.

Sediment records: September 1949, March 1950 to September 1957.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS-CHARGE (CFS)	DIS-SOLVED SILICA (SiO ₂) (MG/L)	TOTAL IRON (FE) (UG/L)	DIS-SOLVED CALCIUM (CA) (MG/L)	DIS-SOLVED MAGNESIUM (MG)	DIS-SOLVED SODIUM (NA) (MG/L)	DIS-SOLVED POTASSIUM (K) (MG/L)	BICARBONATE (HCO ₃) (MG/L)	CARBONATE (CO ₃) (MG/L)	DIS-SOLVED SULFATE (SO ₄) (MG/L)	DIS-SOLVED CHLORIDE (CL) (MG/L)
OCT. 10...	1300	18	10	40	470	110	410	4.6	171	0	1500	590
NOV. 05...	1130	23	10	40	460	120	310	4.0	183	0	1600	460
DEC. 02...	0900	17	9.2	40	460	110	410	3.8	159	0	1500	570
JAN. 05...	1420	11	13	100	510	120	290	4.2	268	0	1500	430
FEB. 02...	1430	16	15	280	550	81	340	4.2	256	0	1500	500
APR. 07...	1350	88	6.9	20	200	59	200	4.7	137	0	760	200
30...	0845	164	7.0	260	140	76	200	5.6	140	0	720	170
MAY 12...	1440	25	5.3	50	340	180	740	8.3	238	0	1900	810
26...	0915	146	7.1	370	100	43	240	4.7	146	0	730	83
JUNE 09...	1415	69	7.6	40	150	73	290	7.2	137	0	1000	110
JULY 08...	0930	9.8	5.1	20	440	110	530	4.7	90	0	1600	690
AUG. 04...	1515	4.8	1.2	30	540	79	770	8.8	73	0	1800	1000
SEP. 01...	1525	1.4	2.6	100	510	160	720	7.4	82	0	2100	950

DATE	DIS-SOLVED FLUORIDE (F) (MG/L)	DIS-SOLVED NITRATE (NO ₃) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	SODIUM AD-SORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT. 10...	1.0	.2	170	3200	4.35	156	1600	1460	4.4	4160	8.0	6.0
NOV. 05...	.9	.2	180	3010	4.09	187	1600	1450	3.3	3730	7.7	.5
DEC. 02...	1.0	1.1	160	3190	4.34	146	1600	1470	4.5	4110	7.8	.0
JAN. 05...	.9	1.7	350	2960	4.03	87.9	1800	1580	3.0	3880	7.7	.5
FEB. 02...	.8	2.1	320	3140	4.27	136	1700	1490	3.6	3930	7.8	.0
APR. 07...	.8	.7	140	1490	2.03	354	750	638	3.2	1960	7.8	8.5
30...	.8	.7	210	1390	1.89	616	660	545	3.4	1870	7.9	9.0
MAY 12...	1.1	.1	430	4120	5.60	278	1600	1410	8.1	5070	8.0	18.0
26...	.8	1.5	250	1280	1.74	505	440	320	5.1	1720	7.6	12.5
JUNE 09...	.9	.8	300	1750	2.38	326	680	568	4.9	2220	7.8	20.5
JULY 08...	.9	.2	230	3450	4.69	91.3	1500	1430	5.9	4370	7.5	18.0
AUG. 04...	.9	.1	310	4290	5.83	55.6	1700	1640	8.2	5930	7.8	25.0
SEP. 01...	1.0	.2	650	4470	6.08	16.9	1900	1830	7.1	5970	7.9	26.5

CHEYENNE RIVER BASIN

17

06395000 CHEYENNE RIVER AT EDMONT, S. DAK.

LOCATION.--Lat 43°18'20", long 103°49'14", in SW¼SE¼ sec.36, T.8 S., R.2 E., Fall River County, at gaging station, at downstream side of bridge on U.S. Highway 18 at Edgemont, 300 ft downstream from Chicago, Burlington and Quincy Railroad bridge, and 600 ft upstream from Cottonwood Creek.

DRAINAGE AREA.--7,143 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1971.

REMARKS.--Miscellaneous samples for chemical data published for water year 1970.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED MAN- GANESE (MN) (MG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)
OCT. 13...	1140	18	140	440	140	730	--	--	1800
NOV. 17...	1100	10	--	450	120	--	--	--	1700
DEC. 16...	1130	7.8	--	560	160	--	--	--	2100
JAN. 12...	1130	.41	670	820	250	875	17	482	3100
FEB. 11...	1300	2.3	--	510	140	--	--	--	1900
MAR. 10...	1130	7.2	--	440	110	--	--	--	1400
APR. 13...	1330	57	52	210	56	294	7.0	155	920
MAY 12...	1100	231	--	130	50	--	--	--	590
JUNE 16...	1200	609	--	120	41	--	--	--	660
JULY 21...	1130	11	220	340	120	620	10	221	1900
AUG. 11...	1100	3.2	--	430	170	--	--	--	2400
SEP. 15...	1145	.60	--	440	200	--	--	--	2900

DATE	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L) (00608)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (MG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)
OCT. 13...	850	.6	.00	--	.01	.35	270	4340	5.90
NOV. 17...	750	--	.00	--	.05	.050	--	3970	5.40
DEC. 16...	710	--	.10	--	.04	.010	--	4690	6.38
JAN. 12...	890	.7	.90	--	.07	.10	440	6700	9.11
FEB. 11...	630	--	.80	--	.03	.050	10	4180	5.68
MAR. 10...	560	--	.60	--	.00	.010	--	3510	4.77
APR. 13...	240	.6	.20	--	.04	.66	210	1960	2.67
MAY 12...	160	--	2.0	2.0	.21	.70	--	1280	1.74
JUNE 16...	55	--	.25	.25	.28	.90	--	1160	1.58
JULY 21...	420	.5	--	.02	.19	.020	770	3140	4.27
AUG. 11...	650	--	.10	.12	1.1	.040	--	4920	6.69
SEP. 15...	740	--	.16	.16	2.4	.11	--	5880	8.00

CHEYENNE RIVER BASIN

06395000 CHEYENNE RIVER AT EDMONT, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	PERCENT SODIUM (00932)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L) (00310)	TEMPER- ATURE (DEG C) (00010)
OCT. 13...	211	1700	--	7.8	49	5310	8.0	1.3	11.0
NOV. 17...	107	1600	--	--	--	4840	8.0	.4	4.5
DEC. 16...	98.8	2000	--	--	--	--	--	.7	0.5
JAN. 12...	7.42	3100	2700	6.9	38	7130	7.8	--	0.0
FEB. 11...	26.0	1900	--	--	--	4820	--	.7	1.0
MAR. 10...	68.2	1500	--	--	--	4180	7.6	1.2	0.5
APR. 13...	302	750	620	4.7	46	2390	8.0	3.2	16.5
MAY 12...	798	--	--	--	--	1790	7.9	3.6	13.5
JUNE 16...	1910	--	--	--	--	1640	7.5	4.8	24.0
JULY 21...	93.3	1300	1200	7.4	50	4400	7.5	1.3	21.5
AUG. 11...	42.5	--	--	--	--	6010	8.0	1.3	25.0
SEP. 15...	9.53	--	--	--	--	6810	7.8	1.0	15.0

FIELD DETERMINATIONS

DATE	TIME	DIS- CHARGE (CFS) (00060)	TEMPER- ATURE (DEG C) (00010)	AIR TEMP- ERATURE (DEG C) (00020)	PH (UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	DIS- SOLVED OXYGEN (MG/L) (00300)	IMME- DIATE COLI- FORM (COL. PER 100 ML) (31501)	FECAL COLI- FORM (COL. PER 100 ML) (31616)
OCT. 13...	1140	18	11.0	12.0	7.6	--	8.8	--	29
NOV. 17...	1100	10	4.5	6.5	8.2	4720	11.5	--	1
DEC. 16...	1130	7.8	0.5	7.0	7.8	5070	9.6	--	0
JAN. 12...	1130	.41	0.0	-14.0	7.6	--	8.9	--	0
FEB. 11...	1300	2.3	1.0	3.0	7.2	--	9.0	--	16
MAR. 10...	1130	7.2	0.5	15.5	7.5	4000	8.6	--	0
APR. 13...	1330	57	16.5	17.0	7.6	--	8.7	--	0
MAY 12...	1100	231	13.5	19.0	8.3	1800	9.4	--	820
JUNE 16...	1200	609	24.0	25.5	7.8	1660	6.3	--	5100
AUG. 11...	1100	3.2	25.0	32.5	7.6	6000	8.8	--	85
SEP. 15...	1145	.60	15.0	16.0	8.0	--	9.3	--	77

CHEYENNE RIVER BASIN

19

06395000 CHEYENNE RIVER AT EDMONT, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED BERYL- LIUM (BE) (UG/L) (01010)	CYANIDE (CN) (MG/L) (00720)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COPPER (CU) (UG/L) (01040)
OCT.									
13...	1140	11.0	18	0	0	.00	0	0	30
JAN.									
12...	1130	0.0	.41	0	0	.00	9	0	29
APR.									
13...	1330	16.5	57	0	0	.00	0	0	75
MAY									
12...	1100	13.5	231	--	--	.00	--	--	--
JULY									
21...	1130	21.5	11	0	0	.05	1	--	15

DATE	TIME	DIS- SOLVED LEAD (PB) (UG/L) (01049)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L) (01060)	DIS- SOLVED NICKEL (NI) (UG/L) (01065)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS- SOLVED SILVER (AG) (UG/L) (01075)	DIS- SOLVED VANA- DIUM (V) (UG/L) (01085)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
OCT.									
13...		0	.0	4	8	0	0	3.4	20
JAN.									
12...		0	.0	3	7	20	2	5.3	30
APR.									
13...		0	.0	9	8	0	0	2.0	20
MAY									
12...		--	--	--	--	--	--	--	--
JULY									
21...		5	--	0	6	0	0	1.6	490

PESTICIDE ANALYSES

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR- DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI- ELDRIN (UG/L) (39380)
OCT.										
13...	1140	11.0	18	.00	.00	.0	.00	.00	.00	.00
JAN.										
12...	1130	0.0	.41	.00	.00	.0	.00	.00	.00	.00
APR.										
13...	1330	16.5	57	.00	.00	.0	.00	.00	.00	.00
JULY										
21...	1130	21.5	11	.00	.00	.0	.00	.00	.00	.00

DATE	ENDRIN (UG/L) (39390)	HEPTA- CHLOR (UG/L) (39410)	HEPTA- CHLOR EPOXIDE (UG/L) (39420)	MALA- THION (UG/L) (39530)	PARA- THION (UG/L) (39540)	METHYL PARA- THION (UG/L) (39600)	DI- AZINON (UG/L) (39570)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)
OCT.										
13...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
JAN.										
12...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
APR.										
13...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
JULY										
21...	.00	.00	.00	--	--	--	--	.00	.00	.00

CHEYENNE RIVER BASIN

06401500 CHEYENNE RIVER BELOW ANGOSTURA DAM, S. DAK.

LOCATION.--Lat 43°20'42", long 103°26'12", in NE¼NW¼NW¼ sec.20, T.8 S., R.6 E., Fall River County, at gaging station, on right bank 800 ft downstream from Angostura Dam, 4.8 miles upstream from Fall River, and 6.5 miles southeast of Hot Springs.

DRAINAGE AREA.--9,100 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: September 1968 (miscellaneous station), October 1968 to September 1971.
Water temperatures: October 1968 to September 1971.
Sediment records: Water years 1958, 1960-63 (partial-record station).

EXTREMES.--

Period of record:

Dissolved solids (1968-69): Maximum, 1,770 mg/l Mar. 1 to Apr. 30, 1969; minimum, 1,620 mg/l Aug. 1 to Sept. 30, 1969.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 01-31	1.3	--	--	--	210	73	200	13	136
NOV. 01-30	1.1	--	--	--	210	73	184	13	144
DEC. 01-31	1.2	--	--	--	210	80	190	14	115
JAN. 01-31	1.3	--	--	--	220	80	190	16	153
FEB. 01-28	1.0	--	--	--	230	82	190	10	159
MAR. 01-31	.94	--	--	--	250	81	190	15	179
APR. 01-30	3.6	--	--	--	240	71	190	10	172
AUG. 01-31	.72	22	--	--	220	68	180	15	174
SEP. 01-30	.83	20	--	--	240	70	180	16	170

ANALYSES OF ADDITIONAL SAMPLES

OCT. 05...	A _{1.6}	9.0	20	45	220	78	200	12	170
DEC. 21...	A _{1.1}	9.8	40	120	210	80	194	12	153
FEB. 17...	A _{1.0}	7.8	0	230	250	80	213	12	160
APR. 13...	A _{.99}	7.6	40	110	240	84	206	12	180
JUNE 10...	A ₁₀₀₀	7.4	--	--	130	36	120	6.8	125
JULY 16...	A _{2.2}	8.2	--	--	150	54	130	8.9	186
AUG. 24...	A _{.72}	22	--	--	220	68	180	15	174
SEP. 20...	A _{1.0}	11	--	--	180	63	140	8.7	188

A Discharge at time of sampling.

CHEYENNE RIVER BASIN

21

06401500 CHEYENNE RIVER BELOW ANGOSTURA DAM, S. DAK.--Continued

EXTREMES.--Continued

Period of record:--Continued

Hardness (1968-69): Maximum, 843 mg/l May 1 to July 31, 1969; minimum, 784 mg/l Aug. 1 to Sept. 30, 1969.

Specific conductance (1968-70): Maximum daily, 2,270 micromhos Oct. 4, 1968; minimum daily, 1,800 micromhos Jan. 5, 1969.

Water temperatures (1968-70): Maximum, 30.0°C on several days during June to July 1970; minimum, freezing point Dec. 28, 29, 1968, Mar. 8, 1969.

REMARKS.--Daily samples for chemical analysis composited by discharge. Daily samples not collected May to July. Maximum observed during water year: Dissolved solids, 1,880 mg/l Apr. 13; hardness, 960 mg/l Feb. 17, Mar. 1-31; specific conductance, daily, 2,380 micromhos Oct. 15; water temperature, 24.0°C Aug. 4, 6, 11, 12, 16, 17. Minimum observed during water year: Dissolved solids, 1,710 mg/l Nov. 1-30; hardness, 470 mg/l June 10; specific conductance, daily, 1,390 micromhos June 10; water temperature, 1.0°C Dec. 23-25, 27, 28, Jan. 1-7. Discharge during period for which daily samples were not obtained equals 99.5% of total runoff.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO ₄) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	940	110	.6	.50	--	--	--	150	1730
NOV.									
01-30	940	110	.6	.10	--	--	--	140	1710
DEC.									
01-31	940	110	--	--	.60	--	.040	130	1730
JAN.									
01-31	1000	130	--	--	1.9	--	.050	130	1770
FEB.									
01-28	940	120	--	--	.44	--	.020	210	1850
MAR.									
01-31	960	140	--	--	.30	--	.070	120	1800
APR.									
01-30	1000	120	--	--	.27	--	.050	130	1770
AUG.									
01-31	980	110	.6	--	.90	.040	.050	160	--
SEP.									
01-30	960	120	.4	--	.40	.000	.050	140	--

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
05...	960	110	.6	.50	--	--	--	860	1780
DEC.									
21...	960	110	.5	.30	--	--	.010	140	1800
FEB.									
17...	1000	120	.7	.30	--	--	.010	180	1860
APR.									
13...	1000	120	.7	.00	--	--	--	160	1880
JUNE									
10...	540	58	.6	--	.31	.002	.003	120	--
JULY									
16...	660	66	.6	--	.16	.020	.070	180	--
AUG.									
24...	670	71	1.4	--	.12	.010	.030	140	--
SEP.									
20...	780	75	.7	--	.17	.010	.13	150	--

CHEYENNE RIVER BASIN

06401500 CHEYENNE RIVER BELOW ANGOSTURA DAM, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT.									
01-31	--	2.35	6.07	820	700	3.0	2050	7.6	--
NOV.									
01-30	--	2.33	5.08	810	690	2.8	2060	7.6	--
DEC.									
01-31	--	2.35	5.61	850	760	2.8	2150	8.4	--
JAN.									
01-31	--	2.41	6.21	880	750	2.8	2240	8.1	--
FEB.									
01-28	--	2.52	5.00	910	780	2.7	2230	7.6	--
MAR.									
01-31	--	2.45	4.57	960	810	2.7	2280	8.3	--
APR.									
01-30	--	2.41	17.2	890	750	2.8	2280	7.7	--
AUG.									
01-31	1690	2.30	3.29	830	690	2.7	2190	8.0	--
SEP.									
01-30	1690	2.30	3.79	890	750	2.6	2200	7.9	--

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
05...	1670	2.42	7.88	860	720	3.0	2380	8.1	19.0
DEC.									
21...	1640	2.45	5.64	840	710	2.9	2090	8.0	1.5
FEB.									
17...	1820	2.53	5.27	960	830	3.0	2210	8.1	3.0
APR.									
13...	1770	2.56	5.03	940	790	2.9	2180	7.7	18.0
JUNE									
10...	962	1.31	2600	470	370	2.4	1390	7.5	17.0
JULY									
16...	1170	1.59	7.01	600	440	2.3	1630	7.8	22.5
AUG.									
24...	1210	1.65	1.63	640	500	2.6	1670	7.9	23.0
SEP.									
20...	1350	1.84	3.94	710	550	2.3	1840	7.4	16.0

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2130	2000	2250	2200	2250	2210	2150	---	---	---	2150	2120
2	2140	1840	2200	2220	2220	2190	2160	---	---	---	2140	2160
3	2180	1920	2160	2230	2230	2200	2150	---	---	---	2130	2080
4	2150	1940	2190	2230	2230	2200	2170	---	---	---	2140	2070
5	2170	1870	2230	2200	2260	2190	2160	---	---	---	2130	2080
6	2160	1900	2180	2200	2250	2190	2150	---	---	---	2120	2080
7	2150	1850	2520	2190	2230	2200	2160	---	---	---	2170	2080
8	2130	1980	2300	2180	2250	2190	2160	---	---	---	2170	2060
9	2180	2000	2400	2210	2230	2190	2160	---	---	---	2180	2000
10	2150	2000	2220	2200	2210	2180	2150	---	---	---	2140	2050
11	2150	1910	2200	2230	2200	2200	2150	---	---	---	2180	2000
12	2110	1910	2220	2150	2210	2190	2160	---	---	---	2170	1980
13	2110	2000	2200	2180	2200	2200	2150	---	---	---	2180	2030
14	2100	2000	2170	2270	2230	2180	2170	---	---	---	2150	2040
15	2120	1880	2200	2250	2250	2200	2160	---	---	---	2140	2030
16	2100	1880	2180	2260	2240	2200	2170	---	---	---	2180	2130
17	2160	1950	2180	2180	2230	2190	2160	---	---	---	2170	2130
18	2170	1870	2220	2180	2230	2200	2160	---	---	---	2140	2070
19	2100	1970	2190	2190	2250	2200	2180	---	---	---	2180	2060
20	2180	1940	2170	2180	2230	2200	2180	---	---	---	2190	2060
21	2160	1960	2160	2180	2230	2160	2190	---	---	---	2200	2070
22	2150	2070	2140	2180	2250	2170	2200	---	---	---	2180	2060
23	2120	2040	2160	2200	2200	2150	2200	---	---	---	2190	2080
24	2080	1760	2150	2170	2240	2160	2210	---	---	---	2160	1980
25	2100	1940	2150	2190	2220	2160	2200	---	---	---	2210	1960
26	2110	2020	2170	2180	2240	2240	2210	---	---	---	2180	1980
27	2100	2100	2170	2180	2220	2220	2200	---	---	---	2160	2080
28	2100	2040	2180	2190	2220	2230	2200	---	---	---	2220	2080
29	2140	2120	2200	2170	---	2220	2200	---	---	---	2230	2050
30	2160	2100	2180	2210	---	2230	2220	---	---	---	2180	2030
31	2160	---	2250	2230	---	2220	---	---	---	---	2160	---
AVG	2140	1960	2210	2200	2230	2200	2170	---	---	---	2170	2060

CHEYENNE RIVER BASIN

23

06401500 CHEYENNE RIVER BELOW ANGOSTURA DAM, S. DAK.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	10.0	9.0	1.0	3.0	5.0	12.0	---	---	---	22.0	22.0
2	19.0	9.0	10.0	1.0	3.0	5.0	12.0	---	---	---	21.0	21.0
3	20.0	10.0	10.0	1.0	3.0	5.0	12.0	---	---	---	23.0	19.0
4	20.0	10.0	9.0	1.0	3.0	7.0	12.0	---	---	---	24.0	21.0
5	19.0	10.0	9.0	1.0	3.0	7.0	14.0	---	---	---	22.0	21.0
6	24.0	10.0	9.0	1.0	3.0	8.0	14.0	---	---	---	24.0	21.0
7	10.0	10.0	11.0	1.0	3.0	8.0	15.0	---	---	---	21.0	20.0
8	14.0	9.0	10.0	2.0	4.0	10.0	15.0	---	---	---	21.0	20.0
9	14.0	11.0	10.0	2.0	4.0	10.0	15.0	---	---	---	22.0	20.0
10	14.0	10.0	10.0	2.0	4.0	10.0	15.0	---	---	---	23.0	19.0
11	15.0	12.0	10.0	3.0	4.0	10.0	15.0	---	---	---	24.0	21.0
12	17.0	10.0	10.0	3.0	4.0	10.0	15.0	---	---	---	24.0	20.0
13	15.0	9.0	10.0	3.0	4.0	10.0	15.0	---	---	---	22.0	20.0
14	12.0	9.0	7.0	3.0	5.0	8.0	15.0	---	---	---	22.0	21.0
15	14.0	10.0	7.0	4.0	5.0	8.0	15.0	---	---	---	23.0	19.0
16	15.0	10.0	6.0	4.0	5.0	8.0	15.0	---	---	---	24.0	18.0
17	15.0	10.0	4.0	4.0	5.0	7.0	15.0	---	---	---	24.0	16.0
18	14.0	10.0	3.0	4.0	5.0	6.0	14.0	---	---	---	22.0	8.0
19	12.0	10.0	3.0	4.0	5.0	6.0	14.0	---	---	---	23.0	13.0
20	14.0	8.0	4.0	4.0	5.0	7.0	14.0	---	---	---	22.0	14.0
21	15.0	7.0	4.0	4.0	4.0	6.0	15.0	---	---	---	22.0	12.0
22	15.0	4.0	2.0	3.0	4.0	6.0	14.0	---	---	---	22.0	12.0
23	15.0	1.0	1.0	3.0	4.0	6.0	15.0	---	---	---	21.0	11.0
24	12.0	4.0	1.0	3.0	4.0	6.0	14.0	---	---	---	22.0	16.0
25	18.0	8.0	1.0	3.0	4.0	7.0	12.0	---	---	---	23.0	17.0
26	12.0	7.0	2.0	3.0	4.0	7.0	12.0	---	---	---	23.0	16.0
27	8.0	7.0	1.0	3.0	4.0	8.0	12.0	---	---	---	23.0	15.0
28	7.0	7.0	1.0	3.0	4.0	8.0	14.0	---	---	---	22.0	15.0
29	7.0	9.0	2.0	3.0	---	10.0	15.0	---	---	---	23.0	16.0
30	7.0	9.0	2.0	3.0	---	11.0	16.0	---	---	---	23.0	15.0
31	11.0	---	2.0	3.0	---	12.0	---	---	---	---	22.0	---
AVG	14.5	8.5	6.0	2.5	4.0	8.0	14.0	---	---	---	22.5	17.5

CHEYENNE RIVER BASIN

06402600 CHEYENNE RIVER NEAR BUFFALO GAP, S. DAK.

LOCATION.--Lat 43°30'05", long 103°04'23", in SW¼ sec.29, T.6 S., R.9 E., Custer County, 6.0 miles downstream from gaging station, 5.8 miles upstream from Cottonwood Creek and 12 miles east of Buffalo Gap.

DRAINAGE AREA.--9,810 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.

Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 1,930 mg/l May 1-23; minimum, 1,120 mg/l June 1-8.

Hardness: Maximum, 1,000 mg/l Dec. 1-31; minimum, 550 mg/l June 1-8.

Specific conductance: Maximum daily, 3,140 micromhos Jan. 13; minimum daily, 1,530 micromhos June 1, 4, 6, 7.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED TAS- SIUM (K) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 01-31	70	--	--	--	230	71	218	17	136
NOV. 01-30	65	--	--	--	230	73	215	17	157
DEC. 01-31	54	--	--	--	270	81	200	18	153
JAN. 01-31	52	--	--	--	220	76	200	19	159
FEB. 01-28	82	--	--	--	220	73	180	13	148
MAR. 01-31	71	--	--	--	270	76	180	14	185
APR. 01-30	69	--	--	--	250	68	200	13	172
MAY 01-23	256	--	--	--	250	73	200	11	186
24-31	4680	--	--	--	170	49	150	8.3	144
JUNE 01-08	3040	--	--	--	150	42	130	9.1	155
09-30	342	--	--	--	180	56	160	11	167
JULY 01-31	59	--	--	--	220	68	200	13	185
AUG. 01-31	58	12	--	--	200	65	220	15	172
SEP. 01-30	85	12	--	--	220	72	190	15	194
WTD. AVG. TIME WTD.	--	--	--	--	184	54	159	10	156
AVG.	261	--	--	--	228	70	195	15	167
TOT. LOAD (TONS)	--	--	--	--	47300	13900	41000	2660	40200

ANALYSES OF ADDITIONAL SAMPLES

OCT. 25...	B77	13	50	13	250	78	204	19	162
DEC. 23...	B53	17	20	83	230	79	200	19	151
FEB. 17...	B117	13	20	240	230	70	172	14	166
APR. 14...	B52	8.0	30	150	250	75	206	15	194
JUNE 08...	B1730	7.7	--	--	160	43	140	7.3	138
JULY 28...	B66	10	--	--	220	64	160	10	196
AUG. 25...	B51	11	--	--	200	67	190	14	186
SEP. 20...	B102	13	--	--	240	73	170	14	245

B Discharge at time of sampling.

CHEYENNE RIVER BASIN

25

06402600 CHEYENNE RIVER NEAR BUFFALO GAP, S. DAK.--Continued

EXTREMES.--1970-71:--Continued

Water temperatures: Maximum, 26.0°C on several days during June to September; minimum, freezing point on many days during November to January.

Period of record:

Dissolved solids (1968-69, 1970-71): Maximum, 1,930 mg/l May 1-23, 1971; minimum, 1,120 mg/l June 1-8, 1971.

Hardness (1968-69, 1970-71): Maximum, 1,000 mg/l Dec. 1-31, 1970; minimum, 550 mg/l June 1-8, 1971.

Specific conductance: Maximum daily, 3,140 micromhos Jan. 13, 1971; minimum daily, 1,530 micromhos June 1, 4, 6, 7, 1971.

Water temperatures: Maximum, 32.0°C on several days during July to August 1969; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Additional samples collected for more comprehensive definition of water quality.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

	DIS- SOLVED SULFATE (SO4) (MG/L)	DIS- SOLVED CHLORIDE (CL) (MG/L)	DIS- SOLVED FLUORIDE (F) (MG/L)	DIS- SOLVED NITRATE (N) (MG/L)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L)	DIS- SOLVED ORTHOPHOSPHORUS (P) (MG/L)	TOTAL PHOSPHORUS (P) (MG/L)	DIS- SOLVED BORON (B) (UG/L)	DIS- SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L)
	(00945)	(00940)	(00950)	(00618)	(00631)	(00671)	(00665)	(01020)	(07300)
OCT.									
01-31	1100	110	--	1.4	--	--	--	330	1920
NOV.									
01-30	1000	110	--	1.1	--	--	--	330	1900
DEC.									
01-31	1000	160	--	--	1.6	--	.060	290	1890
JAN.									
01-31	1000	130	--	--	1.6	--	.050	270	1810
FEB.									
01-28	930	98	--	--	1.5	--	.030	300	1660
MAR.									
01-31	1000	130	--	--	.60	--	.15	220	1790
APR.									
01-30	930	120	--	--	.64	--	.10	230	1820
MAY									
01-23	1020	120	--	--	.65	--	.90	280	1930
24-31	720	83	--	--	.28	--	.75	170	1310
JUNE									
01-08	590	63	--	--	.52	--	.33	470	1120
09-30	800	78	--	--	.33	--	.19	250	1440
JULY									
01-31	930	100	--	--	.29	--	.10	330	1780
AUG.									
01-31	920	110	.5	--	.70	.010	.050	330	--
SEP.									
01-30	990	100	.6	--	.81	.010	.060	340	--
WTD. AVG.	767	87	--	--	A.49	--	A.48	287	A1400
TIME WTD.									
AVG.	958	113	--	--	A.86	--	A.17	294	A1770
TOT. LOAD (TONS)	197000	22300	--	--	A121	--	A119	74	A343000

A Based on 304 days of chemical analysis.

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
05...	1000	120	.5	.80	--	--	--	1700	1880
DEC.									
23...	1000	110	.5	1.6	--	--	.020	290	1860
FEB.									
17...	930	93	.6	1.2	--	--	.040	250	1710
APR.									
14...	1000	110	.5	.30	--	--	--	300	1860
JUNE									
08...	620	71	.6	--	.34	.020	.19	140	--
JULY									
28...	910	93	.6	--	.24	.040	.050	290	--
AUG.									
25...	850	94	.8	--	.63	.010	.050	300	--
SEP.									
20...	980	81	.6	--	.81	.010	.060	280	--

CHEYENNE RIVER BASIN

06402600 CHEYENNE RIVER NEAR BUFFALO GAP, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT.									
01-31	--	2.61	363	860	750	3.2	2260	7.5	--
NOV.									
01-30	--	2.58	333	870	740	3.2	2230	7.7	--
DEC.									
01-31	--	2.57	276	1000	880	2.7	2340	8.1	--
JAN.									
01-31	--	2.46	254	860	730	3.0	2280	8.1	--
FEB.									
01-28	--	2.26	368	850	730	2.7	2200	7.8	--
MAR.									
01-31	--	2.43	343	990	830	2.5	2230	8.0	--
APR.									
01-30	--	2.48	339	900	760	2.9	2350	7.7	--
MAY									
01-23	--	2.62	1330	920	770	2.9	2440	7.6	--
24-31	--	1.78	16630	630	510	2.6	1800	7.4	--
JUNE									
01-08	--	1.52	9190	550	420	2.4	1590	7.6	--
09-30	--	1.96	1330	680	540	2.7	1890	7.5	--
JULY									
01-31	--	2.42	284	830	680	3.0	2230	7.6	--
AUG.									
01-31	1630	2.22	255	770	630	3.5	2190	7.9	--
SEP.									
01-30	1700	2.31	390	850	690	2.8	2260	7.9	--
WTD. AVG.	--	--	--	684	554	2.6	1890	7.6	--
TIME WTD.									
AVG.	--	2.61	914	856	720	2.9	2220	7.8	--
TOT. LOAD (TONS)	--	--	--	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
05...	1780	2.56	395	940	810	2.9	2370	8.0	15.0
DEC.									
23...	1750	2.53	271	900	770	2.9	2170	8.0	0.0
FEB.									
17...	1600	2.33	540	850	710	2.6	1950	8.1	1.0
APR.									
14...	1760	2.53	264	920	760	3.0	2150	7.7	17.0
JUNE									
08...	1120	1.52	5230	580	460	2.5	1570	7.7	12.5
JULY									
28...	1570	2.14	281	810	650	2.4	2080	7.7	19.0
AUG.									
25...	1520	2.07	211	770	620	3.0	2060	7.9	21.5
SEP.									
20...	1700	2.31	468	900	700	2.5	2240	7.8	11.0

CHEYENNE RIVER BASIN

27

06402600 CHEYENNE RIVER NEAR BUFFALO GAP, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2430	2250	2280	2500	2160	2210	2240	2390	1530	2300	2270	2130
2	2400	2220	2350	2440	2200	2160	2230	2370	1550	2320	2290	2190
3	2380	2300	2270	2350	2160	2170	2230	2390	1540	2310	2280	2180
4	2380	2320	2330	2690	2240	2180	2200	2430	1530	2350	2290	2140
5	2360	2300	2270	2540	2220	2180	2230	2440	1550	2320	2290	2170
6	2370	2320	2350	2620	2250	2180	2230	2400	1530	2330	2280	2130
7	2420	2250	2330	2580	2250	2160	2220	2400	1530	2320	2270	2140
8	2360	2240	2350	2480	2230	2160	2220	2380	1540	2350	2280	2160
9	2440	2270	2350	2500	2260	2170	2200	2420	2070	2350	2270	2170
10	2400	2300	2590	2430	2230	2170	2230	2390	2080	2320	2280	2150
11	2450	2300	2600	2430	2080	2230	2220	2410	1750	2370	2120	2160
12	2400	2270	2510	2450	2070	2510	2220	2400	1750	2310	2090	2140
13	2400	2200	2600	3140	2150	2450	2200	2400	1730	2310	2030	2140
14	2400	2200	2500	3080	2130	2460	2200	2390	1760	2300	2080	2130
15	2350	2200	2460	3000	2090	2480	2210	2390	1800	2310	2090	2140
16	2360	2240	2500	3120	2050	2430	2250	2380	1770	2340	2040	2170
17	2340	2250	2500	3010	2060	2450	2230	2450	1740	2350	2060	2130
18	2340	2240	2490	2820	2050	2290	2250	2480	1770	2300	2070	2180
19	2420	2250	2500	2850	2050	2340	2240	2450	2040	2090	2120	2220
20	2360	2300	2400	2840	2070	2300	2240	2300	1750	2080	2120	2180
21	2360	2280	2560	2910	2050	2320	2250	2320	1750	2100	2090	2220
22	2350	2250	2490	2860	2050	2340	2310	2350	2050	2100	2070	2190
23	2380	2300	2230	2830	2080	2660	2250	2300	1730	2090	2060	2210
24	2360	2280	2230	2850	2070	2580	2320	1750	2060	2090	2070	2230
25	2430	2270	2200	2910	2160	2550	2260	1760	2030	2080	2070	2180
26	2360	2260	2230	2950	2130	2580	2270	1760	2050	2060	2070	2230
27	2360	2250	2260	2880	2160	2470	2260	1770	2040	2060	1990	2210
28	2360	2200	2230	2850	2060	2390	2210	1750	2060	2080	2130	2180
29	2390	2250	2250	2880	---	2300	2260	1750	2180	2070	2080	2210
30	2370	2250	2300	2860	---	2300	2240	1750	2250	2060	2070	2230
31	2360	---	2300	3050	---	2290	---	---	---	2040	2030	---
AVG	2380	2260	2380	2760	2130	2340	2240	C2240	1820	2220	2140	2170

C Based on 30 days of data.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.0	2.0	4.0	1.0	2.0	1.0	5.0	20.0	22.0	22.0	24.0	24.0
2	14.0	2.0	3.0	1.0	2.0	1.0	8.0	22.0	23.0	22.0	24.0	24.0
3	16.0	3.0	4.0	1.0	2.0	1.0	8.0	20.0	23.0	22.0	24.0	24.0
4	14.0	4.0	3.0	0.0	2.0	1.0	10.0	18.0	22.0	22.0	24.0	24.0
5	14.0	5.0	4.0	0.0	2.0	1.0	10.0	18.0	22.0	24.0	24.0	26.0
6	12.0	7.0	4.0	0.0	2.0	1.0	10.0	20.0	23.0	24.0	22.0	25.0
7	8.0	6.0	2.0	1.0	1.0	1.0	12.0	20.0	23.0	22.0	22.0	25.0
8	6.0	6.0	1.0	2.0	1.0	1.0	12.0	22.0	23.0	22.0	22.0	24.0
9	3.0	7.0	0.0	2.0	1.0	1.0	15.0	20.0	24.0	22.0	24.0	23.0
10	3.0	7.0	0.0	2.0	2.0	2.0	15.0	22.0	23.0	24.0	26.0	23.0
11	3.0	9.0	0.0	2.0	1.0	2.0	18.0	22.0	23.0	24.0	24.0	22.0
12	3.0	7.0	0.0	1.0	1.0	2.0	22.0	20.0	23.0	22.0	24.0	20.0
13	3.0	7.0	1.0	2.0	1.0	2.0	22.0	24.0	24.0	22.0	24.0	20.0
14	3.0	5.0	1.0	2.0	1.0	2.0	22.0	24.0	24.0	26.0	26.0	20.0
15	6.0	5.0	1.0	2.0	1.0	2.0	20.0	24.0	24.0	22.0	24.0	20.0
16	10.0	7.0	1.0	2.0	1.0	2.0	20.0	24.0	24.0	22.0	24.0	20.0
17	10.0	7.0	1.0	2.0	2.0	1.0	22.0	22.0	25.0	22.0	22.0	18.0
18	12.0	5.0	1.0	2.0	1.0	2.0	22.0	20.0	25.0	24.0	24.0	16.0
19	14.0	3.0	1.0	2.0	1.0	2.0	20.0	22.0	25.0	24.0	26.0	15.0
20	12.0	2.0	1.0	2.0	1.0	2.0	18.0	22.0	26.0	24.0	24.0	15.0
21	12.0	9.0	0.0	2.0	1.0	2.0	18.0	22.0	24.0	24.0	24.0	15.0
22	14.0	0.0	0.0	2.0	1.0	1.0	18.0	20.0	24.0	24.0	24.0	15.0
23	12.0	0.0	0.0	2.0	1.0	2.0	18.0	18.0	25.0	24.0	24.0	14.0
24	10.0	0.0	0.0	2.0	1.0	3.0	18.0	18.0	25.0	22.0	24.0	14.0
25	10.0	2.0	1.0	2.0	1.0	3.0	15.0	20.0	25.0	24.0	26.0	15.0
26	6.0	2.0	1.0	2.0	1.0	3.0	15.0	20.0	25.0	22.0	26.0	15.0
27	4.0	4.0	1.0	2.0	1.0	3.0	15.0	22.0	25.0	22.0	24.0	15.0
28	3.0	4.0	1.0	2.0	1.0	3.0	15.0	22.0	25.0	22.0	24.0	15.0
29	3.0	5.0	1.0	2.0	---	3.0	16.0	20.0	24.0	24.0	24.0	15.0
30	0.0	5.0	1.0	2.0	---	5.0	15.0	18.0	24.0	24.0	24.0	15.0
31	0.0	---	1.0	2.0	---	5.0	---	---	---	24.0	24.0	---
AVG	8.0	4.5	1.5	1.5	1.5	2.0	16.0	C21.0	24.0	23.0	24.0	19.0

C Based on 30 days of data.

CHEYENNE RIVER BASIN

06409000 CASTLE CREEK ABOVE DEERFIELD RESERVOIR, NEAR HILL CITY, S. DAK.
(Hydrologic benchmark and radiochemical station)

LOCATION.--Lat 44°00'49", long 103°49'48", in SW¼ sec.25, T.1 N., R.2 E., Pennington County, at gaging station, on right bank 50 ft downstream from highway bridge, 250 ft downstream from South Fork Castle Creek, 600 ft upstream from high-water line of Deerfield Reservoir, 2.5 miles southwest of Deerfield Dam, and 14 miles northwest of Hill City.

DRAINAGE AREA.--83 square miles, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1971.
Water temperatures: May 1964 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 12...	1240	11	0	--	57	29	1.5	1.4	282
NOV. 16...	1100	18	10	0	57	28	1.9	1.7	315
DEC. 17...	1300	12	10	27	57	29	2.5	3.0	316
JAN. 11...	1100	8.5	10	22	58	28	2.0	2.6	310
FEB. 09...	1130	13	60	0	58	28	1.3	1.6	307
MAR. 09...	1200	11	0	8	57	27	1.6	1.2	309
APR. 12...	1130	17	50	23	39	23	1.6	2.5	232
MAY 11...	1030	21	540	60	52	29	1.6	1.3	294
JUNE 15...	1100	16	--	--	52	29	1.4	.7	245
JULY 20...	1000	12	--	--	44	29	1.1	1.2	299
AUG. 10...	1100	12	--	--	53	28	1.2	1.2	276
SEPT. 14...	1245	12	120	20	27	30	1.3	.9	244

DATE	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	PERCENT SODIUM (00932)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L) (00310)	TEMPER- ATURE (DEG C) (00010)
OCT. 12...	7.78	260	10	.0	1	507	8.4	.7	5.5
NOV. 16...	12.6	260	0	.1	2	503	8.3	.8	0.0
DEC. 17...	8.75	260	2	.1	2	477	8.1	.8	0.5
JAN. 11...	6.08	260	6	.1	2	533	8.3	.8	0.0
FEB. 09...	9.34	260	9	.0	1	451	8.0	.7	1.0
MAR. 09...	7.57	250	0	.0	1	448	8.0	.8	1.5
APR. 12...	10.7	190	2	.1	2	304	8.3	3.4	3.5
MAY 11...	--	250	8	.0	1	453	8.1	.7	5.5
JUNE 15...	--	250	48	.0	1	429	8.0	.8	12.0
JULY 20...	--	230	0	.0	1	428	7.8	.7	10.5
AUG. 10...	--	250	21	.0	1	398	7.9	1.0	12.0
SEPT. 14...	--	190	0	.0	1	364	8.0	.8	8.0

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	DIS- SOLVED ALUM- INUM (AL) (UG/L) (01106)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	HEXA- VALENT CHRO- MIUM (CR6) (UG/L) (01032)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED COPPER (CU) (UG/L) (01040)	DIS- SOLVED CHRO- MIUM (CR) (UG/L) (01030)
OCT. 12...	1240	5.5	11	--	0	0	0	0	0	--	--
MAY 11...	1030	5.5	21	200	0	2	--	--	0	5	--
SEPT. 14...	1245	8.0	12	200	0	0	--	--	2	5	0

06409000 CASTLE CREEK ABOVE DEERFIELD RESERVOIR, NEAR HILL CITY, S. DAK.--Continued

EXTREMES.--1970-71:

Water temperatures: Maximum, 20.0°C June 25; minimum, freezing point on many days during October to March.

Period of record:

Water temperatures: Maximum, 22.0°C July 17, 1969, June 25, 1971; minimum, freezing point on many days during winter periods.

REMARKS.--Periodic samples obtained for analysis of suspended-sediment concentration most years.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS-SOLVED SULFATE (SO ₄) (MG/L) (00945)	DIS-SOLVED CHLORIDE (CL) (MG/L) (00940)	DIS-SOLVED FLUORIDE (F) (MG/L) (00950)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	TOTAL PHOSPHORUS (P) (MG/L) (00665)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L) (70300)	DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303)
OCT. 12...	5.4	.7	.1	.10	--	--	--	262	.36
NOV. 16...	5.9	1.4	.2	.20	--	.040	0	259	.35
DEC. 17...	11	1.6	.2	.30	--	--	0	270	.37
JAN. 11...	6.1	1.9	2.9	.30	--	--	20	265	.36
FEB. 09...	6.3	10	.1	.30	--	--	0	266	.36
MAR. 09...	10	1.4	.1	.20	--	.050	20	255	.35
APR. 12...	9.1	.9	.2	.20	--	--	20	233	.32
MAY 11...	7.3	1.3	.0	--	.20	.050	20	--	--
JUNE 15...	6.5	--	.2	--	.08	.020	10	--	--
JULY 20...	3.8	.7	.2	--	.07	.020	40	--	--
AUG. 10...	5.5	1.9	.6	--	.03	.030	20	--	--
SEPT. 14...	9.0	1.5	.0	--	.05	.11	10	--	--

FIELD DETERMINATIONS

DATE	TIME	DIS-CHARGE (CFS) (00060)	TEMPERATURE (DEG C) (00010)	AIR TEMPERATURE (DEG C) (00020)	PH (UNITS) (00400)	SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095)	DIS-SOLVED OXYGEN (MG/L) (00300)	IMMEDIATE COLIFORM (COL. PER 100 ML) (31501)
OCT. 12...	1240	11	5.5	18.0	7.2	--	10.0	4
NOV. 16...	1100	18	.0	12.0	8.6	470	11.3	20
DEC. 17...	1300	12	.5	2.0	8.4	--	9.7	24
JAN. 11...	1100	8.5	.0	--	8.5	--	10.5	--
FEB. 09...	1130	13	1.0	3.0	8.4	--	9.8	50
MAR. 09...	1200	11	1.5	5.0	7.5	410	9.7	4
APR. 12...	1130	17	3.5	9.5	8.6	--	10.2	3
MAY 11...	1035	21	5.5	9.0	8.2	465	11.7	73
JUNE 15...	1100	16	12.0	24.0	9.0	460	10.2	230
AUG. 10...	1100	12	12.0	17.0	8.6	--	11.2	150
SEP. 14...	1245	12	8.0	12.5	9.2	--	10.9	67

DATE	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED LITHIUM (LI) (UG/L) (01130)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)	DIS-SOLVED MOLYBDENUM (MO) (UG/L) (01060)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SELENIUM (SE) (UG/L) (01145)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED STRONTIUM (SR) (UG/L) (01080)	DIS-SOLVED VANADIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZN) (UG/L) (01090)	TOTAL MERCURY (HG) (UG/L) (71900)
OCT. 12...	0	--	.1	--	--	--	--	--	--	15	--
MAY 11...	5	4	--	5	14	0	0	160	2.8	--	--
SEPT. 14...	0	70	--	3	0	4	0	90	2.3	--	.4

CHEYENNE RIVER BASIN

06409000 CASTLE CREEK ABOVE DEERFIELD RESERVOIR, NEAR HILL CITY, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	TOTAL FILT- RABLE RESIDUE (MG/L) (00515)	TOTAL NON- FILT- RABLE RESIDUE (MG/L) (00530)	DIS- SOLVED GROSS ALPHA AS U-NAT. (PC/L) (01515)	SUS- PENDE D GROSS ALPHA AS U-NAT. (PC/L) (01516)	DIS- SOLVED GROSS BETA AS CS-137 (PC/L) (03515)
OCT. 12...	1240	5.5	11	220	1	1.2	<.1	2.7
MAY 11...	1030	5.5	21	270	23	1.7	.2	12
SEP. 14...	1245	8.0	12	280	3	1.5	<.1	2.7

DATE	SUS- PENDE D GROSS BETA AS CS-137 (PC/L) (03516)	DIS- SOLVED RA-226 (RADON METHOD) (PC/L) (09511)	DIS- SOLVED NATURAL URANIUM (U) (UG/L) (22703)	DIS- SOLVED GROSS ALPHA AS U-NAT. (UG/L) (80030)	SUS- PENDE D GROSS ALPHA AS U-NAT. (UG/L) (80040)	DIS- SOLVED GROSS BETA AS SR90 /Y90 (PC/L) (80050)	SUS- PENDE D GROSS BETA AS SR90 /Y90 (PC/L) (80060)
OCT. 12...	<.4	.07	.9	3.5	<.4	2.1	<.4
MAY 11...	1.3	.05	1.0	5.0	.6	9.8	1.1
SEP. 14...	<.4	.08	<.4	4.5	<.4	2.2	<.4

PESTICIDE SAMPLES

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR- DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI- ELDRIN (UG/L) (39380)
OCT. 12...	1240	5.5	11	.00	.00	.0	.00	.00	.00	.00
SEP. 14...	1245	8.0	12	.00	.00	.0	.00	.00	.00	.00

DATE	ENDRIN (UG/L) (39390)	HEPTA- CHLOR (UG/L) (39410)	HEPTA- EPOXIDE (UG/L) (39420)	MALA- THION (UG/L) (39530)	PARA- THION (UG/L) (39540)	METHYL PARA- THION (UG/L) (39600)	DI- AZINON (UG/L) (39570)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)
OCT. 12...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
SEP. 14...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMP- ERATURE (DEG C) (00010)	INSTAN- TANEOUS DIS- CHARGE (CFS) (00060)	SUS- PENDE D SEDI- MENT (MG/L) (00530)	SUS- PENDE D SEDI- MENT DIS- CHARGE (T/DAY) (00060)
NOV. 16...	1100	0.0	18	71	3.4
DEC. 17...	1300	.5	12	74	2.4
JAN. 11...	1100	.0	8.5	72	1.7
FEB. 19...	1130	1.0	13	85	3.0
APR. 12...	1130	3.5	17	108	5.0
MAY 11...	1030	5.5	21	72	4.1
JUNE 15...	1100	12.0	16	49	2.1
JULY 25...	1030	15.5	12	30	.97
AUG. 11...	1100	12.0	12	10	.32
SEP. 14...	1245	8.0	12	6	.19

CHEYENNE RIVER BASIN

31

06409000 CASTLE CREEK ABOVE DEERFIELD RESERVOIR, NEAR HILL CITY, S. DAK.--Continued

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1970
(RECORDER WITH TEMPERATURE ATTACHMENT, CONTINUOUS ETHYL ALCOHOL-ACTUATED THERMOGRAPH)

DAY	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	7.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	7.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
3	6.5	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
4	8.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
5	7.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
6	7.0	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
7	4.0	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
8	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0
9	2.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
10	2.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
11*	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
12	4.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
13	4.5	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
14	4.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
15	4.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
16	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
17	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
18	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
19	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
20	3.5	2.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.5
21	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
22	4.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
23	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
24	4.0	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
25	3.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
26	1.5	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
27	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
28	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	1.0
29	1.5	1.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	1.5	1.0
30	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	---	---	1.5	1.0
31	0.0	0.0	---	---	0.0	0.0	3.0	0.0	---	---	1.0	1.0
AVG	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.5	0.0
DAY	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN
1	1.0	1.0	9.0	4.5	11.0	8.0	17.0	10.5	15.0	11.0	16.5	14.5
2	1.0	1.0	10.0	4.5	14.0	8.0	18.5	13.0	15.0	11.5	16.5	13.5
3	1.5	1.5	10.0	5.0	13.5	8.0	15.5	11.5	17.0	12.0	15.5	13.0
4	1.5	1.5	10.5	5.5	12.0	9.0	14.0	11.5	17.0	14.0	14.0	10.5
5	1.5	1.5	8.5	5.5	13.5	7.0	16.0	10.0	16.5	12.0	11.5	10.0
6	1.5	1.5	10.0	4.5	11.0	6.5	17.0	11.5	16.0	12.0	12.0	9.0
7	2.0	1.5	8.0	4.5	9.0	6.5	16.0	12.0	16.0	13.0	12.0	11.0
8	2.0	1.5	10.5	5.0	14.5	7.0	15.0	11.0	16.5	12.0	10.5	9.5
9	3.5	2.0	9.5	7.0	14.0	9.5	16.5	12.0	16.5	13.5	10.5	8.0
10	3.5	2.0	8.5	6.0	15.0	9.0	18.0	12.0	16.0	12.0	11.5	8.5
11	4.5	2.0	10.5	5.0	16.0	10.0	19.5	14.5	15.5	12.0	12.0	9.5
12	4.5	3.5	11.5	5.5	15.5	9.5	19.5	15.0	15.5	12.0	11.5	9.5
13	5.5	2.0	13.0	6.0	14.5	11.0	16.5	13.5	15.5	13.5	10.5	8.5
14	5.5	3.0	11.5	7.0	16.5	10.0	18.0	13.5	16.5	13.0	10.5	8.0
15	6.0	2.0	12.0	6.0	18.0	10.0	17.0	11.5	18.0	14.0	8.0	5.5
16	6.0	3.0	11.5	6.5	18.5	12.0	17.0	11.0	19.0	15.5	5.5	5.0
17	7.0	3.0	9.5	6.5	18.0	11.0	16.5	13.0	19.0	15.5	5.5	5.0
18	4.5	2.0	7.0	5.0	19.0	12.0	16.5	12.0	16.5	15.0	5.5	4.0
19	4.5	4.0	7.0	5.0	18.0	11.0	15.5	11.0	16.0	13.5	5.5	4.5
20	5.0	4.0	9.5	5.0	18.0	11.0	16.5	11.0	18.0	14.0	5.5	5.5
21	4.5	4.0	12.0	6.0	18.0	11.5	16.0	12.0	17.0	15.0	6.0	5.5
22	4.5	4.0	10.5	8.5	16.5	11.0	15.5	12.0	17.0	14.0	6.5	5.5
23	7.0	4.0	8.5	6.5	19.0	12.0	16.0	11.5	17.0	15.5	6.5	5.0
24	5.5	4.0	8.5	5.5	19.5	13.5	15.5	12.0	16.0	13.0	7.0	5.5
25	4.0	3.5	8.0	5.0	20.0	13.5	14.5	11.0	17.0	14.0	8.5	6.5
26	3.5	1.0	11.0	5.5	19.0	13.5	14.0	9.5	15.5	14.5	9.0	7.0
27	5.0	1.0	14.5	8.0	19.0	13.5	13.5	10.5	16.5	14.5	9.0	8.0
28	5.5	1.0	15.5	8.5	19.0	13.5	11.5	9.5	16.5	13.5	8.5	8.0
29	6.0	3.5	13.5	8.5	17.0	14.0	11.0	8.5	16.5	14.0	8.5	6.0
30	7.0	3.5	9.0	8.0	16.0	10.5	14.5	8.5	16.5	15.0	8.5	7.0
31	---	---	9.5	8.0	---	---	14.0	10.5	16.0	14.0	---	---
AVG	7.0	1.0	15.5	4.5	20.0	6.5	19.5	8.5	19.0	11.0	16.5	4.0

CHEYENNE RIVER BASIN

06411500 RAPID CREEK BELOW PACTOLA DAM, S. DAK.

LOCATION.--Lat 44°04'36", long 103°28'54", in SW¹/₄NE¹/₄ sec.2, T.1 N., R.5 E., Pennington County, at gaging station, on right bank 2,000 ft downstream from Pactola Dam, 3.9 miles upstream from Deer Creek, and 13 miles west of Rapid City.

DRAINAGE AREA.--320 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.

Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 248 mg/l Apr. 1-30; minimum, 208 mg/l July 1-31.

Hardness: Maximum, 200 mg/l Dec. 1-31, Feb. 1-28, Apr. 1-30; minimum, 170 mg/l June 1-30, Aug. 1 to Sept. 30.

Specific conductance: Maximum daily, 435 micromhos Feb. 8, 17, 22; minimum daily, 238 micromhos Mar. 28-30.

Water temperatures: Maximum, 8.0°C Sept. 19; minimum, 2.0°C on many days during January to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT.									
01-31	16	--	--	--	39	20	3.7	3.9	182
NOV.									
01-30	14	--	--	--	43	19	4.0	3.8	185
DEC.									
01-31	14	--	--	--	45	21	5.3	4.1	177
JAN.									
01-31	13	--	--	--	43	21	3.8	4.0	203
FEB.									
01-28	14	--	--	--	44	21	5.6	3.2	190
MAR.									
01-31	22	--	--	--	43	21	4.1	4.0	198
APR.									
01-30	141	--	--	--	43	23	7.6	3.4	190
MAY									
01-31	183	--	--	--	42	21	7.0	2.8	185
JUNE									
01-30	142	--	--	--	36	20	5.0	2.9	183
JULY									
01-31	73	--	--	--	41	20	4.5	2.8	187
AUG.									
01-31	74	8.9	--	--	38	18	3.6	2.7	169
SEP.									
01-30	46	8.5	--	--	36	19	3.2	2.8	165
WTD. AVG.	--	--	--	--	40	21	5.6	3.1	184
TIME WTD.									
AVG.	63	--	--	--	41	20	4.8	3.4	184
TOT. LOAD (TONS)	--	--	--	--	2490	1280	347	189	11400

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
12...	B15	7.6	0	30	41	21	3.8	3.2	183
DEC.									
14...	B14	7.9	0	32	40	21	3.7	3.5	178
FEB.									
23...	B14	9.3	50	420	44	22	3.6	3.5	198
APR.									
22...	B284	7.4	--	--	48	22	3.4	2.8	183
JUNE									
03...	B108	8.0	--	--	41	20	3.3	2.4	176
JULY									
12...	B54	8.3	--	--	40	19	3.1	2.8	179
AUG.									
03...	B62	8.9	--	--	38	18	3.3	2.4	180
SEP.									
14...	B46	9.2	--	--	36	19	7.8	2.8	169

B Discharge at time of sampling.

06411500 RAPID CREEK BELOW PACTOLA DAM, S. DAK.--Continued

EXTREMES.--Continued

Period of record:

Dissolved solids (1968-69, 1970-71): Maximum, 260 mg/l July 1 to Sept. 30, 1969; minimum, 208 mg/l

July 1-31, 1971.

Hardness (1968-69, 1970-71): Maximum, 206 mg/l Jan. 1 to Mar. 31, 1969; minimum, 170 mg/l June 1-30,

Aug. 1 to Sept. 30.

Specific conductance: Maximum daily, 435 micromhos Feb. 8, 17, 22, 1971; minimum daily, 238 micromhos

Mar. 28-30.

Water temperatures: Maximum, 8.0°C Aug. 29, 1969, Sept. 19, 1971; minimum, freezing point on several days

during December 1968.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year:

Hardness, 210 mg/l Apr. 22; water temperature, 9.0°C Aug. 3. Additional samples collected for more comprehensive definition of water quality.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (J0945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (J0940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (J0955)	DIS- SOLVED NITRATE (N) (MG/L) (J0618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (J0631)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L) (J0671)	TOTAL PHOS- PHORUS (P) (MG/L) (J0665)	DIS- SOLVED BORON (B) (UG/L) (J1020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (J0300)
OCT.									
01-31	47	1.0	--	.50	--	--	--	10	222
NOV.									
01-30	45	2.2	--	.00	--	--	--	10	216
DEC.									
01-31	46	2.7	--	--	.30	--	.030	0	210
JAN.									
01-31	44	1.8	--	--	.20	--	.030	0	220
FEB.									
01-28	49	2.1	--	--	.51	--	.050	0	240
MAR.									
01-31	44	11	--	--	1.0	--	.10	0	220
APR.									
01-30	44	3.4	--	--	.20	--	.020	40	248
MAY									
01-31	45	1.8	--	--	.07	--	.010	0	220
JUNE									
01-30	44	1.4	--	--	.09	--	.030	0	232
JULY									
01-31	40	1.7	--	--	.16	--	.040	10	208
AUG.									
01-31	40	2.3	.2	--	.20	.020	.050	10	--
SEP.									
01-30	49	1.8	.3	--	.20	.010	.030	20	--
WTD. AVG.	44	2.3	--	--	A.17	--	A.029	11	A228
TIME WTD.									
AVG.	45	2.8	--	--	A.29	--	A.040	8	A223
TOT. LOAD (TONS)	2720	145	--	--	A10	--	A1.7	1	A11800

A Based on 304 days of chemical analysis.

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
12...	50	2.2	.3	.00	--	--	--	180	235
DEC.									
14...	43	1.5	.0	.10	--	--	--	10	213
FEB.									
23...	47	1.4	.3	.30	--	--	.000	50	240
APR.									
22...	42	2.9	.2	--	.00	.020	.050	30	--
JUNE									
03...	41	1.3	.3	--	.08	.020	.030	30	--
JULY									
12...	42	1.0	.2	--	.06	.010	.050	40	--
AUG.									
03...	44	1.7	.3	--	.11	.010	.070	20	--
SEP.									
14...	48	1.2	.1	--	.27	.010	.080	10	--

CHEYENNE RIVER BASIN

06411500 RAPID CREEK BELOW PACTOLA DAM, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 01-31	--	.30	9.59	180	30	.1	377	7.8	--
NOV. 01-30	--	.29	8.16	180	33	.1	365	7.8	--
DEC. 01-31	--	.29	7.94	200	54	.2	365	8.3	--
JAN. 01-31	--	.30	7.72	190	27	.1	371	8.3	--
FEB. 01-28	--	.33	9.07	200	40	.2	385	7.9	--
MAR. 01-31	--	.30	13.1	190	31	.1	389	8.2	--
APR. 01-30	--	.34	94.4	200	46	.2	393	7.9	--
MAY 01-31	--	.30	109	190	40	.2	365	8.0	--
JUNE 01-30	--	.32	88.9	170	22	.2	334	7.7	--
JULY 01-31	--	.28	41.0	180	31	.1	353	7.8	--
AUG. 01-31	198	.27	39.6	170	30	.1	340	8.2	--
SEP. 01-30	203	.28	25.2	170	33	.1	339	8.0	--
WTD. AVG. TIME WTD. AVG.	--	--	--	184	35	.2	361	7.9	--
TOT. LOAD (TONS)	--	--	--	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

OCT. 12...	219	.32	4.63	190	38	.1	391	7.9	8.5
DEC. 14...	208	.29	8.05	180	38	.1	378	8.3	3.5
FEB. 23...	230	.33	9.40	200	39	.1	370	8.0	--
APR. 22...	219	.30	168	210	60	.1	370	7.9	5.0
JUNE 03...	204	.28	59.5	180	40	.1	361	8.0	6.0
JULY 12...	205	.28	30.4	180	31	.1	341	7.9	8.0
AUG. 03...	206	.28	34.8	170	21	.1	340	8.0	9.0
SEP. 14...	208	.28	25.8	170	29	.3	338	7.4	8.0

CHEYENNE RIVER BASIN

35

06411500 RAPID CREEK BELOW PACTOLA DAM, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355	375	370	360	425	248	360	335	360	355	344	343
2	343	375	366	358	430	248	355	335	360	350	344	336
3	345	375	380	360	430	250	355	330	370	345	341	336
4	352	372	365	360	430	248	360	335	360	345	343	335
5	355	368	362	360	420	248	355	330	370	350	341	336
6	350	373	370	360	430	248	360	330	370	345	342	336
7	340	367	370	360	430	248	360	330	360	340	343	337
8	343	372	370	362	435	250	355	325	365	340	346	335
9	352	370	365	355	425	245	350	330	360	340	343	337
10	345	375	362	358	425	245	355	325	360	350	341	336
11	350	375	368	358	430	248	355	330	355	350	342	336
12	343	370	362	360	420	248	350	325	355	345	339	336
13	345	367	370	360	430	245	350	325	360	345	338	336
14	343	366	368	360	425	242	350	320	360	340	339	337
15	343	365	370	358	430	242	350	325	360	350	339	335
16	353	363	353	360	430	242	345	320	360	340	338	337
17	347	360	368	362	435	245	345	335	360	355	338	337
18	360	360	370	365	425	245	350	---	360	355	337	337
19	350	365	368	368	440	246	345	---	360	350	341	336
20	353	368	365	368	430	246	350	---	360	345	338	336
21	353	365	370	368	430	242	340	---	360	345	338	336
22	348	370	368	368	435	240	345	---	355	345	341	336
23	348	363	372	370	430	245	340	---	355	345	338	336
24	315	360	370	370	430	240	345	---	355	350	339	335
25	335	360	370	372	420	245	345	---	355	350	332	338
26	318	360	370	372	425	240	340	---	355	350	332	337
27	318	362	360	370	430	242	340	---	350	345	331	343
28	300	360	367	372	430	238	340	---	355	340	328	343
29	300	360	368	375	---	238	340	---	355	345	327	344
30	350	365	370	372	---	238	335	---	355	345	324	344
31	355	---	368	372	---	240	---	355	---	345	328	---
AVG	342	367	368	364	429	244	349	---	359	346	338	337

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	6.0	5.0	3.0	2.0	3.0	4.0	5.0	5.0	6.0	6.0	6.0
2	7.0	6.0	5.0	3.0	2.0	3.0	4.0	5.0	5.0	6.0	6.0	7.0
3	7.0	6.0	5.0	3.0	2.0	3.0	4.0	5.0	5.0	6.0	6.0	7.0
4	7.0	6.0	5.0	2.0	2.0	3.0	4.0	5.0	5.0	6.0	6.0	7.0
5	7.0	6.0	4.0	2.0	2.0	3.0	4.0	5.0	5.0	6.0	6.0	6.0
6	7.0	6.0	4.0	2.0	2.0	3.0	4.0	5.0	5.0	6.0	6.0	6.0
7	7.0	6.0	5.0	2.0	2.0	2.0	4.0	5.0	5.0	6.0	6.0	6.0
8	6.0	6.0	5.0	2.0	3.0	3.0	4.0	5.0	5.0	6.0	6.0	6.0
9	6.0	6.0	5.0	3.0	3.0	3.0	4.0	5.0	5.0	6.0	6.0	6.0
10	6.0	6.0	4.0	3.0	3.0	3.0	4.0	5.0	5.0	6.0	6.0	6.0
11	6.0	6.0	4.0	2.0	3.0	3.0	4.0	5.0	5.0	6.5	6.0	7.0
12	6.0	6.0	4.0	2.0	3.0	3.0	4.0	5.0	5.0	6.5	6.0	7.0
13	6.0	6.0	4.0	2.0	3.0	3.0	4.0	5.0	5.0	6.5	6.0	7.0
14	6.0	6.0	4.0	2.0	3.0	3.0	4.0	5.0	5.0	6.5	6.0	7.0
15	6.0	6.0	4.0	2.0	3.0	3.0	4.0	5.0	5.0	6.5	6.0	7.0
16	6.0	6.0	4.0	3.0	3.0	3.0	4.0	5.0	5.0	6.5	6.0	7.0
17	6.0	6.0	4.0	3.0	3.0	3.0	4.0	5.0	5.0	6.0	6.0	7.0
18	6.0	6.0	4.0	3.0	3.0	3.0	4.0	---	6.0	6.0	6.0	7.0
19	6.0	6.0	4.0	3.0	3.0	3.0	4.0	---	6.0	6.0	6.0	8.0
20	6.0	6.0	3.0	3.0	3.0	3.0	4.0	---	6.0	6.0	6.0	7.0
21	6.0	6.0	3.0	3.0	3.0	3.0	4.0	---	6.0	6.0	6.0	7.0
22	6.0	5.0	3.0	2.0	2.0	3.0	4.0	---	6.0	6.0	6.0	7.0
23	6.0	4.0	3.0	2.0	2.0	3.0	4.0	---	6.0	6.0	6.0	6.5
24	6.0	5.0	3.0	3.0	2.0	3.0	5.0	---	6.0	6.0	6.0	6.5
25	6.0	5.0	3.0	3.0	3.0	3.0	5.0	---	6.0	6.0	6.0	6.5
26	6.0	5.0	3.0	3.0	3.0	3.0	5.0	---	6.0	6.0	6.0	7.0
27	6.0	5.0	3.0	3.0	3.0	3.0	5.0	---	6.0	6.0	6.0	7.0
28	6.0	5.0	3.0	3.0	3.0	3.0	5.0	---	6.0	6.0	6.0	7.0
29	6.0	5.0	4.0	3.0	---	3.0	5.0	---	6.0	6.0	6.0	7.0
30	6.0	5.0	3.0	3.0	---	4.0	5.0	---	6.0	6.0	6.0	7.0
31	6.0	---	3.0	2.0	---	4.0	---	5.0	---	6.0	6.0	---
AVG	6.0	5.5	4.0	2.5	2.5	3.0	4.0	---	5.5	6.0	6.0	7.0

CHEYENNE RIVER BASIN

06421500 RAPID CREEK NEAR FARMINGDALE, S. DAK.

LOCATION.--Lat 43°56'31", long 102°51'12", in SW¼SW¼ sec.19, T.1 S., R.11 E., Pennington County, at gaging station, on right bank at downstream side of bridge, 2.0 miles southeast of Farmingdale and 4.8 miles downstream from Antelope Creek.

DRAINAGE AREA.--602 sq mi.

PERIOD OF RECORD.--Chemical analyses: February to September 1953, October 1955 to September 1958, October 1968 to September 1971.

Water temperatures: October 1955 to September 1958, October 1968 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 710 mg/l Oct. 1-31; minimum, 372 mg/l May 1-31.

Hardness: Maximum, 490 mg/l Dec. 1-31; minimum, 250 mg/l May 1-31.

Specific conductance: Maximum daily, 1,500 micromhos Oct. 10; minimum daily, 440 micromhos Feb. 15.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 01-31	49	--	--	--	110	49	56	8.8	260
NOV. 01-30	46	--	--	--	100	43	51	6.8	254
DEC. 01-31	34	--	--	--	120	47	52	8.7	268
JAN. 01-31	34	--	--	--	110	43	38	9.1	251
FEB. 01-28	55	--	--	--	86	32	32	7.3	208
MAR. 01-31	73	--	--	--	94	35	43	6.2	211
APR. 01-30	230	--	--	--	72	28	29	5.4	197
MAY 01-31	284	--	--	--	57	27	17	3.8	194
JUNE 01-30	192	--	--	--	65	28	18	3.6	199
JULY 01-31	43	--	--	--	81	33	28	4.9	221
AUG. 01-31	22	8.6	--	--	98	42	47	6.1	254
SEP. 01-30	57	11	--	--	96	44	48	6.5	257
WTD. AVG. TIME WTD.	--	--	--	--	77	32	29	5.3	212
AVG. TOT. LOAD (TONS)	93	--	--	--	91	38	38	6.4	231
	--	--	--	--	7030	2960	2700	486	19500

ANALYSES OF ADDITIONAL SAMPLES

OCT. 13...	C61	3.0	40	110	110	47	58	7.3	274
DEC. 15...	C26	9.4	20	260	110	46	52	7.1	294
FEB. 17...	C127	8.3	70	170	57	19	26	12	134
APR. 23...	C385	8.6	--	--	62	28	16	4.2	199
JUNE 02...	C222	9.1	--	--	77	32	21	3.9	196
JULY 12...	C26	2.9	--	--	78	37	35	4.9	238
AUG. 04...	C20	1.4	--	--	110	48	49	6.0	272
SEP. 14...	C44	7.1	--	--	95	40	37	5.0	263

C Discharge at time of sampling.

CHEYENNE RIVER BASIN

37

06421500 RAPID CREEK NEAR FARMINGDALE, S. DAK.--Continued

EXTREMES.--Continued

Period of record:

Dissolved solids (1955-58, 1968-69, 1970-71): Maximum, 1,220 mg/l Sept. 12, 1969; minimum, 320 mg/l Nov. 5-7, 1956.

Hardness (1955-58, 1968-69, 1970-71): Maximum, 690 mg/l Oct. 1-7, 9-26, 1956; minimum, 250 mg/l May 1-31, 1971.

Specific conductance (1955-58, 1968-70, 1970-71): Maximum daily, 1,650 micromhos Oct. 16, 1956; minimum daily, 422 micromhos Jan. 8, 1958.

Water temperatures (1955-58, 1968-69): Maximum, 44.0°C June 12, 1956; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Dissolved solids, 756 mg/l Dec. 15. Minimum observed during water year: Dissolved solids, 352 mg/l Apr. 23; hardness, 220 mg/l Feb. 17. Additional samples collected for more comprehensive definition of water quality.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO ₄) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (MG/L) (01021)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	310	40	--	--	2.3	--	1.7	180	710
NOV.									
01-30	270	34	.5	3.9	--	--	--	180	674
DEC.									
01-31	280	42	--	--	4.7	--	2.2	140	700
JAN.									
01-31	240	46	--	--	4.7	--	1.7	120	660
FEB.									
01-28	190	31	--	--	4.1	--	1.0	150	564
MAR.									
01-31	270	27	--	--	2.9	--	1.5	130	592
APR.									
01-30	180	12	--	--	1.5	--	2.1	50	434
MAY									
01-31	130	7.2	--	--	.96	--	1.4	20	372
JUNE									
01-30	130	9.4	--	--	1.0	--	.63	60	406
JULY									
01-31	180	20	--	--	1.4	--	.64	170	498
AUG.									
01-31	280	29	.5	--	.87	.010	.49	200	--
SEP.									
01-30	290	34	.6	--	1.4	.78	.83	220	--
WTD. AVG.	187	18	--	--	A1.7	--	A1.4	86	B472
TIME WTD.									
AVG.	230	28	--	--	A2.3	--	A1.3	135	B562
TOT. LOAD (TONS)	17200	1660	--	--	A150	--	A121	8	B40300

A Based on 335 days of chemical analysis.

B Based on 304 days of chemical analysis.

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
13...	280	37	.5	1.9	--	--	--	1100	736
DEC.									
15...	260	34	.3	.90	--	--	--	150	756
FEB.									
17...	150	18	.3	2.1	--	--	.49	100	394
APR.									
23...	120	9.2	.2	--	1.2	.080	.20	70	--
JUNE									
02...	180	11	.4	--	.89	.25	.55	70	--
JULY									
12...	220	19	.4	--	.34	.20	.25	210	--
AUG.									
04...	300	38	.5	--	.17	.30	.46	210	--
SEP.									
14...	250	18	.5	--	.79	.74	.95	160	--

CHEYENNE RIVER BASIN

06421500 RAPID CREEK NEAR FARMINGDALE, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00210)
OCT.									
01-31	--	.97	93.9	480	250	1.1	1020	8.4	--
NOV.									
01-30	--	.92	83.7	430	220	1.1	958	7.5	--
DEC.									
01-31	--	.95	64.3	490	270	1.0	1020	8.4	--
JAN.									
01-31	--	.90	60.6	450	250	.8	978	8.5	--
FEB.									
01-28	--	.77	83.8	350	180	.7	824	7.9	--
MAR.									
01-31	--	.81	117	380	210	1.0	890	7.6	--
APR.									
01-30	--	.59	270	290	130	.7	678	7.5	--
MAY									
01-31	--	.51	285	250	94	.5	570	7.6	--
JUNE									
01-30	--	.55	210	280	110	.5	--	7.5	--
JULY									
01-31	--	.68	57.8	340	160	.7	769	7.7	--
AUG.									
01-31	640	.87	38.0	420	210	1.0	963	7.4	--
SEP.									
01-30	665	.90	102	420	210	1.0	987	8.0	--
WTD. AVG.	--	--	--	323	149	.7	1360	7.7	--
TIME WTD.									
AVG.	--	.79	122	382	192	.8	1160	7.8	--
TOT. LOAD (TONS)	--	--	--	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
13...	687	1.00	122	460	230	1.2	1060	8.0	10.0
DEC.									
15...	674	1.03	53.3	470	220	1.0	988	8.0	0.0
FEB.									
17...	364	.54	135	220	110	.8	630	7.7	0.0
APR.									
23...	352	.48	366	270	110	.4	580	7.6	12.5
JUNE									
02...	436	.59	261	320	160	.5	705	7.6	18.5
JULY									
12...	517	.70	36.4	350	150	.8	802	8.2	26.0
AUG.									
04...	689	.94	37.8	470	250	1.0	986	8.1	21.5
SEP.									
14...	588	.80	70.2	400	190	.8	878	7.9	16.0

CHEYENNE RIVER BASIN

39

06421500 RAPID CREEK NEAR FARMINGDALE, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	920	1000	970	920	1010	810	550	670	670	980	1180
2	960	970	1030	890	890	900	810	515	680	675	885	1120
3	1140	970	1030	1100	885	960	675	500	690	650	955	1180
4	1260	880	1060	910	965	880	650	505	660	630	1020	1100
5	1320	920	1110	985	930	900	650	510	635	660	1060	1040
6	1260	920	1000	995	910	870	640	505	550	615	1100	980
7	1240	940	970	990	955	930	650	490	520	650	1090	965
8	1360	1020	930	950	945	970	640	490	505	690	1160	885
9	1370	1070	930	965	945	990	715	490	520	750	1160	860
10	1500	1050	1020	955	910	900	800	520	630	755	1140	867
11	1440	920	1020	950	990	870	710	525	490	780	1130	898
12	1380	880	1080	990	865	690	625	510	490	785	1220	---
13	1400	920	1060	890	820	635	580	490	550	880	---	---
14	1250	910	1170	915	500	720	590	475	570	890	1310	---
15	1240	940	1080	980	440	825	620	485	550	935	1140	---
16	1360	940	1200	1040	450	930	630	490	610	980	690	---
17	1340	1060	1160	1060	550	960	675	520	600	1040	610	---
18	1350	910	1120	1140	645	1030	700	520	590	1080	675	---
19	1380	910	1090	930	770	1110	635	520	570	1090	740	---
20	1420	920	1080	960	840	995	965	535	590	1090	---	---
21	1370	960	1170	950	860	940	740	540	570	1030	1130	---
22	1350	920	1260	955	920	1000	660	545	590	1040	890	---
23	1400	1100	1270	895	1050	905	590	545	700	---	1080	---
24	1380	1040	1260	1050	970	970	600	620	670	995	1120	---
25	1460	940	1280	890	1000	---	610	660	620	1050	1120	---
26	1440	930	1280	920	870	1120	645	515	700	950	1180	---
27	1050	970	1240	885	810	820	640	550	710	975	1110	---
28	1000	950	1230	960	970	810	640	530	670	1020	1120	---
29	1120	910	1110	895	---	850	610	580	---	940	1160	---
30	1120	920	1090	960	---	810	570	580	---	905	1120	---
31	1210	---	1050	935	---	830	---	610	---	925	1150	---
AVG	1290	954	1110	963	842	904	669	530	604	C871	D1040	---

C Based on 30 days of data.

D Based on 29 days of data.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	1.0	0.0	0.0	0.0	0.0	5.0	10.0	---	---	---	21.5
2	---	1.0	1.0	0.0	0.0	0.0	4.0	9.0	---	---	---	21.5
3	---	1.0	1.0	0.0	0.0	0.0	5.0	12.0	---	---	---	20.5
4	---	1.0	1.0	0.0	0.0	1.0	4.0	8.0	---	---	---	16.0
5	---	1.0	0.0	0.0	0.0	0.0	4.0	12.0	---	---	22.0	14.0
6	---	2.0	0.0	0.0	0.0	0.0	5.0	10.0	---	---	22.0	20.5
7	---	3.0	0.0	0.0	0.0	0.0	8.0	11.0	---	---	23.0	23.0
8	---	4.0	0.0	0.0	0.0	0.0	13.0	11.0	---	---	23.0	16.0
9	---	3.0	0.0	0.0	0.0	1.0	8.0	14.0	---	---	26.0	14.0
10	---	4.0	0.0	0.0	0.0	0.0	14.0	12.0	---	---	21.0	16.0
11	---	4.0	0.0	0.0	0.0	1.0	8.0	9.0	---	---	19.0	16.0
12	---	4.0	0.0	0.0	1.0	0.0	9.0	11.0	---	---	21.0	---
13	---	5.0	0.0	0.0	1.0	1.0	14.0	13.0	---	---	---	---
14	---	4.0	0.0	0.0	1.0	4.0	13.0	14.0	---	---	22.5	---
15	---	4.0	1.0	0.0	1.0	0.0	10.0	16.0	---	---	20.5	---
16	---	2.0	0.0	0.0	0.0	0.0	10.0	15.0	---	---	20.0	---
17	---	3.0	0.0	0.0	0.0	0.0	11.0	13.0	---	---	23.0	---
18	---	4.0	0.0	0.0	0.0	1.0	14.0	12.0	---	---	22.0	---
19	6.0	4.0	0.0	0.0	0.0	0.0	11.0	10.0	---	---	19.5	---
20	6.0	2.0	0.0	0.0	0.0	0.0	12.0	11.0	---	---	---	---
21	8.0	1.0	0.0	0.0	0.0	0.0	10.0	20.0	---	---	20.5	---
22	8.0	0.0	0.0	0.0	0.0	0.0	11.0	11.0	---	---	22.0	---
23	9.0	0.0	0.0	0.0	0.0	1.0	8.0	10.0	---	---	23.0	---
24	7.0	1.0	0.0	0.0	0.0	1.0	11.0	---	---	---	18.0	---
25	8.0	0.0	0.0	0.0	1.0	1.0	9.0	---	---	---	18.5	---
26	5.0	0.0	0.0	0.0	1.0	1.0	5.0	---	---	---	20.5	---
27	5.0	0.0	0.0	1.0	0.0	5.0	4.0	---	---	---	20.0	---
28	4.0	0.0	0.0	0.0	0.0	5.0	6.0	---	---	---	20.5	---
29	4.0	0.0	0.0	0.0	---	5.0	8.0	---	---	---	23.0	---
30	3.0	0.0	0.0	0.0	---	9.0	9.0	---	---	---	24.0	---
31	4.0	---	0.0	0.0	---	8.0	---	---	---	---	---	---
AVG	---	2.0	0.0	0.0	0.0	1.5	9.0	---	---	---	---	---

CHEYENNE RIVER BASIN

06428500 BELLE FOURCHE RIVER AT WYOMING-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 44°44'59", long 104°02'49", in NE¼NW¼NW¼ sec.18, T.9 N., R.1 E., Butte County, South Dakota, at county bridge, 8 miles downstream from gaging station, and 4 miles northwest of Belle Fourche, S. Dak.

DRAINAGE AREA.--3,280 sq mi, approximately (at gaging station).

PERIOD OF RECORD.--Chemical analyses: October 1965 to September 1971.

Water temperatures: October 1965 to September 1971.

EXTREMES.--1970-71:

Specific conductance: Maximum daily, 2,650 micromhos Jan. 7, 12; minimum daily, 461 micromhos Apr. 12.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DAILY MEAN DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO ₂) (MG/L)	TOTAL IRON (FE) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO ₃) (MG/L)	CAR- BONATE (CO ₃) (MG/L)	DIS- SOLVED SULFATE (SO ₄) (MG/L)	DIS- SOLVED CHLO- RIDE (CL) (MG/L)
OCT. 13...	1515	25	4.0	50	260	75	110	7.6	171	0	1100	7.8
NOV. 04...	1420	27	7.6	50	290	82	95	7.3	183	0	1100	9.8
DEC. 01...	1125	40	9.2	130	300	70	91	7.4	177	0	1100	6.7
JAN. 06...	1445	7.0	11	60	410	100	140	8.5	348	0	1400	7.8
12...	1100	7.0	11	10	--	--	--	--	--	--	--	8.7
FEB. 03...	1200	22	7.9	110	190	55	52	7.4	159	0	650	5.4
APR. 14...	0730	814	6.6	0	88	19	17	6.0	109	0	230	3.8
MAY 11...	1225	270	11	580	180	47	50	6.3	201	0	590	6.7
JUNE 08...	1450	233	9.5	40	140	44	58	7.2	140	0	540	5.0
JULY 20...	1200	102	11	100	230	91	76	9.5	175	0	980	6.1
AUG. 03...	1440	102	7.4	90	130	34	88	9.0	181	0	500	5.9
31...	1510	70	4.6	50	130	42	91	7.9	159	0	550	7.1

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1930	1960	1980	2360	1710	1700	554	1070	1460	1200	1170	1240
2	1960	1920	1990	2400	1440	1720	515	1150	1440	---	1180	1270
3	---	1900	1850	2460	---	1720	546	1220	1380	1360	1180	1290
4	2030	1970	1880	---	1450	1720	714	1320	1390	---	1200	1250
5	2010	1940	1960	2290	1580	1720	737	1280	788	1450	1200	1170
6	2030	1960	1970	2570	1650	1750	799	1300	1180	1350	1180	975
7	2030	1880	1980	2650	1590	1760	863	1260	1010	1370	1180	1220
8	2050	1820	1890	2640	1750	1740	896	---	1220	1510	1170	1300
9	2040	1840	2000	2580	1870	1750	526	---	1430	1590	1200	1270
10	2020	1790	---	2620	1900	1700	521	1270	1290	1660	1210	1390
11	2010	1830	2040	2630	1120	1700	480	1300	944	1700	1220	1460
12	2010	1820	---	2650	---	1660	461	1300	1120	1770	---	1520
13	1990	1770	1940	2640	506	1510	519	1250	1120	1820	1210	1580
14	2000	1760	1810	2610	471	1300	677	1280	970	1850	1200	1620
15	2000	1780	2190	2610	469	1080	764	1310	1230	1870	---	1660
16	2000	1760	---	2630	466	920	877	1350	1360	1890	1180	1700
17	1990	1770	2200	2570	---	859	1010	1390	1380	1910	1170	1710
18	2010	---	2210	---	623	1040	1070	1430	---	1950	1150	1750
19	2020	1800	1960	---	512	1220	1140	1410	1400	1800	1120	1780
20	2020	1830	2300	2530	761	1320	1250	1450	1480	1820	1120	1790
21	2010	1800	2360	2140	874	1410	820	1480	1500	1560	1110	1800
22	2010	---	2380	1880	991	1420	628	1490	1540	1300	1120	1820
23	2020	2180	2400	2020	---	1470	746	1530	1670	1270	1140	1840
24	2040	2140	2420	2180	---	1510	888	1500	1730	1240	1190	1850
25	1980	2040	2420	2360	---	1600	768	1130	1560	1210	1210	1860
26	1980	2140	2430	2500	1450	1550	978	988	1620	1190	1220	1890
27	1970	2260	2440	---	---	1510	1030	910	1540	1180	1260	1940
28	1940	---	2470	2040	1600	1210	1090	1020	1400	1180	1300	1890
29	1960	2030	---	1510	---	718	1050	---	1590	1180	1290	1910
30	1940	2040	---	1630	---	695	1050	1260	1160	1160	1270	1970
31	1940	---	2370	1720	---	735	---	1130	---	1170	1250	---
AVG	2000	1920	2150	2350	---	1410	799	1280	1340	1500	1190	1590

CHEYENNE RIVER BASIN

41

06428500 BELLE FOURCHE RIVER AT WYOMING-SOUTH DAKOTA STATE LINE--Continued

EXTREMES.--1970-71:--Continued

Water temperatures: Maximum, 29.0°C June 24; minimum, freezing point on many days during January to March.

Period of record:

Specific conductance: Maximum daily, 2,840 micromhos Jan. 17, 1970; minimum daily, 461 micromhos Apr. 12, 1971.

Water temperatures: Maximum, 29.0°C July 20, 1966, July 7, Aug. 5, 6, 1968, July 25, 26, 29, Aug. 6, 1970, June 24, 1971; minimum, freezing point on many days during winter period.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS-SOLVED FLUORIDE (P) (MG/L)	DIS-SOLVED NITRATE (NO3) (MG/L)	DIS-SOLVED BORON (B) (UG/L)	DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L)	DIS-SOLVED SOLIDS (TONS PER AC-FT)	DIS-SOLVED SOLIDS (TONS PER DAY)	HARDNESS (CA, MG/L)	NON-CARBONATE HARDNESS (MG/L)	SODIUM AD-SORPTION RATIO	SPECIFIC CONDUCTANCE (MICROMHOS)	PH (UNITS)	TEMPERATURE (DEG C)
OCT. 13...	.8	.0	140	1630	2.22	115	970	830	1.5	2010	8.0	8.0
NOV. 04...	.8	.0	170	1650	2.24	120	1000	850	1.3	1930	8.0	3.5
DEC. 01...	.8	.2	310	1690	2.30	182	1000	855	1.1	2010	7.9	.5
JAN. 06...	.8	.0	200	2290	3.11	43.3	1400	1120	1.6	2560	7.6	.5
FEB. 12...	--	--	190	--	--	--	--	--	--	--	--	.0
MAR. 03...	.7	.1	130	1050	1.43	62.4	700	570	.9	1340	6.6	.0
APR. 14...	.4	1.5	60	428	.58	941	300	211	.4	585	7.6	8.0
MAY 11...	.6	.4	120	1000	1.36	729	660	495	.9	1230	7.9	12.0
JUNE 08...	.7	.7	140	877	1.19	552	540	425	1.1	1130	7.8	18.5
JULY 20...	.7	.2	290	1490	2.03	410	950	806	1.1	1730	8.1	22.5
AUG. 03...	.6	.1	130	863	1.17	237	460	312	1.8	1190	8.1	24.5
SEP. 31...	.6	.2	170	913	1.24	173	500	370	1.8	1260	8.2	23.0

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	1.5	0.5	0.5	0.0	0.0	3.5	14.0	16.5	24.5	23.0	25.0
2	17.0	0.5	0.5	0.5	0.0	0.0	3.5	15.0	18.0	---	23.0	24.0
3	15.0	1.0	0.5	0.5	---	0.0	3.0	17.5	17.5	24.5	24.0	20.0
4	16.5	3.0	0.5	---	0.0	0.0	3.0	18.5	17.5	---	24.0	15.0
5	17.0	7.0	0.5	0.5	0.0	0.0	7.0	17.0	19.0	24.5	26.5	14.0
6	11.0	7.0	0.5	0.5	0.0	0.0	9.0	17.0	15.0	26.0	27.5	18.0
7	6.0	3.0	1.0	0.5	0.0	0.0	12.0	14.0	18.5	25.0	26.0	18.5
8	7.0	4.0	0.5	0.5	0.0	0.0	11.0	---	21.0	25.0	25.0	18.0
9	9.5	4.0	0.5	0.5	0.5	0.0	9.0	---	19.0	27.0	24.0	19.0
10	8.0	1.0	---	0.5	0.5	0.0	9.0	14.0	20.5	26.0	24.0	21.0
11	11.0	4.5	0.5	0.5	0.0	0.0	8.5	14.5	24.0	26.5	24.5	22.5
12	10.0	5.0	---	0.0	---	0.5	7.0	17.0	24.0	28.0	---	22.0
13	8.0	4.0	0.5	0.0	0.0	3.0	7.0	19.5	24.5	26.0	25.0	20.5
14	8.0	4.0	0.5	0.0	0.0	2.0	---	19.0	26.0	26.0	26.0	17.0
15	9.0	4.0	0.5	0.0	0.0	2.0	13.0	19.0	25.5	27.0	---	13.5
16	10.0	4.5	---	0.0	0.0	2.5	13.5	17.0	25.5	28.5	27.0	13.5
17	10.5	4.0	0.5	0.0	---	1.0	14.0	18.0	26.0	26.0	25.5	12.0
18	10.0	---	0.5	---	0.0	2.0	12.0	13.0	---	24.5	24.0	12.5
19	9.0	4.0	0.5	---	0.0	2.5	9.5	13.5	26.0	23.5	24.0	13.0
20	10.0	3.0	0.5	0.0	0.0	6.0	12.0	14.0	26.0	24.5	24.0	11.0
21	10.0	1.0	0.5	0.0	0.0	4.0	10.5	18.0	25.5	22.0	25.5	14.0
22	9.5	---	0.5	0.0	0.0	3.0	9.0	15.0	25.5	25.0	25.0	15.5
23	10.5	1.0	0.5	0.0	---	2.5	12.0	15.0	26.0	26.5	23.0	15.5
24	9.0	1.0	0.5	0.5	---	3.5	12.5	15.0	29.0	26.0	25.0	17.0
25	7.0	1.0	0.5	0.5	---	6.5	10.5	16.0	28.5	21.0	24.5	18.5
26	7.0	1.0	0.5	0.5	0.0	6.0	9.0	15.0	27.5	22.0	24.0	18.0
27	2.0	1.0	0.5	---	---	6.5	8.0	20.5	24.0	18.0	26.5	15.0
28	2.0	---	0.5	0.5	0.0	5.5	10.0	22.0	22.0	16.0	25.0	16.0
29	3.0	1.0	---	0.5	---	6.5	10.0	---	24.0	18.0	24.5	17.0
30	4.0	1.0	---	0.0	---	8.0	10.0	16.0	23.0	20.0	21.0	16.0
31	3.5	---	0.5	0.0	---	4.5	---	14.5	---	20.5	23.5	---
AVG	9.5	3.0	0.5	0.5	---	2.5	9.0	16.5	23.0	24.0	24.5	17.0

CHEYENNE RIVER BASIN

06428500 BELLE FOURCHE RIVER AT WYOMING-SOUTH DAKOTA STATE LINE--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DAILY MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED ALUM- INUM (AL) (UG/L) (01106)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED BARIUM (BA) (UG/L) (01005)	DIS- SOLVED BERYL- LIUM (BE) (UG/L) (01010)	DIS- SOLVED BISMUTH (BI) (UG/L) (01015)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	DIS- SOLVED CHRO- MIUM (CR) (UG/L) (01030)	DIS- SOLVED COBALT (CO) (UG/L) (01035)
OCT. 13...	1515	25	57	10	57	3	30	1	30	17
JAN. 12...	1100	7.0	90	--	--	4	25	--	40	25
APR. 14...	0730	814	--	0	23	2	7	0	7	3
JULY 20...	1200	102	--	2	--	0	--	0	0	--

DATE	DIS- SOLVED COPPER (CU) (UG/L) (01040)	DIS- SOLVED GALLIUM (GA) (UG/L) (01120)	DIS- SOLVED GER- MANIUM (GE) (UG/L) (01125)	DIS- SOLVED LEAD (PB) (UG/L) (01049)	DIS- SOLVED LITHIUM (LI) (UG/L) (01130)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	TOTAL MERCURY (HG) (UG/L) (71900)	DIS- SOLVED MOLYB- DENIUM (MO) (UG/L) (01060)	DIS- SOLVED NICKEL (NI) (UG/L) (01065)
OCT. 13...	6	--	30	30	72	78	.5	6	30
JAN. 12...	4	--	40	40	110	380	--	8	25
APR. 14...	3	7	7	7	16	9	.2	3	14
JULY 20...	2	--	--	1	--	0	.2	4	5

DATE	DIS- SOLVED RUBI- DIUM (RB) (UG/L) (01135)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS- SOLVED SILVER (AG) (UG/L) (01075)	DIS- SOLVED STRON- TIUM (SR) (UG/L) (01080)	DIS- SOLVED TIN (SN) (UG/L) (01100)	DIS- SOLVED TI- TANIUM (TI) (UG/L) (01150)	DIS- SOLVED VANA- DIUM (V) (UG/L) (01085)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)	DIS- SOLVED ZIR- CONIUM (ZR) (UG/L) (01160)
OCT. 13...	10	7	3	3900	30	17	30	20	--
JAN. 12...	11	0	2	6700	25	25	40	--	--
APR. 14...	3	70	0	730	7	7	7.0	20	7
JULY 20...	--	0	0	--	--	--	--	140	--

CHEYENNE RIVER BASIN

43

06428500 BELLE FOURCHE RIVER AT WYOMING-SOUTH DAKOTA STATE LINE--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DAILY MEAN DIS- CHARGE (CFS) (00060)	ALDRIN (UG/L) (39330)	CHLOR- DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI- ELDRIN (UG/L) (39380)	ENDRIN (UG/L) (39390)	HEPTA- CHLOR (UG/L) (39410)
OCT. 13...	1515	25	.00	.0	.00	.00	.00	.00	.00	.00
JAN. 12...	1100	7.0	.00	.0	.00	.00	.00	.00	.00	.00
APR. 14...	0730	814	.00	.0	.00	.00	.00	.01	.00	.00
JULY 20...	1200	102	.00	.0	.00	.00	.00	.00	.00	.00

DATE	HEPTA- CHLOR EPOXIDE (UG/L) (39420)	LINDANE (UG/L) (39340)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)	PARA- THION (UG/L) (39540)	METHYL PARA- THION (UG/L) (39600)	MALA- THION (UG/L) (39530)	DI- AZINON (UG/L) (39570)
OCT. 13...	.00	.00	.00	.00	.00	.00	.00	.00	.00
JAN. 12...	.00	.00	.00	.00	.00	.00	.00	.00	.00
APR. 14...	.00	.00	.00	.00	.00	.00	.00	.00	.00
JULY 20...	.00	.00	.00	.00	.00	--	--	--	--

DATE	TIME	DAILY MEAN DIS- CHARGE (CFS) (00060)	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L) (00310)	CYANIDE (MG/L) (00720)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	TOTAL AMMONIA (N) (MG/L) (00610)
OCT. 13...	1515	25	.9	.01	.020	.01
JAN. 12...	1100	7.0	1.0	--	.020	.02
APR. 14...	0730	814	.9	.00	.70	.75
JULY 20...	1200	102	1.4	--	.32	.01

FIELD DETERMINATIONS

DATE	TIME	DAILY MEAN DIS- CHARGE (CFS) (00060)	SPECI- FIC COND- UCTANCE (MICRO- MHOS) (00095)	SOLVED OXYGEN (MG/L) (00300)	PH (UNITS) (00400)	FECAL COLI- FORM (COL. PER 100 ML) (31616)	TEMP- ERATURE (DEG C) (00010)
OCT. 13...	1515	25	2100	10.4	8.1	11	8.0
JAN. 12...	1100	7.0	2900	10.2	7.8	23	.0
APR. 14...	0730	814	580	9.6	7.8	76	8.0
JULY 20...	1200	102	1900	8.0	7.7	300	22.5

CHEYENNE RIVER BASIN

06434500 INLET CANAL NEAR BELLE FOURCHE, S. DAK.

LOCATION.--Lat 44°42'14", long 103°49'23", in NE&NW sec.36, T.9 N., R.2 E., Butte County, at gaging station, on right bank 0.5 mile downstream from Crow Creek, 0.9 mile downstream from diversion dam on Belle Fourche River, and 2.5 miles northeast of Belle Fourche.

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.

Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 1,060 mg/l July 1-31; minimum, 536 mg/l Feb. 1-28.

Hardness: Maximum, 660 mg/l July 1-31; minimum, 360 mg/l Feb. 1-28.

Specific conductance: Maximum daily, 1,840 micromhos July 19; minimum daily, 335 micromhos Feb. 12.

Water temperatures: Maximum, 29.0°C July 1; minimum, freezing point on many days during November to March.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS)	DIS- SOLVED SILICA (SiO ₂) (MG/L)	DIS- SOLVED IRON (FE) (UG/L)	DIS- SOLVED MAN- GANESE (MN) (UG/L)	DIS- SOLVED CAL- CIUM (CA) (MG/L)	DIS- SOLVED MAG- NE- SIUM (MG)	DIS- SOLVED SODIUM (NA) (MG/L)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L)	BICAR- BONATE (HCO ₃) (MG/L)
	(00260)	(00955)	(01046)	(01056)	(00915)	(00925)	(00933)	(00935)	(00440)
OCT.									
01-31	170	--	--	--	160	49	23	4.2	142
NOV.									
01-30	217	--	--	--	170	47	22	4.2	152
DEC.									
01-31	194	--	--	--	140	71	22	3.2	126
JAN.									
01-31	162	--	--	--	170	51	13	3.8	169
FEB.									
01-28	337	--	--	--	100	26	22	5.6	146
MAR.									
01-31	354	--	--	--	170	46	36	7.6	190
APR.									
01-09	452	--	--	--	110	25	28	6.0	148
JUNE									
03-30	129	--	--	--	170	35	54	5.2	206
JULY									
01-31	136	--	--	--	180	52	56	6.8	231
AUG.									
01-31	119	9.2	--	--	160	45	68	6.9	194
SEP.									
01-30	184	10	--	--	170	47	31	4.1	209
WTD. AVG.	--	--	--	--	152	45	32	5.3	171
TIME WTD.									
AVG.	A207	--	--	--	158	47	35	5.2	176
TOT. LOAD (TONS)	--	--	--	--	26500	7750	5480	929	29700

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
07...	B152	9.9	0	37	190	50	22	3.7	246
NOV.									
30...	B202	10	40	40	170	53	22	3.9	158
FEB.									
09...	B199	12	0	26	160	52	17	4.1	129
APR.									
02...	B905	5.6	70	33	93	21	22	5.6	150
JULY									
08...	B164	8.8	--	--	190	50	35	4.8	221
AUG.									
04...	B113	8.9	--	--	160	45	67	6.9	203
SEP.									
01...	B132	9.0	--	--	180	48	45	5.4	205

A Mean discharge based on 311 days of chemical analysis; mean discharge for 365 days, 177 cfs.
B Discharge at time of sampling.

CHEYENNE RIVER BASIN

45

06434500 INLET CANAL NEAR BELLE FOURCHE, S. DAK.--Continued

EXTREMES.--Continued

Period of record:

Dissolved solids (1968-69, 1970-71): Maximum, 1,100 mg/l Feb. 1 to Mar. 16, 1969; minimum, 556 mg/l Feb. 1-28, 1971.

Hardness (1968-69): Maximum, 780 mg/l Oct. 1-31, 1968; minimum, 360 mg/l Feb. 1-28, 1971.

Specific conductance: Maximum daily, 3,100 micromhos Feb. 13, 1969; minimum daily, 335 micromhos Feb. 12, 1971.

Water temperatures: Maximum, 29.0°C July 1, 1971; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Hardness, 680 mg/l July 8. Minimum observed during water year: Dissolved solids, 476 mg/l Apr. 2; hardness, 320 mg/l Apr. 2. Additional samples collected for more comprehensive definition of water quality. No flow Apr. 10 to May 25, May 28 to June 2.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO ₄) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (MG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (73300)
OCT.									
01-31	530	3.6	--	.60	--	--	--	90	908
NOV.									
01-30	530	4.2	--	.70	--	--	--	80	926
DEC.									
01-31	530	3.8	--	--	.57	--	.030	100	940
JAN.									
01-31	480	3.6	--	--	1.2	--	.15	100	940
FEB.									
01-28	280	3.3	--	--	.99	--	.60	40	536
MAR.									
01-31	510	7.6	--	--	.60	--	.80	70	950
APR.									
01-09	290	2.7	--	--	1.1	--	1.0	110	600
JUNE									
03-30	550	3.7	--	--	.35	--	.67	140	1000
JULY									
01-31	600	6.0	--	--	.41	--	.68	160	1060
AUG.									
01-31	570	6.5	.4	--	.39	.050	.080	150	--
SEP.									
01-30	520	4.8	.4	--	.56	.020	.060	120	--
WTD. AVG.	478	4.7	--	--	C.71	--	C.48	95	D836
TIME WTD.									
AVG.	506	4.7	--	--	C.65	--	C.40	166	D900
TOT. LOAD (TONS)	83000	815	--	--	C101	--	C68	16	D102000

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
07...	520	4.2	.3	.00	--	--	--	450	998
NOV.									
30...	540	4.0	.2	.60	--	--	--	60	983
FEB.									
09...	540	4.0	.2	1.0	--	--	.050	60	942
APR.									
02...	240	3.4	.3	1.2	--	--	--	90	476
JULY									
08...	540	3.1	.3	--	.02	.010	.30	170	--
AUG.									
04...	510	6.2	.5	--	.03	.020	.21	160	--
SEP.									
01...	570	4.5	.5	--	.18	.010	.13	150	--

C Based on 250 days of chemical analysis.
D Based on 311 days of chemical analysis.

CHEYENNE RIVER BASIN

06434500 INLET CANAL NEAR BELLE FOURCHE, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (60900)	NON- CAR- BONATE HARD- NESS (MG/L) (60902)	SODIUM AD- SORP- TION RATIO (60931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (60095)	PH (UNITS) (60400)	TEMPER- ATURE (DEG C) (60310)
OCT. 01-31	--	1.23	417	600	480	.4	1120	7.5	--
NOV. 01-30	--	1.26	543	600	480	.4	1130	7.4	--
DEC. 01-31	--	1.28	492	640	540	.4	1140	7.8	--
JAN. 01-31	--	1.28	411	630	500	.2	1160	7.9	--
FEB. 01-28	--	.73	488	360	240	.5	774	7.6	--
MAR. 01-31	--	1.29	908	610	460	.6	1190	8.1	--
APR. 01-09	--	.82	732	380	260	.6	771	7.4	--
JUNE 03-30	--	1.36	324	570	400	1.0	1400	7.4	--
JULY 01-31	--	1.44	389	660	470	.9	1380	7.7	--
AUG. 01-31	963	1.31	309	580	430	1.2	1290	8.0	--
SEP. 01-30	893	1.21	444	620	450	.5	1220	8.0	--
WTD. AVG. TIME WTD. AVG.	--	--	--	561	424	--	1120	7.7	--
TOT. LOAD (TONS)	--	--	--	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

OCT. 07...	921	1.36	410	670	470	.4	1270	7.8	7.0
NOV. 30...	883	1.34	536	640	510	.4	1200	7.9	3.3
FEB. 09...	864	1.28	516	620	510	.3	1140	8.0	.0
APR. 02...	465	.65	1160	320	200	.5	684	7.6	2.5
JULY 08...	941	1.28	417	680	500	.6	1140	7.8	21.0
AUG. 04...	905	1.23	276	580	420	1.2	1230	8.2	25.5
SEP. 01...	964	1.31	344	650	480	.8	1320	7.9	24.0

CHEYENNE RIVER BASIN

47

06434500 INLET CANAL NEAR BELLE FOURCHE, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1180	1140	1150	1060	---	1360	790	---	---	1240	1240	1300
2	1220	1080	1160	1180	---	1320	700	---	---	1150	1250	1310
3	1030	1100	1210	1210	---	1310	635	---	1220	1140	1270	1310
4	1100	1230	1090	1130	---	1270	735	---	1090	1270	1280	1320
5	1060	1210	1110	1160	---	1320	850	---	1190	1180	1290	1210
6	1120	1170	1130	1180	---	1390	865	---	605	1270	1290	1110
7	1060	1150	1290	1080	---	1290	920	---	970	1260	1290	1100
8	970	1100	1220	1120	---	1370	960	---	1000	1290	1280	1210
9	970	1260	1110	1120	---	1310	865	---	1060	1350	1270	1210
10	1040	1150	1100	1180	---	1390	---	---	1140	1390	1300	1160
11	1060	1150	1070	1130	---	1400	---	---	1010	1480	1310	1210
12	1040	1280	1180	1250	335	1340	---	---	1000	1480	1330	1190
13	1090	1300	1080	1170	470	1340	---	---	1060	1530	1320	1230
14	1090	1160	1130	1090	380	1280	---	---	1130	1640	1300	1230
15	1190	1170	1130	1160	405	1240	---	---	1080	1670	1320	1190
16	1090	1150	1130	1150	520	1150	---	---	1210	1710	1320	1160
17	1000	1270	1120	1010	550	1060	---	---	1270	1750	1290	1180
18	1200	1270	1140	1000	660	1070	---	---	1280	1780	1240	1230
19	1100	1120	1200	1020	810	1130	---	---	1230	1840	1270	1230
20	1220	1140	1100	1080	810	1250	---	---	1240	1750	1200	1220
21	1060	1170	1080	1120	950	1290	---	---	1290	1590	1220	1160
22	1100	1210	1060	1080	1010	1320	---	---	1340	1650	1230	1230
23	1070	1280	1060	1140	1090	1270	---	---	1370	1330	1220	1200
24	1090	1300	1220	1180	1140	1410	---	---	1400	1320	1270	1210
25	1120	1110	1210	1060	1120	1300	---	---	1350	1290	1290	1260
26	1090	1090	1220	1020	1110	1360	---	---	1380	1280	1330	1260
27	1080	1180	1120	1020	1230	1340	---	890	1340	1260	1350	1280
28	1070	1170	1140	1080	1210	1320	---	---	1330	1260	1370	1220
29	1160	1180	1130	1020	---	1140	---	---	1350	1260	1390	1270
30	1240	1150	1100	1090	---	840	---	---	1360	1260	1370	1230
31	1060	---	1130	---	---	930	---	---	---	1250	1350	---
AVG	1100	1180	1140	1110	---	1260	---	---	E1190	1420	1290	1220

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13.0	7.0	3.0	1.0	---	0.0	3.0	---	---	29.0	18.0	20.0
2	11.0	6.0	2.0	0.0	---	0.0	4.0	---	---	21.0	19.0	19.0
3	11.0	4.0	4.0	0.0	---	0.0	4.0	---	15.0	21.0	18.0	19.0
4	10.0	5.0	4.0	0.0	---	0.0	6.0	---	16.0	22.0	19.0	19.0
5	12.0	3.0	0.0	1.0	---	2.0	5.0	---	15.0	18.0	21.0	18.0
6	12.0	4.0	0.0	1.0	---	2.0	6.0	---	15.0	20.0	21.0	16.0
7	10.0	6.0	2.0	0.0	---	1.0	6.0	---	16.0	19.0	21.0	15.0
8	11.0	6.0	4.0	1.0	---	1.0	7.0	---	16.0	19.0	20.0	15.0
9	11.0	4.0	4.0	0.0	---	2.0	6.0	---	15.0	21.0	20.0	13.0
10	9.0	6.0	0.0	0.0	---	1.0	---	---	17.0	20.0	20.0	15.0
11	7.0	4.0	0.0	0.0	---	2.0	---	---	17.0	21.0	21.0	17.0
12	9.0	6.0	0.0	0.0	1.0	2.0	---	---	19.0	22.0	21.0	15.0
13	11.0	6.0	1.0	0.0	1.0	3.0	---	---	19.0	21.0	22.0	16.0
14	9.0	5.0	0.0	0.0	1.0	3.0	---	---	20.0	21.0	22.0	15.0
15	8.0	4.0	0.0	0.0	1.0	1.0	---	---	20.0	21.0	21.0	15.0
16	10.0	4.0	1.0	0.0	2.0	2.0	---	---	21.0	20.0	21.0	11.0
17	6.0	6.0	2.0	0.0	1.0	3.0	---	---	20.0	22.0	22.0	13.0
18	8.0	6.0	1.0	1.0	2.0	3.0	---	---	20.0	20.0	21.0	13.0
19	8.0	4.0	0.0	0.0	1.0	2.0	---	---	20.0	20.0	22.0	9.0
20	6.0	4.0	0.0	0.0	1.0	3.0	---	---	21.0	22.0	20.0	11.0
21	8.0	5.0	0.0	0.0	1.0	3.0	---	---	20.0	21.0	21.0	9.0
22	9.0	2.0	1.0	0.0	0.0	1.0	---	---	22.0	20.0	22.0	9.0
23	11.0	2.0	0.0	1.0	0.0	1.0	---	---	21.0	21.0	22.0	11.0
24	9.0	0.0	0.0	1.0	1.0	2.0	---	---	22.0	20.0	21.0	10.0
25	7.0	2.0	1.0	1.0	2.0	3.0	---	---	22.0	20.0	20.0	12.0
26	8.0	1.0	0.0	0.0	1.0	5.0	---	15.0	23.0	18.0	21.0	13.0
27	4.0	1.0	3.0	0.0	0.0	6.0	---	15.0	22.0	20.0	19.0	14.0
28	6.0	2.0	1.0	1.0	0.0	5.0	---	---	20.0	20.0	20.0	13.0
29	4.0	2.0	1.0	1.0	---	5.0	---	---	22.0	16.0	20.0	11.0
30	6.0	4.0	1.0	0.0	---	5.0	---	---	21.0	16.0	20.0	12.0
31	8.0	---	0.0	0.0	---	6.0	---	---	---	17.0	20.0	---
AVG	9.0	4.0	1.0	0.5	---	2.5	---	---	E19.1	20.5	20.5	14.0

E Based on 28 days of data.

CHEYENNE RIVER BASIN

06436800 HORSE CREEK NEAR VALE, S. DAK.

LOCATION.--Lat 44°39'30", long 103°20'17", in SE¼NW¼ sec.13, T.8 N., R.6 E., Butte County, at gaging station, on right bank 600 ft downstream from Dry Creek, 2.9 miles upstream from mouth, and 4 miles northeast of Vale.

DRAINAGE AREA.--530 sq mi, approximately.

PERIOD OF RECORD.--August 1964 to September 1968 (monthly), October 1968 to September 1971 (daily).
Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 6,310 mg/l Nov. 1-30; minimum, 290 mg/l Feb. 1-28.

Hardness: Maximum, 2,400 mg/l Jan. 1-31; minimum, 190 mg/l Feb. 1-28.

Period of record:

Dissolved solids (1968-69, 1970-71): Maximum, 8,350 mg/l Jan. 1 to Feb. 28, 1969; minimum, 290 mg/l Feb. 1-28, 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HC03) (MG/L) (00440)
OCT.									
01-31	9.7	--	--	--	260	160	358	9.4	228
NOV.									
01-30	5.7	--	--	--	330	310	860	14	279
JAN.									
01-31	3.5	--	--	--	360	370	770	11	--
FEB.									
01-28	37	--	--	--	42	21	44	6.6	101
MAR.									
01-31	215	--	--	--	61	27	54	9.1	132
MAY									
06-26	12	--	--	--	250	270	610	12	263
27-31	87	--	--	--	180	82	110	6.5	179
JUNE									
01-30	147	--	--	--	120	57	120	6.4	160
JULY									
01-31	105	--	--	--	200	80	110	9.6	214
AUG.									
01-31	149	7.6	--	--	200	81	110	8.9	202
SEP.									
01-30	176	6.6	--	--	130	56	100	7.6	153
WTD. AVG.	--	--	--	--	C134	C61	C108	C8.3	D166
TIME WTD.									
AVG.	A89	--	--	--	C195	C139	C303	C9.4	D191
TOT. LOAD (TONS)	--	--	--	--	C9600	C4400	C7750	C595	D11800

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
09...	B6.3	1.9	220	170	280	180	340	8.6	281
DEC.									
02...	B6.4	3.7	30	300	390	460	1120	19	276
FEB.									
01...	B3.1	7.9	140	460	280	300	670	20	360
APR.									
05...	B60	6.6	190	750	100	62	160	6.7	179
JUNE									
03...	B198	3.4	--	--	170	81	160	8.3	175
AUG.									
06...	B115	6.8	--	--	210	84	120	8.6	211
SEP.									
03...	B117	7.4	--	--	140	55	30	7.0	166

A Mean discharge based on 299 days of chemical analysis; mean discharge for 365 days, 78.6 cfs.

B Discharge at time of sampling.

C Based on 299 days of chemical analysis.

D Based on 268 days of chemical analysis.

CHEYENNE RIVER BASIN

49

06436800 HORSE CREEK NEAR VALE, S. DAK.--Continued

EXTREMES.--Continued

Period of record:--Continued

Hardness (1968-69, 1970-71): Maximum, 3,360 mg/l Jan. 1 to Feb. 28, 1969; minimum, 190 mg/l Feb. 1-28, 1971.

Specific conductance (1968-69): Maximum daily, 8,080 micromhos Feb. 1-3, 1969; minimum daily, 1,210 micromhos Sept. 8, 1971.

Water temperatures (1968-69): Maximum, 29.0°C Aug. 5, 1969; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during year: Dissolved solids, 7,470 mg/l Dec. 2; hardness, 2,800 mg/l Dec. 2; specific conductance, 6,860 micromhos Dec. 2; water temperatures, 29.0°C June 26, 27, July 2. Minimum observed during year: Specific conductance, 470 micromhos Feb. 17; water temperature, 0.0°C Jan. 18, 19, Feb. 19-21, Mar. 16, 17. Additional samples collected for more comprehensive definition of water quality. Miscellaneous samples for sediment data published for water year 1968.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO ₄) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	1800	54	--	5.4	--	--	--	580	3200
NOV.									
01-30	3300	150	--	22	--	--	--	1100	6310
JAN.									
01-31	3300	130	--	--	6.0	--	.030	190	3470
FEB.									
01-28	200	8.2	--	--	1.9	--	.90	80	290
MAR.									
01-31	260	11	--	--	.10	--	2.8	160	520
MAY									
06-26	2800	110	--	--	10	--	.080	660	4650
27-31	870	18	--	--	2.1	--	.75	160	1490
JUNE									
01-30	640	17	--	--	1.3	--	1.2	210	1140
JULY									
01-31	850	19	--	--	1.4	--	.78	260	1450
AUG.									
01-31	920	16	.6	--	.84	.010	.10	280	--
SEP.									
01-30	640	16	.5	--	1.3	.004	.006	240	--
WTD. AVG.	C ₆₆₇	C ₁₈	--	--	E _{1.1}	--	E _{1.1}	C ₂₃₀	E ₁₀₇₀
TIME WTD.									
AVG.	C ₁₄₃₀	C ₅₁	--	--	E _{2.6}	--	E _{7.6}	C ₃₆₄	E ₂₅₄₀
TOT. LOAD (TONS)	C ₄₇₈₀₀	C ₁₂₇₀	--	--	E ₇₅	--	E ₇₆	C ₁₆	E ₄₇₉₀₀

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
09...	1900	49	.5	3.6	--	--	--	600	3350
DEC.									
02...	4400	180	1.1	29	--	--	--	1300	7470
FEB.									
01...	2600	100	.5	15	--	--	.60	830	4620
APR.									
05...	670	26	.3	.20	--	--	--	220	1220
JUNE									
03...	870	26	.5	--	1.4	.020	.64	280	--
AUG.									
06...	850	18	.5	--	.92	.010	.23	280	--
SEP.									
03...	650	11	.5	--	.99	.010	.94	220	--

C Based on 299 days of chemical analysis.

E Based on 238 days of chemical analysis.

CHEYENNE RIVER BASIN

06436800 HORSE CREEK NEAR VALE, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 01-31	--	4.35	83.8	1300	1100	4.3	3350	8.0	080E
NOV. 01-30	--	8.58	97.1	2100	1800	8.2	6070	7.9	080E
JAN. 01-31	--	4.72	32.8	2400	2400	6.8	5910	8.0	080E
FEB. 01-28	--	.39	29.0	190	110	1.4	622	7.6	080E
MAR. 01-31	--	.71	302	260	160	1.4	786	8.1	080E
MAY 06-26	--	6.32	151	1700	1500	6.4	4900	7.7	080E
27-31	--	2.03	350	790	640	1.7	1800	7.6	080E
JUNE 01-30	--	1.55	452	530	400	2.3	1360	7.5	080E
JULY 01-31	--	1.97	411	830	650	1.7	1830	7.5	080E
AUG. 01-31	1450	1.97	583	830	670	1.7	1800	7.6	080E
SEP. 01-30	1040	1.41	494	560	430	1.8	1400	7.9	080E
WTD. AVG. TIME WTC. AVG.	--	C1.54	C411	C586	C452	C1.9	C1440	C7.8	--
TOT. LOAD (TONS)	--	C3.09	C270	C1050	C907	C3.5	C2740	C7.8	--

ANALYSES OF ADDITIONAL SAMPLES

OCT. 09...	2860	4.56	57.0	1400	1200	3.9	3360	7.5	9.0
DEC. 02...	6810	10.2	129	2800	2600	9.1	6860	8.2	1.0
FEB. 01...	4260	6.28	39.4	1900	1600	6.7	4910	8.4	.0
APR. 05...	1130	1.66	198	500	360	3.1	1510	7.6	5.5
JUNE 03...	1410	1.92	754	760	610	2.5	1880	8.0	19.0
AUG. 06...	1410	1.92	438	870	700	1.8	1760	7.9	22.5
SEP. 03...	1050	1.43	332	580	440	1.7	1430	7.5	18.5

C Based on 299 days of chemical analysis.

CHEYENNE RIVER BASIN

51

06436800 HORSE CREEK NEAR VALE, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2080	---	---	---	---	---	---	---	1910	1850	1670	1390
2	2100	---	---	---	---	---	---	---	1910	1860	1630	---
3	---	---	---	---	---	---	---	---	1950	1850	1700	1500
4	---	---	---	---	---	2050	---	---	1850	3200	1840	1680
5	---	3080	---	---	---	---	---	---	1630	3200	1830	1680
6	---	3080	---	---	---	---	---	3150	1590	2570	1830	958
7	3000	3080	---	---	---	---	---	3150	1080	2250	1860	945
8	3050	3080	---	580	---	2050	---	3150	1080	1980	1780	856
9	3080	3080	---	---	---	2100	---	3300	1300	2050	1790	1060
10	3080	---	---	---	---	2080	---	---	1080	1870	1780	1410
11	3080	3080	---	---	---	640	---	3750	1290	1880	1800	1590
12	3080	3080	---	---	---	890	---	3700	1090	1880	1800	1540
13	3080	3080	---	---	---	735	---	4050	1330	1770	1810	1620
14	3080	3080	---	---	---	755	---	4050	1490	1790	1880	1680
15	3080	---	---	---	540	735	---	4400	1560	1820	1860	1760
16	3080	---	---	---	620	760	---	4400	---	1770	1870	1690
17	3080	---	---	---	470	760	---	4350	---	1850	1820	1820
18	3080	---	---	---	535	---	---	4550	1640	1800	1780	1830
19	3080	---	---	600	600	---	---	4500	1820	1820	1780	1880
20	---	---	---	---	---	---	---	4600	1820	1840	1780	1980
21	3080	---	---	---	---	---	---	4600	1640	1800	1770	1930
22	3080	---	---	---	1060	---	---	5050	1630	1830	1790	1880
23	3080	---	---	---	1550	---	---	5050	1550	1830	1770	1900
24	---	---	---	---	1030	---	---	5700	2190	1740	1860	2000
25	---	---	---	---	---	---	---	5700	2200	1740	1870	2080
26	---	---	---	---	---	---	---	5100	1870	1730	1780	2460
27	---	---	---	---	---	---	---	1900	2020	1690	1780	2590
28	---	---	---	---	---	---	---	1500	2020	1670	1800	2660
29	---	---	---	---	---	---	---	1470	1880	1630	1770	2640
30	---	---	---	---	---	---	---	1510	2020	1620	1770	2460
31	---	---	---	---	---	---	---	1960	---	1260	1250	---
AVG	---	---	---	---	---	---	---	F 3920	H 1660	1920	1780	J 1770

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12.0	---	---	---	---	---	---	---	14.0	28.0	19.0	20.0
2	13.0	---	---	---	---	---	---	---	17.0	29.0	22.0	---
3	---	---	---	---	---	2.0	---	---	19.0	28.0	22.0	20.0
4	---	---	---	---	---	---	---	---	21.0	27.0	25.0	19.0
5	---	3.0	---	---	---	---	---	---	22.0	27.0	26.0	18.0
6	---	4.0	---	---	---	---	---	17.0	20.0	28.0	27.0	17.0
7	6.0	4.0	---	---	---	---	---	18.0	19.0	23.0	26.0	16.0
8	8.0	4.0	---	0.0	---	2.0	---	18.0	19.0	23.0	25.0	17.0
9	8.0	5.0	---	---	---	3.0	---	19.0	21.0	26.0	25.0	18.0
10	6.0	---	---	---	---	2.0	---	12.0	22.0	27.0	25.0	19.0
11	6.0	4.0	---	---	---	1.0	---	16.0	23.0	25.0	25.0	20.0
12	7.0	5.0	---	---	---	2.0	---	21.0	23.0	24.0	26.0	20.0
13	7.0	4.0	---	---	---	1.0	---	22.0	22.0	21.0	26.0	20.0
14	9.0	4.0	---	---	---	2.0	---	22.0	25.0	26.0	25.0	16.0
15	4.0	---	---	---	---	2.0	---	22.0	24.0	27.0	25.0	13.0
16	5.0	---	---	---	---	0.0	---	21.0	---	25.0	26.0	12.0
17	6.0	---	---	---	4.0	0.0	---	20.0	---	25.0	26.0	11.0
18	10.0	---	---	---	2.0	---	---	16.0	24.0	23.0	25.0	11.0
19	5.0	---	---	0.0	0.0	---	---	15.0	23.0	24.0	25.0	12.0
20	---	---	---	---	0.0	---	---	18.0	23.0	26.0	25.0	11.0
21	11.0	---	---	---	---	---	---	13.0	25.0	24.0	26.0	11.0
22	10.0	---	---	---	0.0	---	---	18.0	26.0	25.0	25.0	12.0
23	7.0	---	---	---	1.0	---	---	13.0	28.0	26.0	23.0	10.0
24	---	---	---	---	1.0	---	---	15.0	28.0	23.0	23.0	12.0
25	---	---	---	---	---	---	---	14.0	27.0	20.0	23.0	12.0
26	---	---	---	---	---	---	---	21.0	29.0	21.0	23.0	17.0
27	---	---	---	---	---	---	---	18.0	29.0	19.0	24.0	13.0
28	---	---	---	---	---	---	---	19.0	26.0	17.0	25.0	14.0
29	---	---	---	---	---	---	---	16.0	26.0	18.0	23.0	12.0
30	---	---	---	---	---	---	---	17.0	25.0	20.0	22.0	13.0
31	---	---	---	---	---	---	---	16.0	---	21.0	20.0	---
AVG	---	---	---	---	---	---	---	G 17.5	H 23.0	24.0	24.5	J 15.0

F Based on 25 days of data.

G Based on 26 days of data.

H Based on 28 days of data.

J Based on 29 days of data.

CHEYENNE RIVER BASIN

06437000 BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.

LOCATION.--Lat 44°30'47", long 103°08'11", in SE¼NW¼ sec.3, T.6 N., R.8 E., Meade County, at gaging station, near right bank on downstream side of bridge on State Highway 34, 0.5 mile upstream from Bear Creek, and 20 miles northeast of Sturgis.

DRAINAGE AREA.--5,870 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: August 1954 to September 1958, October 1968 to September 1971.

Water temperatures: August 1954 to September 1958, October 1968 to September 1971.

Sediment records: October 1955 to September 1958.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 2,580 mg/l Dec. 1-31; minimum, 798 mg/l Feb. 1-28.

Hardness: Maximum, 1,200 mg/l Dec. 1-31; minimum, 440 mg/l Feb. 1-28.

Specific conductance: Maximum daily, 3,740 micromhos Dec. 29; minimum daily, 650 micromhos Feb. 15.

Water temperatures: Maximum, 28.0°C June 23, July 16; minimum, freezing point on many days during December to February.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MANG- NESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT.									
01-31	73	--	--	--	200	120	165	22	124
NOV.									
01-30	59	--	--	--	220	150	253	25	180
DEC.									
01-31	30	--	--	--	210	160	260	31	122
JAN.									
01-31	23	--	--	--	230	130	190	30	183
FEB.									
01-28	511	--	--	--	100	46	67	7.8	148
MAR.									
01-31	446	--	--	--	110	56	110	14	169
APR.									
01-30	1130	--	--	--	130	38	56	13	168
MAY									
01-31	1110	--	--	--	140	43	45	12	169
JUNE									
01-30	911	--	--	--	140	53	51	10	164
JULY									
01-31	288	--	--	--	200	81	97	13	190
AUG.									
01-31	367	7.2	--	--	200	75	96	14	180
SEP.									
01-30	406	6.6	--	--	170	64	92	14	160
WTD. AVG.	--	--	--	--	144	54	72	12	166
TIME WTD. AVG.	444	--	--	--	171	85	124	17	163
TOT. LOAD (TONS)	--	--	--	--	63100	23800	31400	5330	72800

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
08...	B66	6.5	10	340	240	110	161	22	184
NOV.									
16...	B65	7.2	30	540	250	150	245	27	224
DEC.									
07...	B44	7.9	10	630	300	200	352	28	353
28...	B20	10	20	1300	320	220	340	24	236
FEB.									
09...	B45	9.9	30	710	230	120	200	23	294
MAR.									
01...	B147	7.6	80	830	170	100	204	14	220
APR.									
13...	B1620	6.7	70	160	78	25	26	9.0	148
MAY									
04...	B904	10	--	--	150	47	53	9.2	189
JUNE									
17...	B660	9.2	--	--	160	53	51	11	183
JULY									
14...	B235	6.0	--	--	210	80	88	13	195
AUG.									
17...	B285	7.9	--	--	220	83	110	15	216
SEP.									
07...	B1100	7.1	--	--	130	49	78	11	164

B Discharge at time of sampling.

06437000 BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

EXTREMES.--Continued

Period of record:

Dissolved solids (1954-58, 1968-69, 1970-71): Maximum, 5,230 mg/l May 25, 1958; minimum, 798 mg/l Feb. 1-28, 1971.

Hardness (1954-58, 1968-69, 1970-71): Maximum, 1,960 mg/l Nov. 16-17, 1955; minimum, 440 mg/l Feb. 1-28, 1971.

Specific conductance: Maximum daily, 5,770 micromhos May 25, 1958; minimum daily, 650 micromhos Feb. 15, 1971.

Water temperatures: Maximum, 30.0°C June 28, July 4, 7, 9, Aug. 7-8, 1970; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Dissolved solids, 3,650 mg/l Dec. 28; hardness, 1,700 mg/l Dec. 28. Minimum observed during water year: Dissolved solids, 475 mg/l Apr. 13; hardness, 300 mg/l Apr. 13. Additional samples were collected for more comprehensive definition of water quality. Miscellaneous samples for chemical data published for water years 1950, 1952, and for sediment data for water year 1960.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO ₄) (MG/L) (000945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (009940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (009950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	1200	21	.5	3.4	--	--	--	370	1950
NOV.									
01-30	1400	35	.5	7.4	--	--	--	430	2460
DEC.									
01-31	1600	42	--	--	.50	--	.40	350	2580
JAN.									
01-31	1300	32	--	--	4.5	--	.10	360	2190
FEB.									
01-28	450	11	--	--	2.2	--	8.0	110	798
MAR.									
01-31	600	15	--	--	3.0	--	1.2	190	1080
APR.									
01-30	470	7.4	--	--	.89	--	1.3	150	854
MAY									
01-31	470	5.8	--	--	.84	--	1.7	130	858
JUNE									
01-30	570	7.4	--	--	1.0	--	.60	150	1050
JULY									
01-31	820	14	--	--	1.5	--	.87	510	1410
AUG.									
01-31	860	12	.7	--	1.5	.020	.080	280	--
SEP.									
01-30	730	14	.5	--	1.4	.002	.006	230	--
WTD. AVG.	593	10	--	--	A1.3	--	A1.6	189	A1000
TIME WTD.									
AVG.	877	18	--	--	A1.7	--	A1.4	273	A1530
TOT. LOAD (TONS)	259000	4360	--	--	A569	--	A700	83	A375000

A Based on 304 days of chemical analysis.

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
08...	1200	20	.6	1.9	--	--	--	340	1950
NOV.									
16...	1400	42	.5	7.9	--	--	--	2000	2540
DEC.									
07...	1800	50	.6	15	--	--	--	460	3270
28...	2100	44	.4	7.9	--	--	.020	590	3650
FEB.									
09...	1100	28	.4	6.1	--	--	.090	320	2040
MAR.									
01...	1000	29	.5	7.2	--	--	--	270	1860
APR.									
13...	240	3.8	.3	.00	--	--	--	140	475
MAY									
04...	480	6.8	.3	--	.60	.090	1.2	150	--
JUNE									
17...	590	5.9	.5	--	.67	.060	.90	140	--
JULY									
14...	810	12	.5	--	.92	.050	.10	320	--
AUG.									
17...	890	14	.9	--	1.4	.020	.50	320	--
SEP.									
07...	580	7.6	.5	--	.85	.010	1.1	190	--

CHEYENNE RIVER BASIN

06437000 BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT.									
01-31	--	2.65	384	980	880	2.3	2190	7.9	--
NOV.									
01-30	--	3.35	392	1100	1000	3.3	2650	8.0	--
DEC.									
01-31	--	3.51	209	1200	1100	3.3	2950	8.1	--
JAN.									
01-31	--	2.98	136	1100	960	2.5	2500	8.1	--
FEB.									
01-28	--	1.09	1100	440	320	1.4	1120	7.3	--
MAR.									
01-31	--	1.47	1300	510	370	2.1	1410	7.2	--
APR.									
01-30	--	1.16	2600	480	340	1.1	1110	7.3	--
MAY									
01-31	--	1.17	2570	530	390	.9	1190	7.4	--
JUNE									
01-30	--	1.43	2580	570	430	.9	1340	7.5	--
JULY									
01-31	--	1.92	1100	830	680	1.5	1770	7.6	--
AUG.									
01-31	1360	1.85	1350	810	660	1.5	1760	7.9	--
SEP.									
01-30	1180	1.60	1290	690	560	1.5	1540	8.0	--
WTD. AVG.	--	1.42	2000	584	446	1.3	1350	7.5	--
TIME WTD.									
AVG.	--	2.0	1250	773	644	1.9	1800	7.7	--
TOT. LOAD (TONS)	--	620	--	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
08...	1860	2.65	347	1000	880	2.2	2170	8.0	5.5
NOV.									
16...	2250	3.45	448	1200	1000	3.1	3010	8.0	2.0
DEC.									
07...	2970	4.45	389	1600	1300	3.9	3350	8.0	0.0
28...	3240	4.96	198	1700	1500	3.6	3500	8.0	0.0
FEB.									
09...	1930	2.77	251	1100	840	2.6	2360	7.8	0.0
MAR.									
01...	1720	2.53	738	850	670	3.0	2100	8.1	1.0
APR.									
13...	466	.65	2080	300	180	.7	743	7.3	10.0
MAY									
04...	852	1.16	2080	570	410	1.0	1180	7.7	16.0
JUNE									
17...	974	1.32	1740	620	470	.9	1320	7.8	24.0
JULY									
14...	1320	1.80	838	850	690	1.3	1700	7.8	22.5
AUG.									
17...	1450	1.97	1120	890	710	1.6	1860	8.0	25.0
SEP.									
07...	948	1.29	2820	530	390	1.5	1310	7.2	18.0

DATE	DIS- SOLVED ALUM- INUM (AL) (UG/L) (01106)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED BARIUM (BA) (UG/L) (01005)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED COPPER (CU) (UG/L) (01040)	DIS- SOLVED LEAD (PB) (UG/L) (01049)
------	--	--	---	---	---	---	---	---

ANALYSIS OF ADDITIONAL SAMPLES

OCT.								
08...	200	40	0	0	0	0	17	0
	DIS- SOLVED LITHIUM (LI) (UG/L) (01130)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	DIS- SOLVED NICKEL (NI) (UG/L) (01065)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS- SOLVED SILVER (AG) (UG/L) (01075)	DIS- SOLVED STRON- TIUM (SR) (UG/L) (01080)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)	

ANALYSIS OF ADDITIONAL SAMPLES

OCT.							
08...	100	.0	3	2	0	3200	20

CHEYENNE RIVER BASIN

55

06437000 BELLE FOURCHE RIVER NEAR STURGIS, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1900	2480	2830	3050	---	2300	1120	1180	1230	1730	1680	1520
2	1980	2420	2470	2970	---	2050	1180	1180	1220	1800	1680	1560
3	2020	2370	2600	3220	---	2050	1160	1150	1350	1800	1620	1480
4	2070	2370	2910	---	---	2180	1220	1150	---	1670	1670	1500
5	2080	2370	3200	---	---	2150	1340	1130	1520	---	1780	1520
6	2120	---	3100	---	---	2100	1620	1100	1110	1680	1790	1630
7	2150	2500	3400	---	---	2300	1540	1060	1170	2000	1800	1250
8	---	---	3250	---	---	2370	1270	1110	1340	1740	1730	1110
9	2150	2530	2820	---	2200	2390	1240	---	1260	1770	1730	1180
10	2190	2750	2670	---	2320	2300	---	1130	1320	1920	1770	---
11	2170	2800	2660	---	2040	2240	820	1150	1350	---	1780	1500
12	2190	2550	3050	---	1830	1950	775	1160	1170	---	1780	1620
13	2190	2650	3490	---	1600	1900	720	1040	1290	---	1720	1630
14	2220	2600	3220	---	810	1580	735	950	1340	1740	1790	---
15	2300	2530	3220	---	650	---	745	1070	1320	1750	1860	1680
16	2300	2580	---	---	720	1160	885	1110	1330	1720	---	1770
17	2330	2650	3240	---	890	1120	950	1130	1360	1770	1890	1780
18	2330	2520	3190	3230	860	1140	---	1200	1380	1780	1770	1840
19	2400	2520	3080	2700	810	1240	1040	1240	1460	---	1740	1960
20	2400	2550	2990	2710	860	1330	1070	1250	1370	---	1760	1880
21	---	2600	---	2690	1000	1690	1470	1270	1420	1750	1740	1940
22	---	2900	---	3500	1280	1500	1260	1260	1460	1730	1760	1930
23	2440	---	---	3180	1370	1530	960	1120	1510	1730	---	1940
24	2450	---	---	2600	1610	1490	915	990	1500	1740	1760	---
25	2440	3080	---	2810	1650	1680	---	1080	---	1750	1760	---
26	2450	3080	---	2680	---	1800	960	1070	1550	1710	1830	---
27	2420	---	---	2800	1730	1720	1180	1120	1730	1700	1700	2010
28	2400	2750	---	3100	1840	1110	1250	---	1650	1680	1730	1930
29	2460	2820	3740	2230	---	1260	1190	1340	---	1650	1740	---
30	2550	---	---	2300	---	1250	1180	1090	1640	1650	---	---
31	2500	---	3300	---	---	1480	---	1120	---	1690	1640	---
AVG	F2270	C2620	---	---	---	H1750	E1100	G1140	E1380	C1750	F1750	---

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.0	1.0	1.0	0.0	0.0	1.0	3.0	15.0	19.0	22.0	22.0	---
2	12.0	1.0	1.0	0.0	0.0	1.0	3.0	14.0	16.0	20.0	23.0	25.0
3	17.0	2.0	1.0	0.0	0.0	2.0	7.0	12.0	18.0	21.0	23.0	19.0
4	18.0	1.0	1.0	0.0	0.0	1.0	5.0	14.0	---	26.0	23.0	15.0
5	12.0	1.0	1.0	0.0	0.0	1.0	4.0	14.0	21.0	---	25.0	14.0
6	12.0	---	1.0	0.0	0.0	1.0	---	13.0	19.0	26.0	25.0	14.0
7	7.0	3.0	0.0	0.0	0.0	1.0	8.0	13.0	18.0	22.0	25.0	17.0
8	---	---	1.0	0.0	0.0	1.0	8.0	17.0	18.0	22.0	26.0	17.0
9	6.0	2.0	1.0	0.0	0.0	4.0	8.0	---	20.0	21.0	25.0	15.0
10	6.0	4.0	1.0	0.0	0.0	6.0	---	14.0	22.0	21.0	25.0	---
11	12.0	5.0	1.0	0.0	0.0	2.0	11.0	14.0	23.0	---	26.0	27.0
12	7.0	3.0	0.0	0.0	0.0	2.0	9.0	17.0	21.0	---	26.0	23.0
13	8.0	3.0	0.0	0.0	0.0	3.0	7.0	19.0	22.0	---	26.0	17.0
14	6.0	2.0	0.0	0.0	1.0	3.0	8.0	15.0	22.0	22.0	23.0	---
15	3.0	1.0	0.0	0.0	2.0	---	9.0	18.0	24.0	21.0	25.0	12.0
16	6.0	8.0	---	0.0	1.0	2.0	10.0	17.0	25.0	28.0	---	12.0
17	6.0	7.0	1.0	0.0	1.0	2.0	10.0	14.0	25.0	25.0	27.0	12.0
18	12.0	2.0	0.0	0.0	1.0	2.0	---	12.0	23.0	23.0	25.0	13.0
19	5.0	2.0	0.0	0.0	2.0	1.0	10.0	10.0	22.0	---	25.0	12.0
20	6.0	5.0	0.0	0.0	1.0	2.0	10.0	11.0	24.0	---	25.0	12.0
21	---	2.0	---	0.0	1.0	2.0	11.0	20.0	25.0	22.0	20.0	9.0
22	---	1.0	---	0.0	1.0	1.0	10.0	16.0	26.0	25.0	25.0	15.0
23	8.0	---	---	0.0	0.0	1.0	9.0	12.0	28.0	27.0	---	15.0
24	7.0	---	---	0.0	3.0	1.0	11.0	15.0	25.0	24.0	22.0	---
25	7.0	1.0	---	0.0	3.0	2.0	---	14.0	---	20.0	21.0	19.0
26	4.0	1.0	---	0.0	---	2.0	8.0	17.0	26.0	21.0	22.0	11.0
27	3.0	---	---	0.0	1.0	3.0	5.0	18.0	21.0	19.0	24.0	11.0
28	2.0	1.0	---	0.0	1.0	5.0	5.0	---	23.0	---	24.0	11.0
29	2.0	---	0.0	0.0	---	3.0	7.0	17.0	---	16.0	25.0	---
30	2.0	---	---	0.0	---	5.0	10.0	18.0	23.0	22.0	---	---
31	1.0	---	0.0	0.0	---	7.0	---	16.0	---	22.0	---	---
AVG	F7.5	---	---	0.0	E0.5	H2.5	D8.0	G15.0	E22.0	C22.0	E24.0	C15.5

C Based on 25 days of data.

D Based on 26 days of data.

E Based on 27 days of data.

F Based on 28 days of data.

G Based on 29 days of data.

H Based on 30 days of data.

CHEYENNE RIVER BASIN

06438000 BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.

LOCATION.--Lat 44°22'11", long 102°33'56", in NE¼NE¼ sec.29, T.5 N., R.13 E., Meade County, at gaging station, on right bank 10 ft downstream from highway bridge, 4.3 miles northwest of Elm Springs, and 4.7 miles downstream from Hay Creek.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- SOLVED MAN- GANESE (MN) (UG/L) (000960)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)
OCT.								
14...	1030	62	250	220	120	181	--	1200
NOV.								
18...	1100	62	--	240	130	--	--	1400
DEC.								
15...	1100	26	--	350	180	--	--	2000
JAN.								
13...	1200	12	1900	510	260	410	34	601
FEB.								
10...	1300	47	--	140	110	--	--	1200
MAR.								
11...	1130	371	--	170	80	--	--	920
APR.								
14...	1230	1550	110	80	24	29	13	129
MAY								
13...	1200	1500	--	130	43	--	--	500
JUNE								
17...	1400	867	--	170	12	--	--	620
JULY								
22...	1100	306	10	180	82	95	12	157
AUG.								
12...	1030	314	--	200	83	--	--	840
SEP.								
16...	1200	241	--	200	78	--	--	890

DATE	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	PERCENT SODIUM (00932)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L) (00310)	TEMPER- ATURE (DEG C) (00010)
OCT.									
14...	353	1000	--	2.5	27	2240	8.2	1.8	8.0
NOV.									
18...	429	1200	--	--	--	2710	--	1.4	3.5
DEC.									
15...	247	1600	--	--	--	--	--	1.5	0.0
JAN.									
13...	143	2400	1900	3.7	27	4420	7.9	1.1	0.0
FEB.									
10...	270	820	--	--	--	2350	--	4.0	1.0
MAR.									
11...	1680	750	--	--	--	1970	7.8	2.6	2.0
APR.									
14...	2140	300	190	.7	17	712	7.9	5.9	12.5
MAY									
13...	3400	--	--	--	--	1130	7.7	2.5	13.5
JUNE									
17...	2620	--	--	--	--	1410	7.7	3.0	26.0
JULY									
22...	1070	790	660	1.5	21	1600	7.6	2.8	23.5
AUG.									
12...	1250	--	--	--	--	1730	8.1	2.2	24.5
SEP.									
16...	963	--	--	--	--	1770	7.9	--	12.0

CHEYENNE RIVER BASIN

57

06438000 BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.--Continued

DRAINAGE AREA.--7,210 sq mi, approximately.

PERIOD OF RECORD.--July 1969 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L) (00608)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (00300)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (00300)
OCT.									
14...	24	.5	1.5	--	.21	.060	350	2110	2.87
NOV.									
18...	39	--	6.8	--	.18	.090	--	2560	3.48
DEC.									
15...	51	--	6.9	--	.22	.060	--	3530	4.80
JAN.									
13...	60	.8	7.5	--	.72	.046	710	4410	6.00
FEB.									
10...	28	--	3.8	--	.44	.090	--	2130	2.90
MAR.									
11...	25	--	2.2	--	.34	.63	--	1680	2.28
APR.									
14...	4.6	.4	.40	--	.03	3.3	80	512	.70
MAY									
13...	8.2	--	.70	.70	.12	1.3	--	840	1.14
JUNE									
17...	7.7	--	.70	.86	.04	1.0	--	1120	1.52
JULY									
22...	13	.4	--	.39	.40	.090	250	1300	1.77
AUG.									
12...	13	--	.82	.82	.19	.10	--	1470	2.00
SEP.									
16...	15	--	1.3	1.3	.13	.11	--	1480	2.01

FIELD DETERMINATIONS

DATE	TIME	DIS- CHARGE (CFS) (00060)	TEMPER- ATURE (DEG C) (00010)	AIR TEMP- ERATURE (DEG C) (00020)	PH (UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	DIS- SOLVED OXYGEN (MG/L) (00300)	IMME- DIATE COLI- FORM (COL. PER 100 ML) (31501)	FECAL COLI- FORM (COL. PER 100 ML) (31616)
OCT.									
14...	1030	62	8.0	8.0	7.7	--	9.8	--	17
NOV.									
18...	1100	62	3.5	7.0	8.7	--	11.5	--	9
DEC.									
15...	1100	26	0.0	0.0	7.7	3670	12.9	--	--
JAN.									
13...	1200	12	0.0	-14.5	8.0	4280	7.5	--	--
FEB.									
10...	1300	47	1.0	5.0	7.4	2210	6.4	--	6
MAR.									
11...	1130	371	2.0	6.0	7.7	1780	11.5	--	--
APR.									
14...	1230	1550	12.5	15.5	7.7	733	6.9	--	88
MAY									
13...	1200	1500	13.5	27.5	8.1	1200	7.6	--	5000
JUNE									
17...	1400	867	26.0	29.0	8.0	1490	6.1	--	1200
AUG.									
12...	1030	314	24.5	31.5	8.2	--	9.5	--	80
SEP.									
16...	1200	241	12.0	13.0	8.4	--	9.8	--	463

CHEYENNE RIVER BASIN

06438000 BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED BERYL- LIUM (BE) (UG/L) (01010)	CYANIDE (CN) (MG/L) (00720)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COPPER (CU) (UG/L) (01040)
OCT. 14...	1030	8.0	62	40	0	.00	0	0	62
JAN. 13...	1200	0.0	12	40	0	.02	2	0	80
APR. 14...	1230	12.5	1550	20	0	.01	0	0	72
MAY 13...	1200	13.5	1500	--	--	.00	--	--	--
JULY 22...	1100	23.5	306	0	0	.00	0	--	7

DATE	DIS- SOLVED LEAD (PB) (UG/L) (01049)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L) (01060)	DIS- SOLVED NICKEL (NI) (UG/L) (01065)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS- SOLVED SILVER (AG) (UG/L) (01075)	DIS- SOLVED VANA- DIUM (V) (UG/L) (01085)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
OCT. 14...	0	.3	5	11	0	0	.0	10
JAN. 13...	0	.0	4	20	20	1	.5	40
APR. 14...	0	.0	11	7	4	1	.0	20
MAY 13...	--	--	--	--	--	--	--	--
JULY 22...	0	--	2	5	0	0	.0	10

PESTICIDE SAMPLES

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39340)	CHLOR- DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI- ELDRIN (UG/L) (39380)
OCT. 28...	1200	3.5	56	.00	.00	.0	.00	.00	.00	.00
JAN. 13...	1200	0.0	12	.00	.00	.0	.00	.00	.00	.00
APR. 14...	1330	12.5	1550	.00	.00	.0	.00	.00	.00	.00
JULY 22...	1100	23.5	306	.00	.00	.0	.00	.00	.00	.00

DATE	ENDRIN (UG/L) (39390)	HEPTA- CHLOR (UG/L) (39410)	HEPTA- CHLOR EPOXIDE (UG/L) (39420)	MALA- THION (UG/L) (39530)	PARA- THION (UG/L) (39540)	METHYL PARA- THION (UG/L) (39600)	DI- AZINON (UG/L) (39570)	2,4-D (UG/L) (39730)	2,4,5-T (UG/L) (39740)	SILVEX (UG/L) (39760)
OCT. 28...	.00	.00	.00	.00	.00	.00	--	.00	.00	.00
JAN. 13...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
APR. 14...	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
JULY 22...	.00	.00	.00	--	--	--	--	.10	.00	.00

MISSOURI RIVER MAIN STEM

59

06467500 MISSOURI RIVER AT YANKTON, S. DAK.

LOCATION.--Lat 42°51'58", long 97°23'27", in SW¼SW¼ sec.18, T.93 N., R.55 W., Yankton County, at gaging station, near left bank in downstream end of left pier of Meridian Highway Bridge on U.S. Highway 81, 5.0 miles downstream from Gavins Point Dam, 6.0 miles upstream from James River, and at mile 805.8.

DRAINAGE AREA.--279,500 sq mi, approximately.

PERIOD OF RECORD.--July 1969 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L) (00608)
OCT.									
13...	1015	43100	62	21	210	10	.10	--	.06
NOV.									
03...	1150	41900	57	21	210	11	.10	--	.04
DEC.									
23...	1130	15600	64	22	220	11	.20	--	.00
JAN.									
21...	1050	16000	65	22	220	11	.10	--	.04
FEB.									
26...	1230	17400	57	20	190	9.4	.30	--	.03
MAR.									
12...	1820	18200	70	21	220	13	.60	--	.02
APR.									
30...	1100	34700	50	20	200	9.6	.40	.40	.11
MAY									
26...	1100	54700	43	20	210	8.0	.17	.17	.15
JULY									
07...	1545	50000	16	22	220	9.1	.47	.47	.17
AUG.									
19...	1740	48800	63	22	220	9.0	.10	.12	.20
SEP.									
29...	1530	49200	58	21	220	6.4	.22	.22	.06

DATE	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT.								
13...	.043	483	.66	56200	240	742	--	9.5
NOV.								
03...	.020	492	.67	55700	230	730	--	6.5
DEC.								
23...	.010	511	.69	21500	250	762	--	0.0
JAN.								
21...	.020	519	.71	22400	250	735	--	1.0
FEB.								
26...	.050	446	.61	21000	220	671	--	1.5
MAR.								
12...	.030	528	.72	25900	260	779	--	6.5
APR.								
30...	.10	468	.64	43800	--	798	8.1	10.0
MAY								
26...	.060	450	.61	66500	--	711	8.0	14.0
JULY								
07...	.10	514	.70	69400	--	766	7.2	27.0
AUG.								
19...	.15	508	.69	66900	--	752	8.0	25.5
SEP.								
29...	.040	536	.73	71200	--	750	8.3	17.0

JAMES RIVER BASIN

06471000 JAMES RIVER AT COLUMBIA, S. DAK.

LOCATION.--Lat 45°37'04", long 98°19'31", in NE¼NW¼ sec.29, T.125 N., R.62 W., Brown County, at gaging station, on left bank 10 ft downstream from highway bridge, 0.8 mile northwest of Columbia, 2.4 miles upstream from Chicago and North Western Railway Co. bridge, 3.6 miles upstream from Elm River, and 9.0 miles downstream from Sand Lake.

DRAINAGE AREA.--7,050 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: June 1949 to September 1953 (miscellaneous), October 1954 to August 1964 (monthly), October 1966 to September 1971 (daily).

Water temperatures: October 1966 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 1,020 mg/l Apr. 8-15, 28-30; minimum, 430 mg/l Mar. 16-25.

Hardness: Maximum, 480 mg/l Apr. 8-15, 28-30; minimum, 210 mg/l Mar. 16-25.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SiO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
MAR. 16-25	2.1	--	--	--	46	23	39	8.4	105
APR. 08-13	12	--	--	--	99	57	150	8.6	260
28-30	12	--	--	--	99	57	150	8.6	260
MAY 01-31	56	--	--	--	78	46	100	16	306
JUNE 01-30	102	--	--	--	77	43	100	14	338
JULY 01-31	121	--	--	--	65	37	90	13	366
AUG. 01-31	86	20	--	--	63	38	97	14	401
SEP. 01-30	46	23	--	--	65	39	97	17	437
WTD. AVG. TIME WTD. AVG.	-- A74	--	--	--	69	40	96	14	365
TOT. LOAD (TONS)	--	--	--	--	2390	1380	3310	490	12500

ANALYSES OF ADDITIONAL SAMPLES

MAY 25...	62	8.7	--	--	82	48	110	8.0	328
JUNE 15...	109	18	--	--	90	42	91	14	348
JULY 09...	139	22	30	160	62	37	92	13	342
AUG. 09...	95	--	--	--	62	39	95	14	394
SEP. 03...	87	28	--	--	60	37	97	17	428

A Mean discharge for 172 days of chemical analysis; mean discharge for 365 days, 35 cfs.

JAMES RIVER BASIN

61

06471000 JAMES RIVER AT COLUMBIA, S. DAK.--Continued

EXTREMES.--1970-71:--Continued

Specific conductance: Maximum daily, 1,550 micromhos Apr. 12; minimum daily, 465 micromhos Mar. 19.
 Water temperatures: Maximum, 28.0° June 13, 18-20, 23, July 3; minimum, 1.0°C Mar. 22.

Period of record:

Dissolved solids (1966-69, 1970-71): Maximum, 1,190 mg/l Dec. 19-21, 1967; minimum, 339 mg/l Apr. 5-21, 1967.

Hardness (1966-69, 1970-71): Maximum, 503 mg/l Dec. 19-21, 1967; minimum, 175 mg/l Mar. 10-13, 1968.

Specific conductance (1966-71): Maximum daily, 1,720 micromhos Feb. 19, 25, 1967; minimum daily, 465 micromhos Mar. 19, 1971.

Water temperatures (1966-71): Maximum, 32.0°C June 29, July 10, 1970; minimum, freezing point on many days during winter period.

REMARKS.--Daily samples for chemical analysis composited by discharge. No flow Oct. 1 to Mar. 15, Mar. 26 to Apr. 7, Apr. 14-27. Prior to October 1966, sampling site was 5.0 miles upstream, and prior to October 1957, published as "near Columbia."

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED RESI- DUE AT (MG/L) (70300)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)
MAR. 16-25	180	22	--	2.0	--	.80	190	430	--
APR. 08-13	510	70	--	.78	--	.30	230	1020	--
28-30	510	70	--	.78	--	.30	230	1020	--
MAY 01-31	310	58	--	.72	--	.19	280	842	--
JUNE 01-30	240	43	--	.18	--	.34	370	738	--
JULY 01-31	170	36	--	.19	--	.51	310	634	--
AUG. 01-31	150	35	.3	.60	.52	.65	310	--	619
SEP. 01-30	160	38	.4	.57	.36	.49	340	--	658
WTD. AVG. TIME WTD. AVG.	203	41	--	.39	--	.45	323	--	--
TOT. LOAD (TONS)	220 220 6990	42 1410	--	.56 14	--	.44 16	309 309 11	--	--

ANALYSES OF ADDITIONAL SAMPLES

MAY 25...	320	52	.3	.30	.20	.23	240	--	793
JUNE 15...	240	45	.3	.02	.37	.40	360	--	713
JULY 09...	180	38	.3	.00	.42	.50	360	--	615
AUG. 09...	150	36	--	.00	--	.62	310	640	--
SEP. 03...	120	42	.5	.01	.57	.74	340	--	614

JAMES RIVER BASIN

06471000 JAMES RIVER AT COLUMBIA, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1973

DATE	CIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
MAR. 16-25	0.58	2.41	210	120	1.2	648	7.3	--
APR. 08-13	1.39	31.8	480	270	3.0	1480	7.4	--
28-30	1.39	31.8	480	270	3.0	1480	7.4	--
MAY 01-31	1.15	127	380	130	2.2	1270	7.7	--
JUNE 01-30	1.00	203	370	92	2.3	1050	7.7	--
JULY 01-31	.86	207	310	14	2.2	968	7.8	--
AUG. 01-31	.84	144	310	0	2.4	959	8.3	--
SEP. 01-30	.89	81.7	320	0	2.3	987	8.1	--
WTD. AVG. TIME WTD. AVG.	.94	167	336	46	2.3	1030	7.9	--
TOT. LOAD (TONS)	.95	138	338	63	2.3	1050	7.9	--
	--	--	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

MAY 25...	1.15	133	400	130	2.4	1180	7.8	10.5
JUNE 15...	.97	210	400	110	2.0	1100	7.2	26.5
JULY 09...	.84	231	310	27	2.3	940	7.8	--
AUG. 09...	.87	164	320	0	2.3	965	7.6	25.0
SEP. 03...	.84	144	300	0	2.4	975	7.5	--

JAMES RIVER BASIN

63

06471000 JAMES RIVER AT COLUMBIA, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	1360	1220	970	898	895
2	---	---	---	---	---	---	---	1360	1130	965	922	880
3	---	---	---	---	---	---	---	1290	1140	960	907	878
4	---	---	---	---	---	---	---	1290	1120	960	904	825
5	---	---	---	---	---	---	---	1280	1100	950	896	837
6	---	---	---	---	---	---	---	1290	1100	945	920	838
7	---	---	---	---	---	---	---	1300	1100	930	915	873
8	---	---	---	---	---	---	---	1290	1090	925	930	858
9	---	---	---	---	---	---	820	1290	1110	920	920	878
10	---	---	---	---	---	---	1510	1250	1110	850	909	877
11	---	---	---	---	---	---	1510	1260	1090	850	935	867
12	---	---	---	---	---	---	1550	---	1100	860	920	870
13	---	---	---	---	---	---	1530	1260	1090	890	923	915
14	---	---	---	---	---	---	---	1280	1100	900	935	905
15	---	---	---	---	---	---	---	1250	1100	910	935	918
16	---	---	---	---	---	850	---	1260	1100	990	946	918
17	---	---	---	---	---	470	---	1230	1100	900	942	928
18	---	---	---	---	---	500	---	1230	1090	910	950	930
19	---	---	---	---	---	465	---	1250	1080	910	940	945
20	---	---	---	---	---	480	---	1280	1070	910	931	961
21	---	---	---	---	---	480	---	1230	1050	905	950	925
22	---	---	---	---	---	660	---	1250	1080	910	962	950
23	---	---	---	---	---	650	---	1250	1040	900	962	898
24	---	---	---	---	---	610	---	1190	1020	915	955	975
25	---	---	---	---	---	625	---	1190	1020	920	975	978
26	---	---	---	---	---	---	---	1210	1020	915	961	983
27	---	---	---	---	---	---	---	1190	1020	910	938	948
28	---	---	---	---	---	---	---	1420	1180	1020	910	1030
29	---	---	---	---	---	---	---	1380	1170	1010	910	1010
30	---	---	---	---	---	---	---	1340	1170	1000	910	1040
31	---	---	---	---	---	---	---	1140	---	905	990	---
AVG	---	---	---	---	---	---	---	B1250	1080	917	937	918

B Based on 30 days of data.

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	9.0	13.0	23.0	19.0	20.0
2	---	---	---	---	---	---	---	14.0	20.0	25.0	21.0	27.0
3	---	---	---	---	---	---	---	9.0	20.0	28.0	21.0	23.0
4	---	---	---	---	---	---	---	14.0	22.0	24.0	20.0	21.0
5	---	---	---	---	---	---	---	16.0	22.0	26.0	20.0	22.0
6	---	---	---	---	---	---	---	19.0	20.0	26.0	19.0	21.0
7	---	---	---	---	---	---	---	18.5	19.0	24.0	21.0	20.0
8	---	---	---	---	---	---	11.0	12.0	21.0	25.0	20.0	21.0
9	---	---	---	---	---	---	11.0	16.0	19.0	25.0	19.0	20.0
10	---	---	---	---	---	---	8.0	17.0	19.0	25.0	19.0	19.0
11	---	---	---	---	---	---	9.0	14.0	22.0	23.0	19.0	18.0
12	---	---	---	---	---	---	9.0	12.0	22.0	24.0	20.0	17.0
13	---	---	---	---	---	---	8.0	11.0	28.0	25.0	21.0	18.0
14	---	---	---	---	---	---	---	21.0	23.0	25.0	22.0	18.0
15	---	---	---	---	---	---	---	17.0	25.0	25.0	23.0	16.0
16	---	---	---	---	---	4.0	---	15.0	26.0	27.0	27.0	14.0
17	---	---	---	---	---	4.0	---	20.0	23.0	25.0	28.0	12.0
18	---	---	---	---	---	3.0	---	15.0	28.0	21.0	28.0	10.0
19	---	---	---	---	---	3.0	---	12.0	28.0	19.0	25.0	15.0
20	---	---	---	---	---	2.0	---	15.0	28.0	21.0	21.0	15.0
21	---	---	---	---	---	3.0	---	15.0	26.0	21.0	24.0	11.0
22	---	---	---	---	---	1.0	---	15.0	27.0	22.0	25.0	12.0
23	---	---	---	---	---	3.5	---	11.0	28.0	21.0	25.0	13.0
24	---	---	---	---	---	3.0	---	14.0	27.0	22.0	23.0	15.0
25	---	---	---	---	---	2.0	---	14.0	23.0	20.0	23.0	14.0
26	---	---	---	---	---	---	---	15.0	25.0	20.0	23.0	13.0
27	---	---	---	---	---	---	---	19.0	23.0	21.0	22.0	15.0
28	---	---	---	---	---	---	5.0	19.0	25.0	20.0	23.0	15.0
29	---	---	---	---	---	---	5.0	19.0	23.0	17.0	23.0	15.0
30	---	---	---	---	---	---	6.0	15.0	24.0	19.0	26.0	12.0
31	---	---	---	---	---	---	---	15.0	---	19.0	21.0	---
AVG	---	---	---	---	---	---	---	15.0	23.5	23.0	22.5	16.5

JAMES RIVER BASIN

06476000 JAMES RIVER AT HURON, S. DAK.
(Irrigation network station)

LOCATION.--Lat 44°21'49", long 98°11'56", in SW¼SE¼NE¼ sec.6, T.110 N., R.61 W., Beadle County, at gaging station, on right bank 15 ft upstream from city dam at Huron, 135 ft downstream from Chicago and North Western Transportation Co. bridge, and 165 ft upstream from bridge on business loop U.S. Highway 14.

DRAINAGE AREA.--16,800 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: April 1950 to September 1951, August 1956 to September 1971.
Water temperatures: August 1956 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 1,530 mg/l Feb. 1-28; minimum, 456 mg/l Mar. 1-31.
Hardness: Maximum, 618 mg/l Feb. 1-28; minimum, 250 mg/l Mar. 1-31.

Period of record:

Dissolved solids (1956-58, 1959-68, 1970-71): Maximum, 2,180 mg/l Mar. 1-20, 1965; minimum, 147 mg/l Apr. 5-7, 1960.

Hardness (1956-58, 1959-68, 1970-71): Maximum, 963 mg/l Mar. 1-20, 1965; minimum, 63 mg/l Apr. 1-4, 1960.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SiO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT.									
01-31	.00	--	--	--	78	44	182	25	355
NOV.									
01-30	1.6	--	--	--	80	45	175	24	354
DEC.									
01-31	1.9	--	--	--	78	52	192	24	342
JAN.									
01-31	.00	--	--	--	83	54	195	22	325
FEB.									
01-28	3.9	--	--	--	114	81	248	25	442
MAR.									
01-31	111	--	--	--	49	31	49	7.9	192
APR.									
01-30	58	--	--	--	59	31	110	7.8	259
MAY									
01-31	31	--	--	--	57	31	110	15	228
JUNE									
01-30	56	--	--	--	80	40	120	16	313
JULY									
01-31	96	--	--	--	86	44	140	19	349
AUG.									
01-31	49	--	--	--	82	44	120	18	391
SEP.									
01-30	53	14	--	--	70	41	110	17	371
WTD. AVG.									
TIME WTD.	--	--	--	--	69	38	105	14	295
AVG.	39	--	--	--	76	45	145	18	326
TOT. LOAD (TONS)	--	--	--	--	2640	1450	4030	537	11300

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
13...	A.00	19	43	1300	87	48	16	22	354
DEC.									
30...	A.00	18	20	1000	99	66	200	25	392
MAR.									
01...	A6.0	20	107	6800	162	97	281	27	520
16...	A411	7.4	207	740	39	16	41	15	115
JUNE									
14...	A51	--	--	--	88	47	120	17	--

A Discharge at time of sampling.

JAMES RIVER BASIN

65

06476000 JAMES RIVER AT HURON, S. DAK.--Continued

EXTREMES:--Continued

Period of record:--Continued

Specific conductance (1956-70): Maximum daily, 3,170 micromhos Mar. 14, 1965; minimum daily, 176 micromhos Mar. 30, Apr. 2, 1960.

Water temperatures (1956-70): Maximum, 31.0°C June 2, 1968; minimum, freezing point on many days during winter period.

REMARKS:--Daily samples for chemical analysis composited by discharge. Samples during periods of no-flow at gage are composited by equal volume. Flow regulated by Arrowwood and Jim Lakes, and by Jamestown reservoir (combined capacity, 246,000 acre-ft). Regulation by Jamestown reservoir (capacity, 229,470 acre-ft), 365 miles upstream since May 1953. The City of Huron and Armour and Company divert water from the river immediately upstream from the gage. Average daily pumpage was about 5.0 cfs. At times the diversion exceeds the flow in the river. No flow Oct. 1 to Nov. 26, Dec. 30 to Feb. 17. Maximum observed during water year: Dissolved solids, 1,750 mg/l Mar. 1; hardness, 804 mg/l Mar. 1; specific conductance, 2,480 micromhos Mar. 11; water temperature, 30.0°C June 18, 25-26. Minimum observed during water year: Dissolved solids, 336 mg/l Mar. 16; hardness, 164 mg/l Mar. 16; specific conductance, 519 micromhos Mar. 16; water temperature, 0.0°C on many days during November to February. Additional samples were collected for more comprehensive definition of water quality. Records of specific conductance of daily samples prior to Oct. 1, 1964, on file in district office. Miscellaneous samples for chemical data published for water years 1949, 1952.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO- PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	391	94	--	.27	--	--	--	--	1040
NOV.									
01-30	385	92	--	.85	--	--	--	--	1020
DEC.									
01-31	438	105	--	.65	--	--	--	--	1120
JAN.									
01-31	481	101	--	1.0	--	--	--	--	1150
FEB.									
01-28	629	133	.6	1.6	--	--	--	634	1530
MAR.									
01-31	170	32	--	--	.73	--	.52	200	456
APR.									
01-30	190	80	--	--	.71	--	.40	30	642
MAY									
01-31	240	57	--	--	.65	--	.20	260	636
JUNE									
01-30	270	70	--	--	.84	--	.45	410	786
JULY									
01-31	290	74	--	--	.71	--	.61	520	890
AUG.									
01-31	250	57	--	--	.45	--	.31	410	800
SEP.									
01-30	220	53	.5	--	.78	.19	.26	350	--
WTD. AVG.	234	59	--	--	--	--	--	--	B700
TIME WTD.									
AVG.	328	79	--	--	--	--	--	--	911
TOT. LOAD (TONS)	8960	2270	--	--	--	--	--	--	B23800

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
13...	394	93	.4	.54	--	--	--	524	1140
DEC.									
30...	480	114	.3	1.6	--	--	--	544	1220
MAR.									
01...	765	148	.5	1.5	--	--	--	726	1750
16...	135	17	.2	.91	--	--	--	144	336
JUNE									
14...	--	--	--	--	--	--	.34	330	866

B Based on 335 days of chemical analysis.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

ANALYSES OF ADDITIONAL SAMPLES

PESTICIDE SAMPLES[illegible]

JAMES RIVER BASIN

67

06476000 JAMES RIVER AT HURON, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	1580	---	---	1920	---	1040	910	1090	---	1270	1070
2	---	1580	---	---	2080	2150	---	---	1090	1210	1260	1090
3	---	1580	1730	---	1870	2250	1030	870	1100	---	1250	1080
4	---	1580	---	---	2050	---	1020	860	1100	---	1240	1060
5	---	1590	1600	---	2030	---	---	860	---	1170	1240	1060
6	---	1570	1800	---	---	2370	---	---	1120	---	1230	1050
7	---	1520	1660	---	2100	2400	1180	870	1140	---	1230	1050
8	---	1520	1660	---	---	2340	---	890	1160	1150	1220	1060
9	---	1540	1650	---	---	2400	1180	890	1160	1170	1210	1040
10	---	---	---	---	2140	2400	---	---	1180	1190	1160	1030
11	---	1540	1670	---	2180	2480	1310	---	1200	---	1190	1030
12	---	1550	---	---	---	2300	1290	---	1230	---	1180	1020
13	---	1560	1750	1620	---	---	1220	---	1230	---	1180	1040
14	---	---	1720	---	2130	---	1220	890	1240	---	1170	1040
15	---	1630	---	---	2200	580	---	---	---	1390	1160	1030
16	---	1630	1630	---	2120	565	1220	---	1240	---	1160	1030
17	---	1570	---	---	2100	590	1240	---	1230	---	1160	1040
18	---	---	1760	---	---	---	---	---	1210	1400	1170	1030
19	---	1520	1680	2040	---	890	1300	---	---	1400	1150	1050
20	---	1570	1800	---	---	890	---	910	1200	---	1150	1050
21	---	---	---	---	2120	980	1280	940	1160	1350	1150	1050
22	---	---	1860	---	2170	975	1280	940	1150	1370	1140	1060
23	---	1600	---	---	2180	990	---	910	1140	1370	1140	1050
24	---	---	---	---	2260	1040	1230	940	1140	1370	1160	1060
25	---	1650	1600	---	2230	---	1340	950	1140	1360	1160	1060
26	---	---	---	---	---	---	---	---	1140	1340	1160	1070
27	---	---	1600	---	2350	1050	---	970	1140	1320	1160	1070
28	---	---	1720	2100	2380	1060	1170	980	1140	1300	1170	1080
29	---	1630	---	---	---	1080	1170	---	1160	1270	1180	1080
30	---	---	1750	---	---	1070	1050	---	1180	1260	1170	1080
31	---	---	---	---	---	890	---	---	---	1260	1160	---
AVG	---	---	---	---	---	---	---	---	C 1160	---	1180	1050

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	5.0	---	0.0	0.0	---	3.0	15.0	18.0	---	19.0	21.0
2	---	4.0	---	0.0	0.0	0.5	---	---	23.5	25.0	20.0	22.0
3	---	3.5	2.0	0.0	0.0	0.5	3.0	18.5	26.0	---	20.0	24.0
4	---	3.0	---	0.0	0.5	---	2.5	18.5	20.0	---	20.0	28.0
5	---	1.5	1.5	0.0	0.0	---	---	18.0	---	27.0	21.0	21.0
6	---	3.5	1.5	0.0	0.0	1.0	---	---	24.0	---	22.0	20.0
7	---	4.0	3.0	0.0	0.0	1.0	10.0	20.0	25.0	---	22.0	20.0
8	---	4.0	3.0	0.0	0.0	1.0	---	20.0	26.0	25.0	22.0	20.0
9	---	4.0	2.0	0.0	0.0	1.0	10.0	19.0	21.0	25.0	23.0	18.0
10	---	---	---	0.0	0.0	1.0	---	---	27.0	27.0	23.0	18.0
11	---	1.5	1.5	0.0	0.0	1.0	10.0	---	26.0	---	22.0	18.0
12	---	1.0	---	0.0	0.0	1.0	10.0	---	28.5	---	22.0	19.0
13	---	2.0	1.5	0.0	0.0	---	---	---	28.0	---	23.0	18.0
14	---	---	2.0	0.0	0.0	---	---	19.0	28.5	---	23.0	18.0
15	---	3.0	---	0.0	0.0	0.5	---	---	---	28.0	22.0	17.0
16	---	0.0	2.0	0.0	0.0	1.0	14.0	---	27.0	---	24.0	15.0
17	---	0.0	---	0.0	0.0	1.0	14.0	---	28.5	---	25.0	15.0
18	---	---	1.0	0.0	0.0	---	---	---	30.0	24.0	25.0	14.0
19	---	2.0	0.5	0.0	---	1.0	16.5	---	---	22.0	24.0	14.0
20	---	2.0	0.5	0.0	---	1.0	---	18.0	28.0	---	24.0	14.0
21	---	---	---	0.0	1.0	1.0	18.0	18.0	29.5	24.0	25.0	14.0
22	---	---	0.0	0.0	1.0	1.0	18.0	18.0	28.5	26.0	25.0	13.0
23	---	0.0	0.0	0.0	1.5	1.0	---	17.5	29.0	24.0	25.0	12.0
24	---	---	0.0	0.0	2.5	1.0	14.0	12.5	28.5	24.0	---	12.0
25	---	1.0	0.0	0.0	2.5	---	14.0	13.0	30.0	24.0	23.0	13.0
26	---	---	0.0	0.0	---	---	---	---	30.0	20.0	23.0	14.0
27	---	---	0.0	0.0	1.5	2.0	---	18.0	28.5	21.0	22.0	14.0
28	---	---	0.0	0.0	1.5	2.0	9.0	18.0	25.0	19.0	21.0	16.0
29	---	0.0	0.0	0.0	---	4.5	9.0	---	25.0	18.0	21.0	15.0
30	---	---	0.0	0.0	---	4.5	15.0	---	25.0	18.0	22.0	17.0
31	---	---	0.0	0.0	---	3.0	---	---	---	19.0	21.0	---
AVG	---	---	---	0.0	0.5	---	---	---	C 26.5	---	D 22.5	17.0

C Based on 27 days of data.

D Based on 30 days of data.

JAMES RIVER BASIN

06478000 JAMES RIVER NEAR MITCHELL, S. DAK.

LOCATION.--Lat 43°41'36", long 97°57'54", in NW¼SW¼ sec.30, T.103 N., R.59 W., Hanson County, 9 miles upstream from gaging station, on left bank 50 ft downstream from bridge on Interstate 90, 0.2 mile downstream from Firesteel Creek, and 3.0 miles southeast of Mitchell.

DRAINAGE AREA.--19,800 sq mi, approximately (at gaging station).

PERIOD OF RECORD.--Chemical analyses: October 1968 to September 1971.

Water temperatures: October 1968 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 2,140 mg/l Jan. 1-31; minimum, 402 mg/l Mar. 1-31.

Hardness: Maximum, 850 mg/l Jan. 1-31; minimum, 180 mg/l Mar. 1-31.

Period of record:

Dissolved solids (1968-69, 1970-71): Maximum, 2,140 mg/l Jan. 1-31, 1971; minimum, 215 mg/l Apr. 4-30, 1969.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SiO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 01-31	4.1	--	--	--	96	63	210	31	239
NOV. 01-30	12	--	--	--	130	69	253	22	313
DEC. 01-31	14	--	--	--	150	80	290	21	384
JAN. 01-31	3.4	--	--	--	160	110	360	9.9	406
FEB. 01-28	17	--	--	--	120	74	270	20	372
MAR. 01-31	625	--	--	--	44	16	46	12	152
APR. 01-30	158	--	--	--	72	38	130	15	244
MAY 01-31	83	--	--	--	85	45	150	14	308
JUNE 01-30	64	--	--	--	85	44	150	16	336
JULY 01-31	99	--	--	--	86	46	140	18	324
AUG. 01-31	55	11	--	--	81	48	160	19	349
SEP. 01-30	47	9.6	--	--	71	48	130	18	344
WTD. AVG.	--	--	--	--	63	30	96	14	224
TIME WTD. AVG.	100	--	--	--	98	57	191	18	314
TOT. LOAD (TONS)	--	--	--	--	6150	2960	9390	1390	22000

ANALYSES OF ADDITIONAL SAMPLES

DEC. 30...	B5.5	19	20	380	200	110	332	27	444
FEB. 26...	B25	15	300	1200	97	48	182	33	284
MAR. 12...	B60	9.5	320	400	57	25	66	15	162
MAY 25...	B80	12	--	--	89	49	150	8.4	332
AUG. 19...	B39	9.6	--	--	81	50	150	20	364

B Discharge at time of sampling.

JAMES RIVER BASIN

69

06478000 JAMES RIVER NEAR MITCHELL, S. DAK.--Continued

EXTREMES.--Continued

Period of record:--Continued

Hardness (1968-69, 1970-71): Maximum, 850 mg/l Jan. 1-31, 1971; minimum, 101 mg/l Apr. 4-30, 1969.

Specific conductance (1968-69): Maximum daily, 2,440 micromhos Dec. 27, 1968; minimum daily, 220 micromhos Apr. 10, 1969.

Water temperatures (1968-69): Maximum, 32.0°C July 15-16, 1969, July 30, 1970; minimum, freezing point on many days during winter period.

REMARKS.--No appreciable inflow between sampling point and gaging station except during periods of intense precipitation. Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Dissolved solids, 2,200 mg/l Dec. 30; hardness, 930 mg/l Dec. 30; specific conductance, 2,900 micromhos Dec. 26, 27; water temperature, 30.0°C June 21, 25-26, Aug. 21. Minimum observed during water year: Specific conductance, 370 micromhos Mar. 15; water temperature, freezing point Jan. 26 to Feb. 9. Additional samples were collected for more comprehensive definition of water quality.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SULFATE (SO ₄) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED ORTHO. PHOS- PHORUS (P) (MG/L) (00671)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	600	130	--	--	1.7	--	.55	680	1300
NOV.									
01-30	760	110	.4	.60	--	--	--	830	1570
DEC.									
01-31	830	130	.3	.70	--	--	--	930	1790
JAN.									
01-31	870	260	--	--	1.2	--	.32	820	2140
FEB.									
01-28	590	160	--	--	2.4	--	.80	780	1580
MAR.									
01-31	110	23	--	--	2.7	--	.80	200	402
APR.									
01-30	300	72	--	--	1.6	--	.60	400	802
MAY									
01-31	390	82	.3	--	.99	--	.55	500	976
JUNE									
01-30	340	82	--	--	1.5	--	1.1	470	926
JULY									
01-31	330	81	--	--	1.0	--	.68	590	930
AUG.									
01-31	360	76	.4	--	1.1	.020	.24	500	--
SEP.									
01-30	310	66	.3	--	.06	.080	.15	450	--
WTD. AVG.	230	51	--	--	A2.0	--	A.70	345	A640
TIME WTD.									
AVG.	483	106	--	--	A1.4	--	A.58	595	A1240
TOT. LOAD (TONS)	22600	4980	--	--	A194	--	A68	34	A57300

ANALYSES OF ADDITIONAL SAMPLES

DEC.									
30...	970	200	.6	1.0	--	--	--	930	2200
FEB.									
26...	470	110	.6	4.0	--	--	1.4	570	1150
MAR.									
12...	220	25	.2	1.6	--	--	--	360	515
MAY									
25...	370	62	.4	--	.02	.10	.46	510	--
AUG.									
19...	330	5.5	.4	--	.02	.040	.050	570	--

A Based on 304 days of chemical analysis.

JAMES RIVER BASIN

06478000 JAMES RIVER NEAR MITCHELL, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

WATER QUALITY DATA, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TGNS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT.									
01-31	--	1.77	14.4	500	300	4.1	1810	8.0	--
NOV.									
01-30	--	2.14	50.9	600	350	4.5	2040	7.8	--
DEC.									
01-31	--	2.43	67.7	690	370	4.8	2290	7.9	--
JAN.									
01-31	--	2.91	19.6	850	520	5.4	2970	7.9	--
FEB.									
01-28	--	2.15	72.5	600	300	4.8	2180	8.1	--
MAR.									
01-31	--	.55	678	180	51	1.5	564	7.6	--
APR.									
01-30	--	1.09	342	340	140	3.1	1230	7.6	--
MAY									
01-31	--	1.33	219	400	140	3.3	1460	7.7	--
JUNE									
01-30	--	1.26	160	390	120	3.3	1400	7.6	--
JULY									
01-31	--	1.26	249	400	140	3.0	1400	7.5	--
AUG.									
01-31	932	1.27	138	400	10	3.5	1420	8.1	--
SEP.									
01-30	826	1.12	105	380	93	2.7	1250	8.2	--
WTD. AVG.	--	.90	465	283	97	2.3	964	7.7	--
TIME WTD.									
AVG.	--	1.60	177	477	220	3.7	1670	7.8	--
TOT. LOAD (TONS)	--	--	45500	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

DEC.									
30...	2080	2.99	32.7	930	570	4.7	2490	8.2	.0
FEB.									
26...	1110	1.56	77.6	440	200	3.8	1600	8.0	.0
MAR.									
12...	504	.70	83.4	240	110	1.8	769	8.0	1.0
MAY									
25...	905	1.23	195	420	150	3.2	1390	7.5	12.0
AUG.									
19...	826	1.12	87.0	410	110	3.2	930	8.2	24.5

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	HEXA- VALENT CHRO- MIUM (CR6) (UG/L) (01032)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED LEAD (PB) (UG/L) (01049)	TOTAL MERCURY (HG) (UG/L) (71900)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
OCT.										
12...	1120	8.5	3	12	0	0	0	0	.4	27

JAMES RIVER BASIN

71

06478000 JAMES RIVER NEAR MITCHELL, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	2080	2180	---	---	1280	880	1440	1560	1420	---	1330
2	---	2060	2360	---	---	1290	740	1490	1640	1410	---	1290
3	---	2080	2550	---	---	1830	670	1400	1620	1260	1330	1300
4	---	2080	2530	---	---	1790	870	1450	1620	1240	1410	1300
5	---	2060	2530	---	---	1800	810	1400	1500	1250	1480	1310
6	---	2380	2500	---	---	1780	900	1440	1500	1270	1470	1300
7	---	2060	2200	---	---	1810	1080	1460	1430	1260	1400	1300
8	---	2010	2200	---	---	1820	1090	1450	1420	1260	1430	1230
9	---	2050	2240	---	---	1750	1090	1450	1430	1280	1430	1210
10	---	2130	2250	---	---	1740	1080	1440	1340	1260	1420	1240
11	---	2200	2250	---	---	1750	1080	1400	1340	1260	1450	1250
12	---	2360	2370	---	---	1740	1030	1430	1360	1260	1400	1220
13	---	2360	2250	---	---	1740	1050	1400	1330	1240	1380	1250
14	---	2360	2280	---	---	420	1380	1460	1310	1280	1390	1270
15	---	2370	2130	---	---	370	1430	1460	1320	1260	1400	1240
16	---	2380	2320	---	---	425	1380	1460	1310	1260	1380	1250
17	---	2340	2280	---	---	425	1260	1430	1330	1280	1400	1190
18	---	2170	1620	---	---	455	1170	1460	1320	1270	1380	1180
19	---	2200	2450	---	---	460	1180	1460	1290	1270	1380	1210
20	---	2240	2680	---	---	485	1240	1460	1290	1270	1380	1110
21	---	2150	2600	---	---	420	1230	1460	1280	1270	1380	1200
22	---	2150	2180	---	---	415	1320	1450	1310	1280	1380	1170
23	---	2220	2700	---	---	425	1330	1430	1190	1320	1390	1190
24	---	2300	2650	---	---	420	1330	1360	1180	1370	1420	1200
25	---	2320	2670	---	---	590	1380	1370	1160	1380	1410	1200
26	---	2380	2900	---	---	595	1390	1370	1170	1420	1400	1130
27	---	2360	2900	---	---	600	1390	1370	1160	1450	1390	1160
28	---	2700	2870	---	---	590	1380	1420	1290	1450	1390	1150
29	---	2650	2870	---	---	640	1420	1490	1320	1430	1370	1180
30	---	2300	2800	---	---	640	1420	1360	1270	1440	1360	1170
31	---	---	2850	---	---	760	---	1490	---	1430	---	---
AVG	---	2240	2460	---	---	1010	1170	1430	1350	1320	1400	1220

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.0	4.0	---	---	0.0	2.0	6.0	15.0	---	29.0	25.0	26.0
2	18.0	4.0	---	---	0.0	2.0	5.0	15.0	---	28.0	25.0	26.0
3	17.0	4.0	---	---	0.0	2.0	6.0	15.0	---	28.0	25.0	26.0
4	18.0	5.0	---	---	0.0	1.0	7.0	16.0	---	27.0	25.0	24.0
5	20.0	5.0	---	---	0.0	1.0	7.0	16.0	---	28.0	25.0	25.0
6	21.0	7.0	---	---	0.0	1.0	8.0	17.0	---	27.0	25.0	26.0
7	21.0	6.0	---	---	0.0	1.0	9.0	18.0	---	25.0	25.0	25.0
8	16.0	5.0	---	---	0.0	1.0	9.0	19.0	---	21.0	25.0	---
9	---	5.0	---	1.0	0.0	1.0	10.0	19.0	---	27.0	25.0	---
10	---	6.0	---	1.0	1.0	1.0	11.0	18.0	---	27.0	25.0	---
11	---	6.0	---	1.0	1.0	1.0	11.0	18.0	---	27.0	25.0	---
12	---	5.0	---	1.0	1.0	2.0	13.0	19.0	28.0	27.0	27.0	---
13	---	4.0	---	1.0	1.0	2.0	13.0	19.0	28.0	27.0	28.0	---
14	---	4.0	---	1.0	2.0	2.0	13.0	20.0	28.0	28.0	28.0	---
15	---	3.0	---	1.0	2.0	3.0	14.0	20.0	28.0	28.0	28.0	---
16	---	3.0	---	1.0	2.0	3.0	14.0	21.0	28.0	29.0	28.0	---
17	12.0	4.0	---	1.0	2.0	4.0	15.0	21.0	22.0	29.0	28.0	---
18	12.0	4.0	---	1.0	2.0	4.0	16.0	22.0	22.0	28.0	26.0	---
19	12.0	4.0	---	1.0	2.0	4.0	17.0	21.0	24.0	28.0	26.0	---
20	13.0	4.0	---	1.0	2.0	4.0	18.0	21.0	28.0	29.0	26.0	---
21	15.0	4.0	---	1.0	2.0	4.0	18.0	22.0	30.0	28.0	30.0	---
22	15.0	3.0	---	1.0	2.0	5.0	17.0	---	28.0	29.0	28.0	---
23	12.0	1.0	---	1.0	2.0	5.0	17.0	---	28.0	28.0	30.0	---
24	13.0	1.0	---	1.0	2.0	6.0	16.0	---	29.0	26.0	27.0	---
25	13.0	1.0	---	1.0	2.0	6.0	15.0	---	30.0	28.0	26.0	---
26	11.0	1.0	---	0.0	2.0	7.0	15.0	---	30.0	29.0	25.0	---
27	10.0	2.0	---	0.0	2.0	8.0	14.0	---	30.0	25.0	24.0	---
28	8.0	2.0	---	0.0	2.0	8.0	14.0	---	28.0	21.0	24.0	---
29	6.0	3.0	---	0.0	---	9.0	14.0	---	26.0	20.0	24.0	---
30	6.0	---	---	0.0	---	9.0	15.0	---	27.0	23.0	24.0	---
31	5.0	---	---	0.0	---	8.0	---	---	---	24.0	26.0	---
AVG	---	4.0	---	---	1.0	4.0	12.5	---	---	26.5	26.0	---

JAMES RIVER BASIN

06478500 JAMES RIVER NEAR SCOTLAND, S. DAK.

LOCATION.--Lat 43°11'00", long 97°37'57", in SW¼SW¼ sec.30, T.97 N., R.57 W., Hutchinson County, at gaging station, on left bank 50 ft upstream from highway bridge, 500 ft upstream from Dawson Creek, and 5.0 miles northeast of Scotland.

DRAINAGE AREA.--21,550 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: August 1956 to September 1964, July 1967 to September 1971.
Water temperatures: January 1953 to September 1969.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)
OCT.									
13...	1115	12	990	160	70	148	--	--	660
NOV.									
03...	1310	23	--	190	66	--	--	--	750
DEC.									
23...	1330	24	--	250	99	--	--	--	960
JAN.									
21...	1330	15	2000	310	110	232	30	458	1100
FEB.									
26...	1500	70	--	88	34	--	--	--	310
MAR.									
12...	1630	95	--	130	47	--	--	--	480
APR.									
30...	1300	178	1300	140	53	73	14	264	460
MAY									
26...	1400	117	--	130	67	--	--	--	470
JULY									
07...	1300	90	--	140	57	--	--	--	480
AUG.									
19...	1400	65	710	120	55	170	21	343	460
SEP.									
29...	1255	63	--	110	57	--	--	--	500

DATE	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L) (00608)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70360)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)
OCT.									
13...	67	.5	.00	--	.12	.17	510	1350	1.84
NOV.									
03...	54	--	.00	--	.04	.11	--	1500	2.04
DEC.									
23...	80	--	.10	--	.10	.080	--	1880	2.56
JAN.									
21...	110	1.1	.20	--	1.6	1.2	690	2270	3.09
FEB.									
26...	32	--	1.3	--	1.9	1.4	--	686	.93
MAR.									
12...	73	--	.70	--	1.1	.60	--	1070	1.46
APR.									
30...	52	.3	--	.00	.15	.21	380	898	1.22
MAY									
26...	63	--	.04	.04	.40	.37	--	1040	.00
JULY									
07...	76	--	.23	.23	.39	.35	--	1170	1.59
AUG.									
19...	81	.5	--	.08	.28	.35	500	1040	1.41
SEP.									
29...	72	--	.03	.03	.39	.17	--	1190	1.62

JAMES RIVER BASIN

73

06478500 JAMES RIVER NEAR SCOTLAND, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	PERCENT SODIUM (00932)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	810- CHEM- ICAL OXYGEN DEMAND (MG/L) (00310)	TEMPER- ATURE (DEG C) (00010)
OCT. 13...	43.7	690	--	2.5	32	1680	8.1	3.2	8.5
NOV. 03...	93.2	750	--	--	--	1770	--	3.4	4.5
DEC. 23...	122	1900	--	--	--	2100	--	2.5	1.0
JAN. 21...	91.9	1200	840	2.9	29	2600	8.0	4.3	0.0
FEB. 26...	130	360	--	--	--	941	--	6.8	0.5
MAR. 12...	274	520	--	--	--	1430	--	3.3	0.5
APR. 30...	432	570	350	1.3	21	1380	7.4	--	11.0
MAY 26...	329	--	--	--	--	1490	7.2	7.1	16.5
JULY 07...	284	--	--	--	--	1610	7.6	--	26.5
AUG. 19...	183	530	240	3.2	40	1610	7.9	--	29.8
SEP. 29...	202	--	--	--	--	1580	7.9	--	16.0

FIELD DETERMINATIONS

DATE	TIME	DIS- CHARGE (CFS) (00060)	TEMPER- ATURE (DEG C) (00010)	AIR TEMP- ERATURE (DEG C) (00020)	PH (UNITS) (00400)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	DIS- SOLVED OXYGEN (MG/L) (00300)	IMME- DIATE COLI- FORM PER 100 ML (31501)	FECAL COLI- FORM PER 100 ML (31616)
OCT. 13...	1115	12	8.5	11.5	8.9	--	10.3	--	47
NOV. 03...	1310	23	4.5	2.0	8.2	1700	11.8	--	15
DEC. 23...	1330	24	1.0	-6.0	8.2	2300	8.3	--	--
JAN. 21...	1330	15	0.0	3.0	8.3	2880	8.8	--	0
FEB. 26...	1500	70	0.5	2.0	7.4	--	8.1	--	0
MAR. 12...	1630	95	0.5	14.0	7.6	--	8.5	--	55
APR. 30...	1300	178	11.0	20.0	8.7	--	12.4	--	23
MAY 26...	1400	117	16.5	20.0	7.0	--	9.6	--	930
JULY 07...	1300	90	26.5	27.5	9.7	1530	.0	--	130
AUG. 19...	1400	65	29.8	28.3	8.5	1500	14.6	--	840
SEP. 29...	1255	63	16.0	23.0	8.5	--	9.4	--	400

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS-SOLVED LEAD (PB) (UG/L) (01049)	DIS-SOLVED MERCURY (HG) (UG/L) (71890)	TOTAL MERCURY (HG) (UG/L) (71900)	DIS-SOLVED MOLYB- DENUM (MO) (UG/L) (51560)	DIS-SOLVED NICKEL (NI) (UG/L) (01065)	DIS-SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS-SOLVED SILVER (AG) (UG/L) (01075)	DIS-SOLVED VANA- DIUM (V) (UG/L) (01085)	DIS-SOLVED ZINC (ZC) (UG/L) (01090)
OCT. 13...	0	--	.0	2	5	0	0	1.7	10
JAN. 21...	0	.0	--	11	0	8	0	1.3	20
APR. 30...	0	--	--	2	15	40	0	2.5	30
AUG. 19...	1	--	.2	--	5	0	0	4.0	20

		TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00063)	ALDRIN (UG/L) (39330)	LINDANE (UG/L) (39341)	CHLOR- DANE (UG/L) (39350)	DDD (UG/L) (39360)	DDE (UG/L) (39365)	DDT (UG/L) (39370)	DI- ELDRIN (UG/L) (39380)
OCT.										
13...	1115	8.5	12	.00	.00	.0	.00	.00	.00	.00
JAN.										
21...	1330	0.0	15	.00	.00	.0	.00	.00	.00	.00
APR.										
30...	130^	11.0	178	.00	.00	.0	.00	.00	.00	.00

VERMILLION RIVER BASIN

75

06479000 VERMILLION RIVER NEAR WAKONDA, S. DAK.

LOCATION.--Lat 42°59'27", long 96°57'49", in SW¼NW¼ sec.2, T.94 N., R.52 W., Clay County, at gaging station, on left bank 40 ft downstream from bridge on State Highway 19, 4.3 miles downstream from Frog Creek, 7.3 miles southeast of Wakonda, and 31.4 miles upstream from mouth.

DRAINAGE AREA.--1,680 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical data published for water years 1961, 1966, 1967.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00006C)	DIS- SOLVED SILICA (SiO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (Mn) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 12...	1700	16	15	0	420	140	59	41	8.2	251
APR. 08...	1050	139	17	70	20	94	40	25	12	209
JUNE 17...	1330	151	23	--	--	140	56	36	12	257

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00956)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT. 12...	450	12	.2	.50	--	.080	--	170	4	918
APR. 08...	290	7.8	.2	--	.90	--	.35	90	20	610
JUNE 17...	430	11	.4	--	.64	--	.60	160	--	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHQS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 12...	848	1.25	39.7	580	380	.7	1150	8.1	10.5
APR. 08...	594	.83	229	400	230	.5	892	7.7	11.0
JUNE 17...	838	1.14	342	580	370	.7	1160	7.6	27.5

BIG SIOUX RIVER BASIN

06479500 BIG SIOUX RIVER AT WATERTOWN, S. DAK.

LOCATION.--Lat 44°56'33", long 97°08'45", in SW¼SW¼NW¼ sec.13, T.117 N., R.53 W., Codington County, at gaging station, on right bank 20 ft downstream from highway bridge, 1.7 miles downstream from inlet-outlet to Lake Kampeska, 3.5 miles northwest of Watertown, and 7.1 miles upstream from Willow Creek.

DRAINAGE AREA.--1,800 sq mi, approximately, of which about 1,400 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SIO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MANGANESE (MANG) (UG/L) (01556)	DIS- SOLVED CALCIUM (CA) (MG/L) (00915)	DIS- SOLVED MAGNESIUM (MAG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED POTASSIUM (K) (MG/L) (00935)	DIS- SOLVED BICARBONATE (BICAR- BONATE) (MG/L) (00440)
OCT. 14...	0815	1.5	25	480	310	79	33	25	6.2	330
JUNE 15...	1300	3.0	24	--	--	67	37	16	2.7	315

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00380)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (00300)
OCT. 14...	110	6.4	.2	.00	--	.11	--	100	9	463
JUNE 15...	90	4.1	.3	--	.11	--	.30	130	--	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 14...	450	.63	1.88	330	62	.6	708	7.9	3.5
JUNE 15...	397	.54	3.22	320	61	.4	630	8.0	27.0

BIG SIOUX RIVER BASIN

06479515 WILLOW CREEK NEAR WATERTOWN, S. DAK.

LOCATION.--Lat 44°54'17", long 97°03'31", in NE¼NW¼ sec.34, T.117 N., R.52 W., Codington County, at gaging station, on right bank 5 ft downstream from highway bridge, 4.7 miles upstream from mouth, and 2.8 miles east of Watertown.

DRAINAGE AREA.--125 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical data published for water year 1970.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SIO2) (MG/L) (00955)	DIS- SOLVED CALCIUM (CA) (MG/L) (00915)	DIS- SOLVED MANGANESE (MANG) (UG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED POTASSIUM (K) (MG/L) (00935)	BICARBONATE (BICAR- BONATE) (MG/L) (00440)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLORIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUORIDE (F) (MG/L) (00950)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)
JUNE 15...	1355	2.8	18	86	44	12	5.9	241	200	5.5	.2	.01

DATE	TIME	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (MG/L) (01020)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (00301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (MG/L) (00303)	DIS- SOLVED SOLIDS (TONS PER DAY) (MG/L) (00302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (CA, MG) (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (MG/L) (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (MG/L) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
JUNE 15...	1355	.080	130	490	.67	3.70	400	200	.3	740	8.1	28.5

06479529 STRAY HORSE CREEK NEAR CASTLEWOOD, S. DAK.

LOCATION.--Lat 44°43'52", long 96°57'23", in NE¼NE¼NW¼ sec.33, T.115 N., R.51 W., Hamlin County, at gaging station, on right bank at downstream side of bridge on State Highway 22, 3.5 miles east of Castlewood, 6.4 miles upstream from mouth, and 7.0 miles north of Dempster.

DRAINAGE AREA.--73.7 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).
Sediment records: October 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical and sediment data published for water year 1970.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SiO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 14...	0945	.20	5.8	110	170	120	62	35	6.8	195
JUNE 15...	1515	1.7	13	--	--	67	48	16	6.9	256

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (MG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS- SOLVED SOLIDS (RESI- DUE AT 190 C) (MG/L) (73300)
OCT. 14...	450	8.6	.2	1.0	--	.020	--	280	10	843
JUNE 15...	280	8.1	.2	--	.01	--	.10	150	--	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 14...	782	1.15	.46	550	390	.7	1090	7.6	5.5
JUNE 15...	585	.80	2.69	410	200	.3	898	7.8	31.0

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMP- ERATURE (DEG C)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SUS- PEN- DED SEDIM- ENT CHARGE (MG/L)	SUS- PEN- DED SEDIM- ENT DIS- CHARGE (T/DAY)
MAR. 16...	1045	1.0	24	24	1.6
MAY 04...	1230	15.0	4.9	56	.74
26...	1115	13.0	1.5	58	.23
JULY 07...	1245	27.0	2.8	59	.45
AUG. 02...	1500	25.0	.06	141	.03
31...	1300	21.0	.19	105	.05

BIG SIOUX RIVER BASIN

06479640 HIDEWOOD CREEK NEAR ESTELLINE, S. DAK.

LOCATION.--Lat 44°36'42", long 96°54'17", in SW¼NW¼ sec.12, T.113 N., R.51 W., Hamlin County, at gaging station, on left bank at upstream side of highway bridge, 2.7 miles north of Estelline, 2.8 miles southeast of Dempster, and 4.7 miles upstream from mouth.

DRAINAGE AREA.--164 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).
Sediment records: October 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical and sediment data published for water year 1970.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MANGANESE (MN) (UG/L) (01056)	DIS- SOLVED CALCIUM (CA) (MG/L) (00915)	DIS- SOLVED MAGNESIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED POTASSIUM (K) (MG/L) (00935)	BICARBONATE (HCO3) (MG/L) (00440)
OCT. 14...	1019	1.2	13	20	170	120	49	37	4.9	269
JUNE 15...	1600	5.9	13	--	--	100	43	21	6.6	293

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00943)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (009618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (07300)
OCT. 14...	340	6.2	.2	.00	--	.010	--	78	6	743
JUNE 15...	200	12	.2	--	.00	--	.20	150	--	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (00301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (00303)	DIS- SOLVED SOLIDS (TONS PER DAY) (00302)	HARD- NESS (CA, MG) (MG/L) (00970)	NON- CARBONATE HARD- NESS (MG/L) (00902)	SODIUM ADSORPTION RATIO (00931)	SPECIFIC CONDUCTANCE (MICRO-MHOS) (00995)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)
OCT. 14...	699	1.01	2.41	490	270	.7	994	7.7	5.0
JUNE 15...	540	.73	8.60	430	190	.4	822	8.0	30.5

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMPERATURE (DEG C)	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
MAR. 29...	1345	0.2	37	50	5.0
MAY 14...	1400	17.0	22	66	3.9
MAY 26...	1345	14.0	10	71	1.9
JULY 16...	1615	25.0	40	90	11
AUG. 12...	1300	19.0	7.7	224	4.7
AUG. 31...	1145	19.0	1.0	100	.27

BIG SIOUX RIVER BASIN

79

06479910 SIXMILE CREEK NEAR BROOKINGS, S. DAK.

LOCATION.--Lat 44°20'46", long 96°44'51", in NE&SE sec.7, T.110 N., R.49 W., Brookings County, at gaging station, on left bank 8 ft downstream from bridge, 0.7 mile upstream from Interstate Highway 29 and 2.7 miles northeast of Brookings.

DRAINAGE AREA.--54.0 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).
Sediment records: October 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical and sediment data published for 1970 water year.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 14...	1115	1.3	20	48	100	128	51	26	5.4	305
JUNE 16...	0820	2.8	22	--	--	93	44	22	4.5	319

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT. 14...	318	8.0	.2	.48	--	.010	--	151	754
JUNE 16...	180	12	.4	--	.03	--	.12	140	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 14...	709	1.03	2.65	527	277	.5	986	8.1	5.0
JUNE 16...	535	.73	4.04	410	150	.5	852	7.7	23.5

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMP- ERATURE (DEG C)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SUS- PEN- DED SED- IMENT DIS- CHARGE (MG/L)	SUS- PEN- DED SED- IMENT DIS- CHARGE (T/DAY)
MAR. 31...	0800	0.0	10	51	1.4
MAY 14...	1630	15.0	6.7	158	2.9
26...	1715	20.0	1.7	77	.35
JULY 06...	1330	25.5	1.9	111	.57
AUG. 04...	0900	16.0	.02	139	.00
31...	1230	19.0	.63	60	.10

BIG SIOUX RIVER BASIN

06480000 BIG SIOUX RIVER NEAR BROOKINGS, S. DAK.

LOCATION.--Lat 44°10'48", long 96°44'55", in NW¼NW¼ sec.8, T.108 N., R.49 W., Moody County, at gaging station, on right bank 3 ft downstream from highway bridge, 2.2 miles downstream from Medary Creek, and 9.5 miles southeast of Brookings.

DRAINAGE AREA.--4,420 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SiO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (MG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (MG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 14...	1210	50	10	110	150	74	39	37	8.1	260
JAN. 20...	1100	10	5.6	10	1900	66	53	32	7.6	250
JUNE 16...	0940	84	20	--	--	87	49	34	8.8	305

DATE	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS-SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS-SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS-SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (00300)
OCT. 14...	180	27	.3	.80	--	.030	--	110	8	541
JAN. 20...	230	17	.3	1.4	--	.010	.040	120	3	561
JUNE 16...	200	22	.4	--	.08	--	.50	160	--	--

DATE	TIME	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (00301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (00303)	DIS- SOLVED SOLIDS (TONS PER DAY) (00302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00395)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00310)
OCT. 14...		511	.74	73.0	350	130	.9	801	7.6	6.5
JAN. 20...		544	.76	15.1	380	180	.7	877	8.1	0.0
JUNE 16...		572	.78	130	420	170	.7	897	7.6	25.0

FIELD DETERMINATIONS

DATE	TIME	DIS- CHARGE (CFS) (00060)	TEMPER- ATURE (DEG C) (00010)	AIR TEMP- ERATURE (DEG C) (00020)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	FECAL COLI- FORM (COL. PER 100 ML) (31616)
OCT. 14...	1210	50	6.5	4.0	780	900

BIG SIOUX RIVER BASIN

81

06480000 BIG SIOUX RIVER NEAR BROOKINGS, S. DAK.--Continued

PERIOD OF RECORD.--Chemical analyses: July 1967 to September 1969, October 1969 to September 1971 (partial-record station).

Sediment records: October 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical data published for water years 1960-62, 1966-67, and for suspended-sediment data for water years 1967, 1970.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	DIS- SOLVED ALUM- INUM (AL) (UG/L) (01106)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED BARIUM (BA) (UG/L) (01025)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)
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OCT.	14...	1210	6.5	50	0	0	0	3	0	0
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DATE	TIME	DIS- SOLVED COPPER (CU) (UG/L) (01040)	DIS- SOLVED LEAD (PB) (UG/L) (01049)	DIS- SOLVED LITHIUM (LI) (UG/L) (01130)	DIS- SOLVED MERCURY (HG) (UG/L) (01190)	DIS- SOLVED NICKEL (NI) (UG/L) (01065)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS- SOLVED SILVER (AG) (UG/L) (01075)	DIS- SOLVED STRON- TIUM (SR) (UG/L) (01080)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
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OCT.	14...	0	0	20	0	5	0	0	380	10
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SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMP- ERATURE (DEG C)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SUS- PENDE SEDI- MENT (MG/L)	SUS- PENDE SEDI- MENT DIS- CHARGE (T/DAY)
MAR.	17...	1030	2.0	1270	68
MAY	05...	0915	15.0	191	312
	27...	0915	13.0	96	59
JULY	06...	1200	25.0	143	180
AUG.	04...	1030	19.0	27	312
SEP.	01...	0950	20.5	30	146

BIG SIOUX RIVER BASIN

06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, S. DAK.

LOCATION.--Lat 43°47'25", long 96°44'42", in NW¼NW¼ sec.29, T.104 N., R.49 W., Minnehaha County, at gaging station, on left bank at downstream side of highway bridge, 0.2 mile downstream from confluence of divided channels, and 3.0 miles southwest of Dell Rapids.

DRAINAGE AREA.--5,060 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

PERIOD OF RECORD.--Chemical analyses: October 1967 to September 1971.

Water temperatures: October 1967 to September 1971.

Sediment records: October 1967 to September 1971.

EXTREMES.--1970-71:

Dissolved solids: Maximum, 747 mg/l Dec. 1-31; minimum, 262 mg/l Mar. 1-31.

Hardness: Maximum, 490 mg/l Dec. 1-31; minimum, 150 mg/l Mar. 1-31.

Water temperatures: Maximum, 31.0°C June 26; minimum, freezing point on many days during November to March.

Sediment concentrations: Maximum daily, 298 mg/l July 11; minimum daily, 7 mg/l Dec. 28.

Sediment discharge: Maximum daily, 367 tons Mar. 20; minimum daily, 0.36 tons Jan. 25.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	MEAN DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SiO ₂) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (NA) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PC- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO ₃) (MG/L) (00440)
OCT.									
01-31	53	--	--	--	74	42	40	8.6	244
NOV.									
01-30	83	--	--	--	79	43	40	8.0	247
DEC.									
01-31	52	--	--	--	100	55	47	8.4	315
JAN.									
01-31	15	--	--	--	86	38	35	6.6	248
FEB.									
01-28	68	--	--	--	70	27	110	9.4	150
MAR.									
01-31	682	--	--	--	41	12	7.5	9.0	142
APR.									
01-30	243	--	--	--	73	34	21	8.3	226
MAY									
01-31	169	--	--	--	97	50	33	9.0	303
JUNE									
01-30	115	--	--	--	86	45	38	8.8	301
JULY									
01-31	138	--	--	--	73	33	24	7.8	253
AUG.									
01-31	20	13	--	--	81	45	37	7.9	263
SEP.									
01-30	24	14	--	--	81	43	37	7.7	237
WTD. AVG.	--	--	--	--	64	29	24	8.7	209
TIME WTD.									
AVG.	140	--	--	--	78	39	39	8.3	245
TOT. LOAD (TONS)	--	--	--	--	8850	3920	3330	1190	28700

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
14...	68	7.2	50	15	81	40	38	12	261
DEC.									
22...	45	20	50	200	120	57	46	8.3	373
FEB.									
25...	150	8.5	90	320	30	11	7.1	14	95
MAY									
25...	112	6.5	--	--	75	51	35	8.4	312

06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, S. DAK.--Continued

EXTREMES.--Continued

Period of record:

Dissolved solids (1967-68, 1970-71): Maximum, 848 mg/l Feb. 1-29, 1968; minimum, 262 mg/l Mar. 1-31, 1971.

Hardness (1967-68, 1970-71): Maximum, 549 mg/l Feb. 1-29, 1968; minimum, 150 mg/l Mar. 1-31, 1971.

Specific conductance (1967-70): Maximum daily, 1,260 micromhos Dec. 2, 1969; minimum daily, 138 micromhos Apr. 9, 1969.

Water temperatures: Maximum, 31.0°C June 26, 1971; minimum, freezing point on many days during winter period.

Sediment concentrations (1968-71): Maximum daily, 432 mg/l Apr. 9, 1969; minimum daily, 2 mg/l Feb. 5, 1970.

Sediment discharge: Maximum daily, 40,600 tons Apr. 9, 1969; minimum daily, 0.12 tons Mar. 5, 1969, Feb. 5, 1970.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Hardness, 540 mg/l Dec. 22; specific conductance, 1,400 micromhos Jan. 23. Minimum observed during water year: Dissolved solids, 212 mg/l Feb. 25; hardness, 120 mg/l Feb. 25; specific conductance, 240 micromhos Mar. 18. Flow affected by ice Dec. 20 to Mar. 25. Miscellaneous samples of chemical data published for water years 1960-62, 1967. Additional samples were collected for more comprehensive definition of water quality.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS-SOLVED SULFATE (SO4) (MG/L) (00945)	DIS-SOLVED CHLORIDE (CL) (MG/L) (00940)	DIS-SOLVED FLUORIDE (F) (MG/L) (00950)	DIS-SOLVED NITRATE (N) (MG/L) (00618)	DIS-SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS-SOLVED ORTHO-PHOSPHORUS (P) (MG/L) (00671)	TOTAL PHOSPHORUS (P) (MG/L) (00665)	DIS-SOLVED BORON (B) (UG/L) (01020)	DIS-SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L) (70300)
OCT.									
01-31	210	29	.1	1.6	--	--	--	130	566
NOV.									
01-30	220	30	.1	1.7	--	--	--	110	587
DEC.									
01-31	280	33	.3	2.9	--	--	--	130	747
JAN.									
01-31	190	24	.1	3.5	--	--	--	100	570
FEB.									
01-28	130	190	--	--	3.5	--	.50	100	718
MAR.									
01-31	42	7.5	--	--	2.6	--	.55	780	262
APR.									
01-30	170	15	--	--	1.3	--	.30	80	478
MAY									
01-31	250	22	--	--	.64	--	.35	130	654
JUNE									
01-30	190	24	--	--	.95	--	.50	260	584
JULY									
01-31	150	16	--	--	.96	--	.66	140	460
AUG.									
01-31	220	26	.5	--	1.2	.26	.31	180	--
SEP.									
01-30	220	28	1.4	--	1.3	.21	.31	160	--
WTD. AVG.	132	22	--	--	--	--	--	401	A437
TIME WTD.									
AVG.	190	36	--	--	--	--	--	193	A561
TOT. LOAD (TONS)	18100	3020	--	--	--	--	--	55	A58500

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
14...	190	29	.3	.80	--	--	--	150	544
DEC.									
22...	270	31	.1	2.7	--	--	--	130	739
FEB.									
25...	50	7.6	.2	4.4	--	--	.64	60	212
MAY									
25...	210	21	.3	--	.04	.060	.30	110	--

A Based on 304 days of chemical analysis.

BIG SIOUX RIVER BASIN

06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHCS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT.									
01-31	--	.77	81.0	360	160	.9	814	7.7	--
NOV.									
01-30	--	.80	132	370	170	.9	834	7.9	--
DEC.									
01-31	--	1.02	105	490	230	.9	1010	8.1	--
JAN.									
01-31	--	.78	23.1	370	170	.8	800	7.9	--
FEB.									
01-28	--	.98	132	290	160	2.8	1120	7.5	--
MAR.									
01-31	--	.36	482	150	35	.3	356	7.8	--
APR.									
01-30	--	.65	314	320	140	.5	713	7.6	--
MAY									
01-31	--	.89	298	450	200	.7	974	8.1	--
JUNE									
01-30	--	.79	181	400	150	.8	882	7.5	--
JULY									
01-31	--	.64	171	320	110	.6	711	7.3	--
AUG.									
01-31	566	.77	30.6	390	170	.8	867	8.2	--
SEP.									
01-30	555	.75	36.0	380	190	.8	855	8.2	--
WTD. AVG.	--	.60	319	278	108	.6	641	7.8	--
TIME WTD.									
AVG.	--	.76	166	358	157	.9	826	7.8	--
TOT. LOAD									
(TONS)	--	--	44100	--	--	--	--	--	--

ANALYSES OF ADDITIONAL SAMPLES

OCT.									
14...	532	.74	99.9	370	150	.9	821	7.7	7.5
DEC.									
22...	748	1.01	89.8	540	230	.9	1070	8.0	1.0
FEB.									
25...	196	.29	85.9	120	44	.3	339	7.9	2.0
MAY									
25...	561	.76	170	400	140	.8	905	7.7	11.5

BIG SIOUX RIVER BASIN

85

06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	840	835	950	---	---	---	435	920	865	860	850	935
2	845	835	970	---	---	---	515	920	860	835	840	924
3	850	850	1010	---	---	250	530	970	865	540	831	952
4	855	840	1010	---	---	250	555	990	855	465	834	900
5	865	830	1010	---	---	385	585	980	840	630	842	---
6	875	835	960	---	---	285	610	985	855	650	856	813
7	---	830	1100	1150	---	265	655	980	845	530	861	786
8	810	---	1070	1170	---	315	645	1000	850	560	856	808
9	830	810	1120	1200	---	325	645	---	845	585	867	795
10	830	825	---	---	---	350	640	980	780	610	872	829
11	810	800	1120	---	---	365	---	975	775	620	878	846
12	800	800	980	---	---	360	645	980	745	670	876	852
13	830	795	1200	---	---	---	670	960	815	685	901	826
14	850	875	1000	---	---	---	680	955	885	730	890	836
15	845	875	1120	---	---	---	695	950	825	755	896	828
16	860	830	---	---	---	285	700	955	835	745	916	835
17	855	855	1050	---	---	300	720	955	855	760	932	837
18	840	890	1120	---	---	240	770	940	860	790	918	831
19	845	890	---	---	---	245	760	940	---	800	867	846
20	825	950	---	---	---	320	760	---	860	795	896	825
21	835	940	1140	---	---	---	765	---	875	800	904	851
22	815	1070	---	1320	---	340	775	925	885	790	---	818
23	815	1030	1020	1400	---	330	815	910	895	815	910	831
24	815	---	---	1360	---	305	820	895	885	815	918	836
25	825	---	---	1380	---	360	---	905	900	820	931	839
26	820	---	1150	---	---	335	880	910	890	830	921	---
27	830	---	---	---	---	385	905	890	900	835	932	824
28	825	---	1130	---	---	390	935	890	895	840	935	810
29	---	---	1060	---	---	380	935	900	870	850	935	822
30	850	---	1170	---	---	390	930	905	850	860	954	844
31	845	---	---	---	---	430	---	890	---	860	938	---
AVG	E836	---	---	---	---	B327	D713	C941	F854	733	F892	D842

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.5	4.5	1.0	0.0	0.0	0.0	---	15.5	16.5	26.5	21.0	26.5
2	15.0	4.5	1.0	0.0	0.0	0.0	3.5	16.5	21.0	26.5	23.5	27.0
3	14.5	4.0	2.0	0.0	0.0	0.0	4.5	18.0	22.0	25.5	26.5	29.0
4	16.5	4.5	1.0	0.0	0.0	0.0	5.5	21.0	24.0	23.5	26.5	23.5
5	18.0	5.5	1.0	0.0	0.0	0.0	6.5	20.0	26.0	26.5	25.5	---
6	18.0	6.5	2.0	0.0	0.0	0.0	9.0	20.0	24.0	28.0	25.5	23.5
7	---	5.5	3.5	0.0	0.0	0.0	15.5	22.0	24.0	27.0	26.0	25.5
8	14.5	---	3.5	0.0	0.0	0.0	16.5	21.0	22.0	28.0	21.0	22.0
9	5.5	5.5	0.0	0.0	0.0	0.5	15.5	18.0	21.0	26.0	28.0	22.0
10	5.5	6.5	0.0	0.0	0.0	0.5	16.5	18.0	22.0	24.5	26.5	24.5
11	5.5	3.5	0.0	0.0	0.0	0.5	---	18.0	24.5	24.5	27.0	24.5
12	9.5	2.0	0.0	0.0	0.0	0.5	15.5	18.0	26.5	25.5	29.0	22.0
13	8.0	2.0	0.0	0.0	0.0	---	14.5	21.0	26.5	25.5	29.0	24.5
14	8.0	1.0	0.0	0.0	0.0	---	15.5	23.5	27.0	24.5	28.0	21.0
15	9.0	2.0	0.0	0.0	0.0	---	16.5	22.0	28.0	26.5	28.0	20.0
16	10.0	2.0	---	0.0	0.0	1.5	16.5	23.5	28.0	29.0	29.0	18.5
17	10.0	4.5	0.5	0.0	0.0	1.5	17.0	21.5	29.5	28.0	29.0	16.5
18	11.0	3.5	0.0	0.0	0.0	1.0	18.5	18.0	29.5	23.5	26.5	18.0
19	10.0	4.0	0.0	0.0	0.0	1.0	20.0	16.0	---	25.5	28.0	14.5
20	10.0	4.5	0.0	0.0	0.0	1.0	22.0	---	25.5	28.0	28.0	18.5
21	12.0	5.0	0.0	0.0	0.0	---	16.5	---	26.5	29.0	29.0	15.5
22	12.0	0.0	0.0	0.0	0.0	0.5	18.0	20.5	28.0	28.5	---	13.5
23	13.0	0.0	0.0	0.0	0.0	0.5	19.0	18.5	29.0	29.0	30.0	18.5
24	13.5	---	0.0	0.0	0.0	0.5	20.0	15.5	29.0	28.0	29.0	18.0
25	11.0	---	0.0	0.0	0.0	0.5	---	14.5	27.0	24.5	28.0	15.5
26	9.5	---	0.0	0.0	0.0	0.5	19.0	16.5	31.0	24.5	28.0	---
27	10.0	---	0.0	0.0	0.0	1.5	10.5	18.5	26.5	26.5	24.5	18.0
28	6.5	---	0.0	0.0	0.0	2.0	11.0	21.0	24.5	25.5	25.5	19.0
29	---	---	0.0	0.0	---	4.5	14.5	21.5	25.5	25.5	26.5	18.0
30	4.5	---	0.5	0.0	---	5.5	16.0	20.0	25.5	24.5	21.0	21.0
31	4.5	---	---	0.0	---	8.0	---	21.5	---	25.5	22.0	---
AVG	E10.5	---	E0.5	0.0	0.0	B1.5	C14.5	E19.5	E25.5	26.0	F26.5	D20.5

B Based on 26 days of data.

C Based on 27 days of data.

D Based on 28 days of data.

E Based on 29 days of data.

F Based on 30 days of data.

BIG SIOUX RIVER BASIN

06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, S. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

OCTOBER				NOVEMBER			DECEMBER		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	39	164	17	51	28	3.9	75	14	2.8
2	33	107	9.5	51	33	4.5	71	18	3.5
3	32	79	6.8	54	44	6.4	68	21	3.9
4	36	85	8.3	51	50	6.9	65	40	7.0
5	37	92	9.2	51	44	6.1	64	69	12
6	38	108	11	55	58	8.6	62	60	10
7	32	90	7.8	63	44	7.5	66	54	9.6
8	49	84	11	64	42	7.3	65	28	4.9
9	49	58	7.7	71	40	7.7	61	25	4.1
10	56	54	8.2	75	40	8.1	64	24	4.1
11	59	51	8.1	76	48	9.8	68	24	4.4
12	65	74	13	92	39	9.7	56	28	4.2
13	69	66	12	112	32	9.7	62	35	5.9
14	68	109	20	116	29	9.1	61	13	2.1
15	66	93	17	105	26	7.4	55	34	5.0
16	69	46	8.6	90	29	7.0	54	24	3.5
17	69	58	11	86	42	9.8	50	15	2.0
18	67	56	10	90	44	11	51	16	2.2
19	63	59	10	103	24	6.7	51	14	1.9
20	61	57	9.4	112	26	7.9	49	12	1.6
21	55	57	8.5	114	23	7.1	47	12	1.5
22	52	58	8.1	110	30	8.9	45	28	3.4
23	51	72	9.9	105	39	11	43	22	2.6
24	49	61	8.1	99	36	9.6	41	16	1.8
25	54	54	7.9	98	33	8.7	40	12	1.3
26	56	56	8.5	85	30	6.9	38	8	.82
27	49	51	6.7	82	28	6.2	35	8	.76
28	51	32	4.4	80	26	5.6	32	7	.60
29	51	30	4.1	78	22	4.6	30	8	.65
30	54	27	3.9	75	18	3.6	28	8	.60
31	54	29	4.2	--	--	--	26	8	.56
TOTAL	1633	--	289.9	2494	--	227.3	1623	--	109.29

JANUARY				FEBRUARY			MARCH		
DAY	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	28	10	.76	7.5	39	.79	350	50	47
2	30	10	.81	8.0	63	1.4	250	48	32
3	29	14	1.1	10	61	1.6	240	48	31
4	26	14	.98	13	90	3.2	230	50	31
5	23	16	.99	12	88	2.9	170	47	22
6	20	15	.81	11	86	2.6	150	33	13
7	17	15	.69	8.0	84	1.8	125	46	16
8	18	13	.63	6.0	82	1.3	115	16	5.0
9	20	15	.81	5.0	80	1.1	105	22	6.2
10	19	15	.77	6.0	78	1.3	95	20	5.1
11	18	15	.73	6.0	76	1.2	140	34	13
12	17	15	.69	7.0	76	1.4	450	37	45
13	16	15	.65	7.5	78	1.6	1000	50	135
14	15	15	.61	10	79	2.1	1250	80	270
15	14	15	.57	15	66	2.7	1300	70	246
16	13	15	.53	25	69	4.7	1200	63	204
17	12	16	.52	45	56	6.8	1300	79	277
18	11	16	.48	150	70	28	1500	75	304
19	10	16	.43	55	68	10	1450	84	329
20	9.0	16	.39	30	66	5.3	1400	97	367
21	10	16	.43	35	62	5.9	1300	60	211
22	12	13	.42	30	60	4.9	1100	40	119
23	13	13	.46	25	60	4.1	900	30	73
24	12	25	.81	80	58	13	740	35	70
25	11	12	.36	150	56	23	650	46	81
26	10	16	.43	300	54	44	606	42	69
27	9.0	16	.39	450	50	61	598	48	78
28	8.0	20	.43	400	50	54	644	165	287
29	7.5	24	.49	--	--	--	637	79	136
30	7.0	28	.53	--	--	--	606	76	124
31	7.0	34	.64	--	--	--	546	66	97
TOTAL	471.5	--	19.34	1907.0	--	291.69	21147	--	3743.3

BIG SIOUX RIVER BASIN

87

06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, S. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DAY	APRIL			MAY			JUNE		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	456	70	86	253	128	87	100	96	26
2	412	73	81	260	98	69	100	92	25
3	378	81	83	264	114	81	100	82	22
4	319	58	50	262	98	69	105	61	17
5	277	37	28	250	123	83	107	58	17
6	271	41	30	239	142	92	109	51	15
7	270	46	34	221	99	59	120	62	20
8	252	75	51	211	131	75	123	98	33
9	243	65	43	203	90	49	172	94	44
10	243	100	66	195	76	40	168	83	38
11	232	106	66	184	108	54	188	79	40
12	225	111	67	182	119	58	188	66	34
13	217	122	71	176	93	44	178	76	37
14	208	91	51	178	58	28	146	90	35
15	203	102	56	164	73	32	144	98	38
16	197	94	50	162	53	23	134	89	32
17	196	111	59	157	61	26	123	97	32
18	199	82	44	132	65	23	116	116	36
19	193	90	47	123	71	24	118	116	37
20	197	106	56	125	63	21	100	116	31
21	208	81	45	127	55	19	94	100	25
22	198	77	41	130	47	16	85	103	24
23	201	79	43	144	46	18	83	82	18
24	209	86	49	132	40	14	85	84	19
25	211	90	51	118	38	12	79	87	19
26	208	98	55	111	39	12	79	88	19
27	213	61	35	109	62	18	77	90	19
28	207	46	26	111	35	10	71	93	18
29	215	44	26	111	50	15	79	99	21
30	238	90	58	107	56	16	85	114	26
31	--	--	--	105	60	17	--	--	--
TOTAL	7296	--	1548	5246	--	1204	3456	--	817

DAY	JULY			AUGUST			SEPTEMBER		
	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCENTRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
1	185	106	53	45	83	10	17	86	3.9
2	300	156	126	40	71	7.7	22	64	3.8
3	276	175	130	36	61	5.9	27	74	5.4
4	305	188	155	33	69	6.1	36	70	6.8
5	313	146	123	32	64	5.5	36	64	6.2
6	273	179	132	30	64	5.2	33	55	4.9
7	225	144	87	30	63	5.1	32	95	8.2
8	182	130	64	20	70	3.8	29	84	6.6
9	170	124	57	14	77	2.9	28	59	4.5
10	195	141	74	20	99	5.3	28	84	6.4
11	178	298	143	19	57	2.9	27	63	4.6
12	150	175	71	19	48	2.5	26	76	5.3
13	141	153	58	20	76	4.1	26	84	5.9
14	134	121	44	16	63	2.7	22	90	5.3
15	114	97	30	16	59	2.5	22	64	3.8
16	118	80	28	15	73	3.0	22	67	4.0
17	111	87	26	13	83	2.9	21	53	3.0
18	98	78	21	9.2	113	2.8	21	46	2.6
19	89	56	13	16	69	3.0	21	39	2.2
20	87	49	12	18	57	2.8	21	67	3.8
21	83	58	13	16	63	2.7	19	50	2.7
22	75	76	15	15	67	2.7	20	34	1.8
23	69	95	18	17	71	3.3	22	68	4.0
24	66	97	17	16	86	3.7	23	86	5.3
25	56	93	15	16	73	3.2	22	71	4.2
26	53	102	15	17	55	2.5	22	64	3.8
27	51	76	10	17	68	3.1	22	57	3.4
28	48	85	11	15	66	2.7	22	70	4.5
29	45	104	13	14	82	3.1	22	68	4.0
30	45	68	8.3	13	66	2.3	24	92	6.0
31	45	97	12	17	61	2.8	--	--	--
TOTAL	4280	--	1594.3	634.2	--	118.8	735	--	136.9

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

5,922.7

10099.82

BIG SIOUX RIVER BASIN

06481500 SKUNK CREEK NEAR SIOUX FALLS, S. DAK.

LOCATION.--Lat 43°32'38", long 96°48'27", in NW¼NW¼ sec.23, T.101 N., R.50 W., Minnehaha County, at gaging station, on left bank 5 ft downstream from bridge on U.S. Highway 16, 600 ft upstream from small right-bank tributary, 3.2 miles upstream from mouth, and 4 miles west of Sioux Falls.

DRAINAGE AREA.--520 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: July 1967 to September 1971 (partial-record station).
Sediment records: October 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical data published for water years 1962, 1967, and for suspended-sediment data for water year 1970.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00260)	DIS- SOLVED SILICA (SIO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MANGANESE (MN) (UG/L) (01056)	DIS- SOLVED CALCIUM (CA) (MG/L) (03915)	DIS- SOLVED MAGNESIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED POTASSIUM (K) (MG/L) (00935)	BICARBONATE (HCO3) (MG/L) (03440)
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OCT. 12...	1515	4.7	10	0	240	78	39	18	7.4	260
APR. 08...	1415	46	11	200	60	81	34	15	10	236
JUNE 16...	1405	23	25	--	--	95	47	25	12	318

DATE	TIME	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLORIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUORIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED PHOSPHORUS (P) (MG/L) (00666)	TOTAL PHOSPHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLATINUM-COBALT) (UNITS) (00280)	DIS- SOLVED SOLIDS (RESIDUE AT 180 C) (MG/L) (03300)
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OCT. 12...	180	12	.3	.90	--	.050	--	70	6	552
APR. 08...	170	7.7	.2	--	.39	--	.40	70	20	452
JUNE 16...	220	12	.4	--	.39	--	.50	120	--	--

DATE	TIME	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (00301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (MG/L) (00303)	DIS- SOLVED SOLIDS (TONS PER DAY) (MG/L) (00302)	HARD- NESS (CA, MG) (MG/L) (00900)	NON- CARBONATE HARD- NESS (MG/L) (00902)	SODIUM ADSORPTION RATIO (MG/L) (00931)	SPECIFIC CONDUCTANCE (MICRO-MHOS) (MG/L) (00095)	PH (UNITS) (00400)	TEMPERATURE (DEG C) (00010)
------	------	---	--	--	--	---	--	--	--------------------------	-----------------------------------

OCT. 12...	474	.75	7.00	350	140	.4	728	8.0	8.5
APR. 08...	447	.61	56.1	340	150	.4	716	7.5	12.5
JUNE 16...	595	.81	36.9	430	170	.5	916	7.4	29.0

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMPERATURE (DEG C)	INSTANTANEOUS DISCHARGE (CFS)	SUSPENDED SEDIMENT (MG/L)	SUSPENDED SEDIMENT DISCHARGE (T/DAY)
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APR. 01...	1430	5.0	90	104	25
MAY 06...	1300	15.0	22	150	8.9
MAY 28...	0930	17.0	11	116	3.4
JULY 08...	1015	23.5	4.3	81	.94
AUG. 05...	1515	24.0	1.1	184	.55
SEP. 02...	1300	23.0	.72	167	.32

BIG SIOUX RIVER BASIN

89

06482100 BIG SIOUX RIVER NEAR BRANDON, S. DAK.

LOCATION.--Lat 43°36'25", long 96°37'55", in NE¼SE¼ sec.30, T.102 N., R.48 W., Minnehaha County, at gaging station, on left bank 130 ft upstream from Great Northern Railway bridge, 2.8 miles northwest of Brandon, and 7.2 miles upstream from Split Rock Creek.

DRAINAGE AREA.--5,810 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

PERIOD OF RECORD.--July 1969 to September 1971.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00660)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)
OCT.									
12...	1300	80	76	39	--	--	--	200	67
NOV.									
03...	0915	80	81	39	--	--	--	210	120
DEC.									
22...	1200	55	120	52	--	--	--	290	160
JAN.									
20...	1200	30	110	46	--	--	--	300	343
FEB.									
25...	1400	250	50	19	--	--	--	81	30
MAR.									
12...	1330	240	52	17	--	--	--	84	36
APR.									
29...	1230	261	85	45	--	--	--	230	41
MAY									
25...	1430	145	88	50	--	--	--	230	71
JUNE									
16...	1125	177	88	40	40	9.2	267	200	57
JULY									
08...	0830	193	49	32	--	--	--	150	53
AUG.									
24...	1223	16	83	34	--	--	--	240	300
SEP.									
30...	1230	24	78	40	--	--	--	210	290

DATE	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED AMMONIA NITRO- GEN (N) (MG/L) (00608)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)
OCT.									
12...	--	.60	--	6.1	1.9	--	627	.85	135
NOV.									
03...	--	.30	--	11	2.8	--	721	.98	156
DEC.									
22...	--	.90	--	12	3.7	--	997	1.36	148
JAN.									
23...	--	.20	--	34	18	--	1290	1.75	104
FEB.									
25...	--	1.8	--	--	1.2	--	365	.50	246
MAR.									
12...	--	.90	--	2.8	.79	--	367	.50	244
APR.									
29...	--	.40	.40	1.5	.61	--	636	.86	448
MAY									
25...	--	3.5	3.5	3.2	1.5	--	710	.97	278
JUNE									
16...	.4	--	.66	--	.70	160	583	.79	279
JULY									
08...	--	2.0	2.1	1.1	.80	--	526	.72	274
AUG.									
24...	--	1.8	2.5	16	6.3	--	1030	1.40	44.5
SEP.									
30...	--	.50	.67	36	7.7	--	1220	1.66	79.1

BIG SIOUX RIVER BASIN

06482100 BIG SIOUX RIVER NEAR BRANDON, S. DAK.--Continued

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	HARD- NESS (CA, MG) (000900)	NON- CAR- BONATE HARD- NESS (MG/L) (000902)	SODIUM AD- SORP- TION RATIO (000931)	PERCENT SODIUM (000932)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (000995)	PH (UNITS) (000400)	BIO- CHEM- ICAL OXYGEN DEMAND (MG/L) (000310)	TEMPER- ATURE (DEG C) (000110)
OCT. 12...	350	--	--	--	947	8.0	--	10.0
NOV. 03...	360	--	--	--	1180	--	--	5.0
DEC. 22...	500	--	--	--	1490	--	--	1.0
JAN. 20...	460	--	--	--	2270	7.9	--	3.0
FEB. 25...	200	--	--	--	556	--	1.6	3.0
MAR. 12...	200	--	--	--	592	--	--	3.0
APR. 29...	--	--	--	--	985	7.6	--	10.5
MAY 25...	--	--	--	--	1100	7.4	--	11.5
JUNE 16...	380	170	.9	18	968	7.3	--	26.0
JULY 08...	--	--	--	--	816	7.7	--	22.5
AUG. 24...	--	--	--	--	1750	7.1	--	25.0
SEP. 30...	--	--	--	--	2110	7.0	--	22.0

DATE	TIME	TEMPER- ATURE (DEG C) (000010)	DIS- CHARGE (CFS) (000060)	DIS- SOLVED ARSENIC (AS) (UG/L) (010000)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	HEXA- VALENT CHRO- MIUM (CR6) (UG/L) (01032)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED LEAD (PB) (UG/L) (01049)	TOTAL MERCURY (HG) (UG/L) (71900)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
OCT. 12...	1300	10.0	80	0	4	0	0	0	1	.2	29

BIG SIOUX RIVER BASIN

91

06482610 SPLIT ROCK CREEK AT CORSON, S. DAK.

LOCATION.--Lat 43°36'59", long 96°33'54", in NE¼NW¼ sec.26, T.102 N. (corrected), R.48 W., Minnehaha County, at gaging station, on left bank 6 ft downstream from highway bridge, 0.3 mile east of Corson and 3.4 miles upstream from mouth.

DRAINAGE AREA.--475 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: October 1970 to September 1971 (partial-record station).
Sediment records: October 1970 to September 1971 (partial-record station).

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SIO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MANG- NESE (MN) (MG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 12...	1350	14	4.3	0	38	61	30	24	9.0	278
APR. 05...	1230	54	12	100	410	51	18	16	6.8	191
JUNE 16...	1325	17	7.5	--	--	71	28	31	5.9	270

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOLVED PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
OCT. 12...	86	15	.4	.60	--	.070	--	80	6	393
APR. 05...	52	16	.3	2.4	--	.20	--	40	14	292
JUNE 16...	77	38	.6	--	.01	--	.34	130	--	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTIT- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 12...	366	.53	14.9	270	47	.6	610	8.2	8.5
APR. 05...	277	.40	42.6	200	46	.5	476	7.9	7.0
JUNE 16...	392	.53	18.0	290	71	.8	631	7.8	28.5

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMP- ERATURE (DEG C)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SUS- PENDED SEDIM- ENT DIS- CHARGE (MG/L)	SUS- PENDED SEDIM- ENT DIS- CHARGE (T/DAY)
MAR. 17...	1330	1.0	308	64	53
APR. 05...	1230	--	54	124	18
MAY 05...	1500	15.0	31	89	7.4
27...	1500	22.0	17	64	2.9
JUNE 3...	1400	23.5	1060	535	1530
JULY 08...	1500	25.0	101	125	34
AUG. 05...	0945	19.0	9.9	168	4.5
SEP. 02...	0945	21.5	5.3	131	1.9

BIG SIOUX RIVER BASIN

06485500 BIG SIOUX RIVER AT AKRON, IOWA

LOCATION.--Lat 42°49'42", long 96°33'45", in NE¼SW¼ sec.31, T.93 N., R.48 W., Plymouth County, Iowa, at gaging station, on left bank at west edge of Akron, 0.6 mile downstream from bridge on State Highway 48, and 2.3 miles upstream from Union Creek.

DRAINAGE AREA.--9,030 sq mi, approximately, of which about 1,970 sq mi is probably noncontributing.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00937)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
OCT. 13...	0845	395	11	20	38	93	35	59	13	246
JAN. 27...	1530	90	23	130	3000	140	51	74	8.4	390
MAR. 30...	1200	2680	2.4	--	--	56	12	12	9.2	152
APR. 29...	1500	734	1.0	50	30	93	43	30	6.3	260
JUNE 17...	1045	1390	19	--	--	100	36	19	5.8	308

DATE	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (00300)
OCT. 13...	260	60	.3	5.5	--	.97	--	140	10	646
JAN. 20...	260	81	.5	8.9	--	1.3	1.5	140	4	906
MAR. 30...	71	14	.3	--	--	--	--	--	--	302
APR. 29...	190	31	.0	--	.50	--	.40	100	--	--
JUNE 17...	160	16	.5	--	3.3	--	.60	80	--	--

DATE	DIS- SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (00301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (00303)	DIS- SOLVED SOLIDS (TONS PER DAY) (00302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
OCT. 13...	618	.88	689	370	170	1.3	966	7.4	8.0
JAN. 20...	873	1.23	220	560	240	1.4	1250	7.7	0.0
MAR. 30...	--	.41	2190	188	63	.4	460	7.5	--
APR. 29...	526	.72	1040	410	200	.6	867	7.3	11.0
JUNE 17...	523	.71	1960	400	150	.4	823	7.8	25.0

BIG SIOUX RIVER BASIN

93

06485500 BIG SIOUX RIVER AT AKRON, IOWA--Continued

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1971 (partial-record station).
Sediment records: September 1970 to September 1971 (partial-record station).

REMARKS.--Miscellaneous samples for chemical data published for water years 1962, 1966-67, and for sediment data for water year 1967.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (000010)	DIS- CHARGE (CFS) (000060)	DIS- SOLVED ALUM- INUM (AL) (01106)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED BARIUM (BA) (UG/L) (01005)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED COPPER (CU) (UG/L) (01040)
OCT. 13...	0845	8.0	395	200	0	0	4	0	0	0
APR. 29...	1500	11.0	734	300	20	--	6	--	1	4

DATE	DIS- SOLVED LEAD (PB) (UG/L) (01049)	DIS- SOLVED LITHIUM (LI) (UG/L) (01130)	DIS- SOLVED MERCURY (HG) (UG/L) (01890)	DIS- SOLVED MOLYB- DENUM (MO) (UG/L) (01060)	DIS- SOLVED NICKEL (NI) (UG/L) (01065)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)	DIS- SOLVED SILVER (AG) (UG/L) (01075)	DIS- SOLVED STRON- TIUM (SR) (UG/L) (01080)	DIS- SOLVED VANA- DIUM (V) (UG/L) (01085)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
OCT. 13...	0	30	0	--	8	0	0	460	--	10
APR. 29...	0	29	--	7	10	0	0	420	1.3	--

FIELD DETERMINATIONS

DATE	TIME	DIS- CHARGE (CFS) (000060)	TEMPER- ATURE (DEG C) (000010)	AIR TEMP- ERATURE (DEG C) (00020)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	IMME- DIATE COLI- FORM (COL. PER 100 ML) (31501)	FECAL COLI- FORM (COL. PER 100 ML) (31616)
OCT. 13...	0845	395	8.0	8.0	940	--	--
APR. 19...	0935	310	12.0	12.0	--	--	700
APR. 29...	1500	734	11.0	--	--	160	--

SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS

DATE	TIME	TEMPER- ERATURE (DEG C)	INSTAN- TANEOUS DIS- CHARGE (CFS)	SUS- PENDED SEDI- MENT (MG/L)	SUS- PENDED SEDI- MENT DIS- CHARGE (T/DAY)
MAR. 23...	1130	--	2080	510	2860
APR. 07...	1245	11.0	1260	269	915
MAY 13...	1015	15.0	470	170	216
JUNE 10...	1445	21.0	6870	3080	57100
JULY 13...	1045	23.5	1650	486	2170
AUG. 10...	1030	24.0	216	118	69
SEPT. 23...	1045	10.0	110	78	23

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

CHEYENNE RIVER BASIN

RAPID C. BLW SEWAGE PLANT NR RAPID CITY, S. DAK. (Lat 44 01 23 LONG 103 05 33)

DATE	TIME	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	HEXA- VALENT CHRO- MIUM (CR6) (UG/L) (01032)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED LEAD (PB) (UG/L) (01049)	TOTAL MERCURY (HG) (UG/L) (01090)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
OCT. 69...	0850	0	0	0	0	0	0	.7	20

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SI02) (MG/L) (00955)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (MG/L) (00925)	DIS- SOLVED SODIUM (NA) (MG/L) (00930)	DIS- SOLVED PO- TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	TOTAL NITRATE (NO3) (MG/L) (01850)
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CEDAR CREEK BASIN

CEDAR CREEK NEAR KENNEBEC, S. DAK. (LAT 44 08 21 LONG 099 57 36)

APR., 1971	01...	1600	1.5	16	120	28	261	12	212	630	120	.7	3.2
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JOE CREEK BASIN

JOE CREEK NEAR DE GREY, S. DAK. (LAT 44 08 59 LONG 099 47 45)

APR., 1971	01...	1230	.70	27	170	45	149	8.4	416	530	50	.3	.0
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MEDICINE CREEK BASIN

MEDICINE CREEK NEAR LOWER BRULE, S. DAK. (LAT 44 03 57 LONG 099 44 11)

APR., 1971	01...	1500	--	12	110	27	87	9.5	132	440	28	.5	.4
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BRULE CREEK BASIN

BRULE CREEK NEAR LOWER BRULE, S. DAK. (LAT 44 03 34 LONG 099 34 05)

APR., 1971	01...	1430	.07	17	280	85	440	17	302	1400	300	1.0	1.0
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MISSOURI RIVER MAIN STEM

MISSOURI R AT L SHARPE SPILLWAY NEAR FT THOMPSON, S. DAK. (LAT 44 03 40 LONG 099 27 12)

APR., 1971	01...	1345	--	5.0	54	21	70	5.5	196	200	13	.6	.3
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CAMPBELL CREEK BASIN

CAMPBELL CREEK NEAR FORT THOMPSON, S. DAK. (LAT 44 01 54 LONG 099 22 01)

APR., 1971	01...	1100	.60	26	170	58	168	13	353	690	36	.4	.0
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CROW CREEK BASIN

CROW CREEK NEAR SHELBY, S. DAK. (LAT 43 59 29 LONG 099 13 07)

APR., 1971	01...	1000	21	18	46	19	55	17	172	180	13	.3	.7
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ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

95

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)
CEDAR CREEK BASIN											
CEDAR CREEK NEAR KENNEBEC, S. DAK. (LAT 44 08 21 LONG 099 57 36)											
APR., 1971 01...	.090	640	1380	1290	1.88	5.59	410	230	5.6	1830	8.0
JOE CREEK BASIN											
JOE CREEK NEAR DE GREY, S. DAK. (LAT 44 08 59 LONG 099 47 45)											
APR., 1971 01...	.010	210	1260	1180	1.71	2.38	600	260	2.6	1600	7.8
MEDICINE CREEK BASIN											
MEDICINE CREEK NEAR LOWER BRULE, S. DAK. (LAT 44 03 57 LONG 099 44 11)											
APR., 1971 01...	.090	110	825	779	1.12	--	380	270	1.9	1090	7.9
BRULE CREEK BASIN											
BRULE CREEK NEAR LOWER BRULE, S. DAK. (LAT 44 03 34 LONG 099 34 05)											
APR., 1971 01...	.070	780	2890	2680	3.93	.55	1100	810	5.9	3470	8.1
MISSOURI RIVER MAIN STEM											
MISSOURI R AT L SHARPE SPILLWAY NEAR FT THOMPSON, S. DAK. (LAT 44 03 40 LONG 099 27 12)											
APR., 1971 01...	.010	100	474	463	.64	--	220	60	2.	710	8.2
CAMPBELL CREEK BASIN											
CAMPBELL CREEK NEAR FORT THOMPSON, S. DAK. (LAT 44 01 54 LONG 099 22 01)											
APR., 1971 01...	.070	170	1440	1330	1.96	2.33	650	360	2.9	1740	8.0
CROW CREEK BASIN											
CROW CREEK NEAR SHELBY, S. DAK. (LAT 43 59 29 LONG 099 13 07)											
APR., 1971 01...	.38	150	476	433	.65	27.0	190	53	1.7	665	7.0

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- CHARGE (CFS) (00060)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	DIS- SOLVED LITHIUM (LI) (UG/L) (01130)	DIS- SOLVED MERCURY (HG) (UG/L) (71890)	DIS- SOLVED STRON- TIUM (SR) (UG/L) (01080)	DIS- SOLVED SELE- NIUM (SE) (UG/L) (01145)
CEDAR CREEK BASIN									
CEDAR CREEK NEAR KENNEBEC, S. DAK. (LAT 44 08 21 LONG 099 57 36)									
APR., 1971									
01...	1600	--	1.5	0	8	140	.1	1000	0
JOE CREEK BASIN									
JOE CREEK NEAR DE GREY, S. DAK. (LAT 44 08 59 LONG 099 47 45)									
APR., 1971									
01...	1230	--	.70	0	8	100	.2	600	0
MEDICINE CREEK BASIN									
MEDICINE CREEK NEAR LOWER BRULE, S. DAK. (LAT 44 03 57 LONG 099 44 11)									
APR., 1971									
01...	1500	--	--	0	12	90	.0	1100	0
BRULE CREEK BASIN									
BRULE CREEK NEAR LOWER BRULE, S. DAK. (LAT 44 03 34 LONG 099 34 05)									
APR., 1971									
01...	1430	--	.07	0	2	210	.0	5800	0
MISSOURI RIVER MAIN STEM									
MISSOURI R AT L SHARPE SPILLWAY NEAR FT THOMPSON, S. DAK. (LAT 44 03 40 LONG 099 27 12)									
APR., 1971									
01...	1345	--	--	0	1	50	.4	580	0
CAMPBELL CREEK BASIN									
CAMPBELL CREEK NEAR FORT THOMPSON, S. DAK. (LAT 44 01 54 LONG 099 22 01)									
APR., 1971									
01...	1100	--	.60	0	2	150	.0	1100	0
CROW CREEK BASIN									
CROW CREEK NEAR SHELBY, S. DAK. (LAT 43 59 29 LONG 099 13 07)									
APR., 1971									
01...	1000	--	21	0	3	50	.4	640	0
WHITE RIVER BASIN									
06445700 - WHITE RIVER AT SLIM BUTTE, S. DAK. (LAT 43 04 33 LONG 102 48 41)									
NOV., 1970									
16...	1030	6.0	--	--	--	--	--	--	12
				SPECI- FIC COND- UCTANCE (MICRO- MHOS) (00095)	NITRATE (NO3) (MG/L) (71850)	NITRATE (N) (MG/L) (00620)	TEMP- ERATURE (DEG C) (00010)	SELE- NIUM (SE) (UG/L) (01145)	
NOV.									
16...	1030			1050	1.5	.030	6.0	12	

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

97

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971

DATE	TIME	TEMPER- ATURE (DEG C) (00010)	DIS- SOLVED ARSENIC (AS) (UG/L) (01000)	DIS- SOLVED CAD- MIUM (CD) (UG/L) (01025)	HEXA- VALENT CHRO- MIUM (CR6) (UG/L) (01032)	TOTAL CHRO- MIUM (CR) (UG/L) (01034)	DIS- SOLVED COBALT (CO) (UG/L) (01035)	DIS- SOLVED LEAD (PB) (UG/L) (01049)	TOTAL MERCURY (HG) (UG/L) (71900)	DIS- SOLVED ZINC (ZN) (UG/L) (01090)
------	------	--	--	---	--	---	---	---	---	---

JAMES RIVER BASIN

06476050 - JAMES RIVER AT 21ST BRIDGE AT HURON, S. DAK. (LAT 44 20 29 LONG 098 11 28)

OCT. 13...	1415	9.5	6	14	0	0	0	7	.2	26
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MITCHELL LAKE AT MITCHELL, S. DAK. (LAT 43 44 17 LONG 098 01 22)

OCT. 12...	1100	10.0	0	3	0	0	0	2	.3	10
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BIG SIOUX RIVER BASIN

BIG SIOUX RIVER BELOW WATERTOWN, S. DAK. (LAT 44 52 49 LONG 097 06 30)

OCT. 14...	0915	4.0	0	3	0	0	0	0	.0	28
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06482830 - BEAVER CREEK NEAR CANTON, S. DAK. (LAT 43 19 04 LONG 096 36 31)

DATE	TIME	DIS- CHARGE (CFS) (00060)	DIS- SOLVED SILICA (SIO2) (MG/L) (00955)	DIS- SOLVED IRON (FE) (UG/L) (01046)	DIS- SOLVED MAN- GANESE (MN) (UG/L) (01056)	DIS- SOLVED CAL- CIUM (CA) (MG/L) (00915)	DIS- SOLVED MAG- NE- SIUM (MG) (00925)	DIS- SOLVED SIUM (NA) (MG/L) (00930)	DIS- SOLVED TAS- SIUM (K) (MG/L) (00935)	BICAR- BONATE (HCO3) (MG/L) (00440)
------	------	------------------------------------	---	---	---	---	--	---	--	---

OCT. 12...	1600	2.1	20	24	800	335	137	76	16	302
APR. 08...	1300	5.1	17	100	1800	270	100	54	13	330
JUNE 17...	0915	12	28	--	--	160	59	33	12	297

DATE	TIME	DIS- SOLVED SULFATE (SO4) (MG/L) (00945)	DIS- SOLVED CHLO- RIDE (CL) (MG/L) (00940)	DIS- SOLVED FLUO- RIDE (F) (MG/L) (00950)	DIS- SOLVED NITRATE (N) (MG/L) (00618)	DIS- SOLVED NITRITE PLUS NITRATE (N) (MG/L) (00631)	DIS- SOL- VED- PHOS- PHORUS (P) (MG/L) (00666)	TOTAL PHOS- PHORUS (P) (MG/L) (00665)	DIS- SOLVED BORON (B) (UG/L) (01020)	COLOR (PLAT- INUM- COBALT UNITS) (00080)	DIS- SOLVED SOLIDS (RESI- DUE AT 180 C) (MG/L) (70300)
------	------	---	--	---	---	--	---	--	---	---	---

OCT. 12...	1220	4.7	.2	.71	--	.080	--	295	6	2170
APR. 08...	870	5.2	.2	.90	--	.030	--	170	3	1590
JUNE 17...	460	4.4	.3	--	.77	--	.20	140	--	--

DATE	TIME	DIS- SOLVED SOLIDS (SUM OF CONSTI- TUENTS) (MG/L) (70301)	DIS- SOLVED SOLIDS (TONS PER AC-FT) (70303)	DIS- SOLVED SOLIDS (TONS PER DAY) (70302)	HARD- NESS (CA,MG) (MG/L) (00900)	NON- CAR- BONATE HARD- NESS (MG/L) (00902)	SODIUM AD- SORP- TION RATIO (00931)	SPE- CIFIC CON- DUCT- ANCE (MICRO- MHOS) (00095)	PH (UNITS) (00400)	TEMPER- ATURE (DEG C) (00010)
------	------	--	---	---	---	--	--	---	--------------------------	--

OCT. 12...	1960	2.95	12.3	1400	1150	.9	2190	8.0	11.0
APR. 08...	1490	2.16	21.9	1100	810	.7	1790	8.0	13.5
JUNE 17...	906	1.23	29.4	640	400	.6	1230	7.7	23.5

INDEX

	Page		Page
Acre-foot (AC-FT, ac-ft), definition of.....	2	Edgemont, Cheyenne River at.....	17-19
Akron, Iowa, Big Sioux River at.....	92-93	Elm Springs, Belle Fourche River near.....	56-58
Angostura Dam, Cheyenne River below.....	20-23	Estelline, Hidewood Creek near.....	78
Beaver Creek (tributary to Big Sioux River)		Farmingdale, Rapid Creek near.....	36-39
near Canton.....	97	Fort Thompson, Missouri River at Lake	
Beaver Creek (tributary to Cheyenne River)		Sharpe Spillway near.....	94-96
near Newcastle, Wyo.....	16	Campbell Creek near.....	94-96
Bed material, definition of.....	2	Gaging station, definition of.....	3
Belle Fourche, Inlet Canal near.....	44-47	Hardness, definition of.....	3
Belle Fourche River, at Wyoming-South Dakota		Hidewood Creek near Estelline.....	78
State line.....	40-43	Hill City, Castle Creek above Deerfield	
near Elm Springs.....	56-58	Reservoir, near.....	28-31
near Sturgis.....	52-55	Horse Creek near Vale.....	48-51
Big Sioux River, at Akron, Iowa.....	92-93	Huron, James River, at.....	64-67
at Watertown.....	76	at 21st Street at.....	97
below Watertown.....	97	Hydrologic bench-mark station, definition of...	8
near Brandon.....	89-90	Inlet Canal near Belle Fourche.....	44-47
near Brookings.....	80-81	Instantaneous discharge, definition of.....	3
near Dell Rapids.....	82-87	International hydrologic decade (IHD) river	
Big Sioux River basin, miscellaneous		station, definition of.....	8
analyses in.....	97	Introduction.....	1
water quality records in.....	76-93	Irrigation network station, definition of....	8
Biochemical oxygen demand (BOD), definition		James River, at Columbia.....	60-63
of.....	2	at Huron.....	64-67
Brandon, Big Sioux River near.....	89-90	at 21st Street at Huron.....	97
Brookings, Big Sioux River near.....	80-81	near Mitchell.....	68-71
Sixmile Creek near.....	79	near Scotland.....	72-74
Buffalo Gap, Cheyenne River near.....	24-27	James River basin, miscellaneous	
Brule Creek near Lower Brule.....	94-96	analyses in.....	97
Canton, Beaver Creek near.....	97	water quality records in.....	60-74
Campbell Creek near Fort Thompson.....	94-96	Joe Creek near DeGrey.....	94-96
Castle Creek above Deerfield Reservoir,		Kennebec, Cedar Creek near.....	94-96
near Hill City.....	28-31	Lakes and reservoirs:	
Castlewood, Stray Horse Creek near.....	77	Mitchell Lake near Mitchell.....	97
Cedar Creek near Kennebec.....	94-96	Lower Brule, Brule Creek near.....	94-96
Cfs-day, definition of.....	2	Medicine Creek near.....	94-96
Chemical oxygen demand (COD), definition of...	2	Map showing location of surface-water-	
Cheyenne River, at Edgemont.....	17-19	quality stations.....	V
below Angostura Dam.....	20-23	Mean concentration, definition of.....	6
near Buffalo Gap.....	24-27	Mean discharge, definition of.....	3
Cheyenne River basin, miscellaneous		Medicine Creek near Lower Brule.....	94-96
analyses in.....	94	Methylene blue active substance (MBAS)	
water quality records in.....	16-58	definition of.....	3
Coliform organisms, definition of.....	2	Micrograms per liter (ug/L, UG/L),	
Collection and examination of samples.....	10-13	definition of.....	3
Columbia, James River at.....	60-63	Milligrams per liter (mg/L, MG/L),	
Conversion factors, table of.....	5	definition of.....	4
Cooperation.....	2	Miscellaneous analyses of lakes and streams	
Corson, Split Rock Creek at.....	91	in South Dakota.....	94-97
Crow Creek near Shelby.....	94-96	Missouri River, at Yankton.....	59
Cubic foot per second (cfs), definition of....	3	at Lake Sharpe Spillway near Fort Thompson..	94-96
Definition of terms and abbreviations.....	2-8	Mitchell, James River near.....	68-71
Deerfield, Castle Creek above, near Hill City..	28-31	Mitchell Lake near.....	97
DeGrey, Joe Creek near.....	94-96	Newcastle, Wyo., Beaver Creek (tributary to	
Dell Rapids, Big Sioux River near.....	82-87	Cheyenne River) near.....	16
Discharge, definition of.....	3		
mean, definition of.....	3		
instantaneous, definition of.....	3		
Downstream order and station number.....	9		
Drainage area, definition of.....	3		
Drainage basin, definition of.....	3		

	Page		Page
Partial-record station, definition of.....	4	Streamflow, definition of.....	7
Particle size, definition of.....	4	Sturgis, Belle Fourche River near.....	52-55
Particle-size classification, definition of....	4	Suspended sediment, definition of.....	6
Pactola Dam, Rapid Creek below.....	32-35	Suspended-sediment concentration, definition of.....	6
Plankton, definition of.....	5	discharge, definition of.....	6
Radiochemical program, definition of.....	9	Terms and abbreviations, definition of.....	2-8
Rapid City, Rapid Creek below sewage plant near.....	94	Temperature.....	12
Rapid Creek, below Pactola Dam.....	32-35	Thermograph, definition of.....	7
below sewage plant, near Rapid City.....	94	Time-weighted average, definition of.....	7
near Farmingdale.....	36-39	Tons per acre-foot, definition of.....	7
References, selected.....	14-15	Tons per day, definition of.....	7
Reservoirs, <u>See</u> Lakes and reservoirs.....		Total sediment discharge, definition of.....	6
Samples, collection and examination of.....	9-13	Vale, Horse Creek near.....	48-51
Sediment.....	12-13	Vermillion River near Wakonda.....	75
Sediment, definition of.....	6	Vermillion River basin, water quality records in.....	75
discharge, definition of.....	6	Wakonda, Vermillion River near.....	75
Scotland, James River near.....	72-74	Watertown, Willow Creek near.....	76
Shelby, Crow Creek near.....	94-96	Big Sioux River at.....	76
Sioux Falls, Skunk Creek near.....	88	Big Sioux River below.....	97
Sixmile Creek near Brookings.....	79	Water-supply papers.....	13
Skunk Creek near Sioux Falls.....	88	Weighted average.....	7
Slim Butte, White River at.....	96	White River at Slim Butte.....	96
Sodium adsorption ratio (SAR) definition of.....	6	White River basin, miscellaneous analyses in.....	96
Solutes.....	11-12	Willow Creek near Watertown.....	76
Solute, definition of.....	7	Wyoming-South Dakota State line, Belle Fourche River at.....	40-43
Special networks and programs.....	8-9	Yankton, Missouri River at.....	59
Specific conductance, definition of.....	7		
Split Rock Creek at Corson.....	91		
Station numbers.....	9		
Stray Horse Creek near Castlewood.....	77		

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