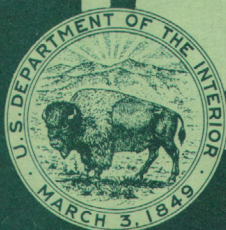
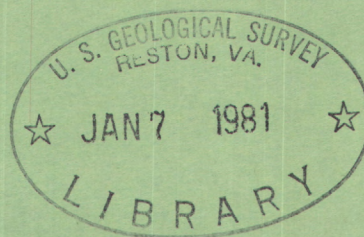


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1972  
pt. 2

# 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 1972

## OCTOBER 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 |    |    |    |    |    |    |

## NOVEMBER 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 |    |    |    |    |

## DECEMBER 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 |

## JANUARY 1972

| 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 1972

| 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 |    |    |    |    |

## MARCH 1972

| 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 1972

| 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 1972

| 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 1972

| 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 1972

| 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 1972

| 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 1972

| 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 |    |    |    |    |    |    |



1972

**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

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

Water resources records, 1972, 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



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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]

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

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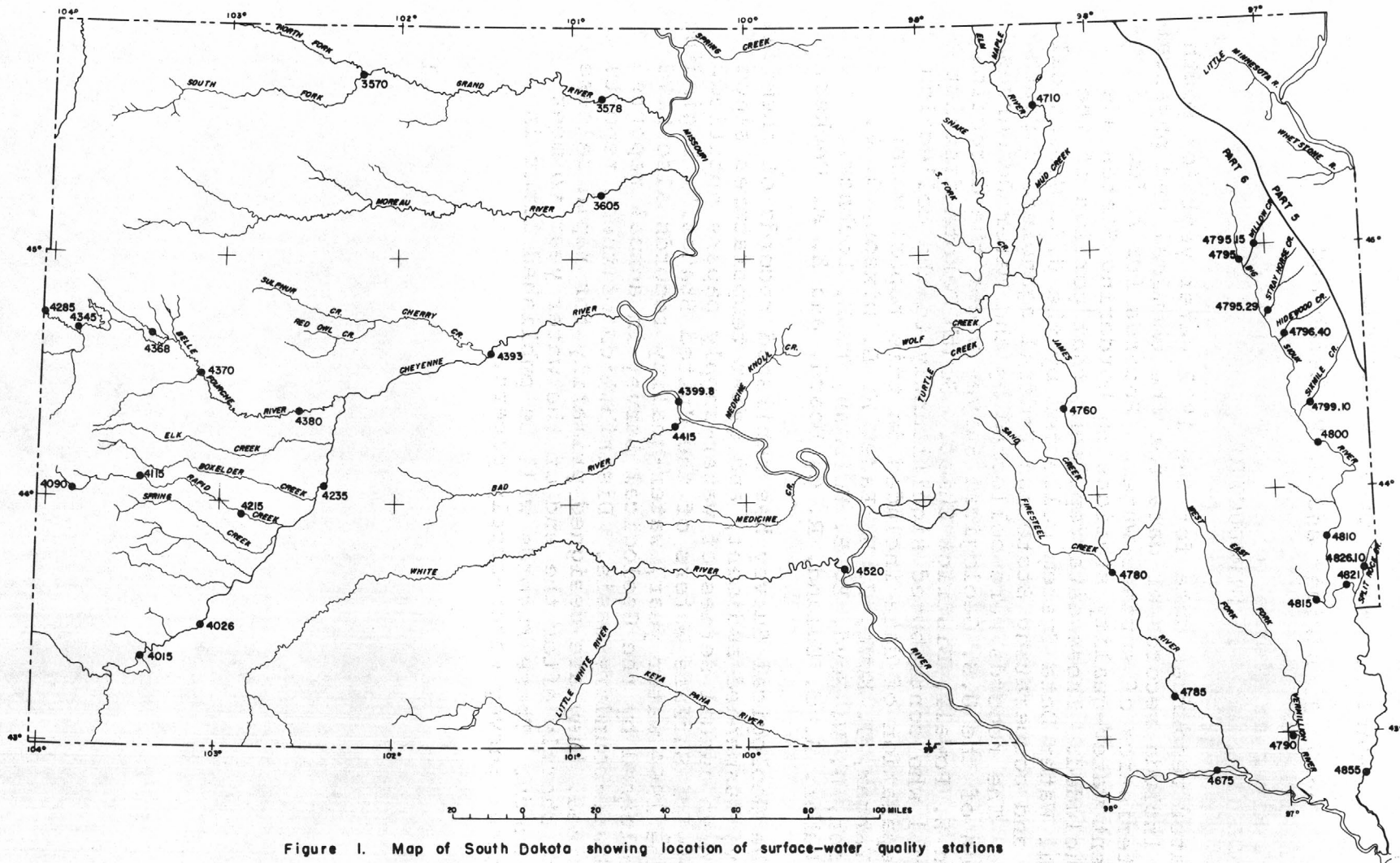


Figure 1. Map of South Dakota showing location of surface-water quality stations

# WATER RESOURCES DATA FOR SOUTH DAKOTA, 1972

## Part 2. Water Quality Records

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

### INTRODUCTION

Water resources data for the 1972 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, D. W. Heyd, E. B. Hoffman, T. K. Lockner, L. G. Huber, R. C. Ugland, R. C. Beard, 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 ( $\text{CaCO}_3$ ).

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-<br/>ply by</u> | <u>Ion</u>                                   | <u>Multi-<br/>ply by</u> |
|-----------------------------------------------|--------------------------|----------------------------------------------|--------------------------|
| Aluminum (Al <sup>+3</sup> )*...              | 0.11119                  | Iodide (I <sup>-1</sup> ).....               | 0.00788                  |
| Ammonia as NH <sub>4</sub> <sup>+1</sup> ...  | .05544                   | Iron (Fe <sup>+3</sup> )*.....               | .05372                   |
| Barium (Ba <sup>+2</sup> ).....               | .01456                   | Lead (Pb <sup>+2</sup> )*.....               | .00965                   |
| Bicarbonate (HCO <sub>3</sub> <sup>-1</sup> ) | .01639                   | Lithium (Li <sup>+1</sup> )*...              | .14411                   |
| Bromide (Br <sup>-1</sup> ).....              | .01251                   | Magnesium (Mg <sup>+2</sup> )..              | .08226                   |
| Calcium (Ca <sup>+2</sup> ).....              | .04990                   | Manganese (Mn <sup>+2</sup> )*.              | .03640                   |
| Carbonate (CO <sub>3</sub> <sup>-2</sup> )..  | .03333                   | Nickel (Ni <sup>+2</sup> )*....              | .03406                   |
| Chloride (Cl <sup>-1</sup> )....              | .02821                   | Nitrate (NO <sub>3</sub> <sup>-1</sup> )...  | .01613                   |
| Chromium (Cr <sup>+6</sup> )*...              | .11539                   | Nitrite (NO <sub>2</sub> <sup>-1</sup> )...  | .02174                   |
| Cobalt (Co <sup>+2</sup> )*.....              | .03394                   | Phosphate (PO <sub>4</sub> <sup>-3</sup> ).. | .03159                   |
| Copper (Cu <sup>+2</sup> )*.....              | .03148                   | Potassium (K <sup>+1</sup> )...              | .02557                   |
| Cyanide (CN <sup>-1</sup> ).....              | .03844                   | Sodium (Na <sup>+1</sup> ).....              | .04350                   |
| Fluoride (F <sup>-1</sup> ).....              | .05264                   | Strontium (Sr <sup>+2</sup> )*.              | .02283                   |
| Hydrogren (H <sup>+1</sup> )....              | .99209                   | Sulfate (SO <sub>4</sub> <sup>-2</sup> )...  | .02082                   |
| Hydroxide (OH <sup>-1</sup> )...              | .05880                   | Zinc (Zn <sup>+2</sup> )*.....               | .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<br>concentration<br>in 1000<br>mg/l | Di-<br>vide<br>by | Range of<br>concentration<br>in 1000<br>mg/l | Di-<br>vide<br>by | Range of<br>concentration<br>in 1000<br>mg/l | Di-<br>vide<br>by | Range of<br>concentration<br>in 1000<br>mg/l | Di-<br>vide<br>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, 1972 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 ( $^{\circ}\text{C}$ ) to degrees Fahrenheit ( $^{\circ}\text{F}$ )\*  
(Temperature reported to nearest  $0.5^{\circ}\text{C}$ )

| $^{\circ}\text{C}$ | $^{\circ}\text{F}$ | $^{\circ}\text{C}$ | $^{\circ}\text{F}$ | $^{\circ}\text{C}$ | $^{\circ}\text{F}$ | $^{\circ}\text{C}$ | $^{\circ}\text{F}$ | $^{\circ}\text{C}$ | $^{\circ}\text{F}$ |
|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 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                |

\*C =  $5/9$  ( $^{\circ}\text{F} - 32$ ) 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 1947-72

| Year | Parts<br>5-6 | Year | Parts<br>5-6 | Year | Parts<br>5-6 |
|------|--------------|------|--------------|------|--------------|
| 1947 | 1102         | 1957 | 1521         | 1967 | 2013         |
| 1948 | 1132         | 1958 | 1572         | 1968 | AB2094       |
| 1949 | 1162         | 1959 | 1643         | 1969 | AC2095       |
| 1950 | 1187         | 1960 | 1743         | 1969 | AB2144       |
| 1951 | 1198         | 1961 | 1883         |      | AC2145       |
| 1952 | 1251         | 1962 | 1943         | 1970 | AB2154       |
| 1953 | 1291         | 1963 | 1949         |      | AC2155       |
| 1954 | 1351         | 1964 | 1956         | 1971 | D            |
| 1955 | 1401         | 1965 | 1963         | 1972 | D            |
| 1956 | 1451         | 1966 | 1993         |      |              |

A In press.

B Part 5.

C Part 6.

D Not assigned.



## 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.

## GRAND RIVER BASIN

06357800 GRAND RIVER AT LITTLE EAGLE, S. DAK.

LOCATION.--Lat 45°30'28", long 100°49'04", in NE¼NE¼ sec.32, T.20 N., R.37 E., Corson County, at gaging station, on left bank at downstream side of bridge on State Highway 63, 1.3 miles southwest of Little Eagle and 4.7 miles downstream from Little Oak Creek.

DRAINAGE AREA.--5,370 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: June 1972.

Sediment records: October 1971 to September 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE<br>15... | 1130 | 366                                | 5.7                                                     | 41                                                          | 21                                                                 | 180                                                   | 8.0                                                               | 311                                             | 350                                                     | 5.7                                                          | .3                                                          | .01                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis, 0.0 mg/l.

## PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | NUMBER<br>OF<br>SAM-<br>PLING<br>POINTS<br>(00063) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(80158) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM<br>(80159) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM<br>(80160) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM<br>(80161) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>1.00 MM<br>(80162) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>2.00 MM<br>(80169) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>4.00 MM<br>(80170) |
|---------------|------|----------------------------------------|----------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|
| JULY<br>24... | 1400 | 27.5                                   | 1                                                  | 113                                                      | --                                                                    | 0                                                                     | 60                                                                    | 97                                                                    | 100                                                                   | --                                                                    | --                                                                    |
| AUG.<br>14... | 1540 | 30.0                                   | 1                                                  | 99                                                       | 0                                                                     | 1                                                                     | 50                                                                    | 89                                                                    | 95                                                                    | 98                                                                    | 100                                                                   |
| SEP.<br>19... | 1330 | 22.0                                   | --                                                 | 108                                                      | --                                                                    | 0                                                                     | 68                                                                    | 94                                                                    | 98                                                                    | 99                                                                    | 100                                                                   |

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | OCTOBER                    |                                      |                                     | NOVEMBER                   |                                      |                                     | DECEMBER                   |                                      |                                     |
|-------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 121                        | 400                                  | 131                                 | 144                        | 350                                  | 136                                 | 90                         | 200                                  | 49                                  |
| 2     | 306                        | 5700                                 | 4710                                | 191                        | 460                                  | 237                                 | 90                         | 190                                  | 46                                  |
| 3     | 250                        | 3150                                 | 2130                                | 160                        | 400                                  | 173                                 | 95                         | 195                                  | 50                                  |
| 4     | 150                        | 2500                                 | 1010                                | 134                        | 300                                  | 109                                 | 95                         | 190                                  | 49                                  |
| 5     | 80                         | 2100                                 | 454                                 | 116                        | 250                                  | 78                                  | 90                         | 185                                  | 45                                  |
| 6     | 60                         | 1800                                 | 292                                 | 90                         | 200                                  | 49                                  | 90                         | 180                                  | 44                                  |
| 7     | 50                         | 1500                                 | 203                                 | 65                         | 150                                  | 26                                  | 90                         | 175                                  | 43                                  |
| 8     | 41                         | 1200                                 | 133                                 | 70                         | 200                                  | 38                                  | 85                         | 180                                  | 41                                  |
| 9     | 50                         | 900                                  | 122                                 | 75                         | 250                                  | 51                                  | 85                         | 185                                  | 42                                  |
| 10    | 41                         | 700                                  | 77                                  | 150                        | 300                                  | 122                                 | 85                         | 170                                  | 39                                  |
| 11    | 39                         | 500                                  | 53                                  | 180                        | 350                                  | 170                                 | 85                         | 165                                  | 38                                  |
| 12    | 35                         | 300                                  | 28                                  | 200                        | 400                                  | 216                                 | 80                         | 175                                  | 38                                  |
| 13    | 32                         | 250                                  | 22                                  | 200                        | 350                                  | 189                                 | 80                         | 170                                  | 37                                  |
| 14    | 30                         | 200                                  | 16                                  | 180                        | 300                                  | 146                                 | 80                         | 160                                  | 35                                  |
| 15    | 29                         | 150                                  | 12                                  | 160                        | 250                                  | 108                                 | 80                         | 165                                  | 36                                  |
| 16    | 29                         | 130                                  | 10                                  | 145                        | 250                                  | 98                                  | 85                         | 155                                  | 36                                  |
| 17    | 31                         | 110                                  | 9.2                                 | 120                        | 220                                  | 71                                  | 95                         | 150                                  | 38                                  |
| 18    | 120                        | 1750                                 | 567                                 | 110                        | 220                                  | 65                                  | 100                        | 200                                  | 54                                  |
| 19    | 263                        | 2050                                 | 1460                                | 110                        | 250                                  | 74                                  | 100                        | 200                                  | 54                                  |
| 20    | 493                        | 3200                                 | 4260                                | 110                        | 230                                  | 68                                  | 102                        | 190                                  | 52                                  |
| 21    | 326                        | 1700                                 | 1500                                | 110                        | 220                                  | 65                                  | 100                        | 195                                  | 53                                  |
| 22    | 224                        | 1150                                 | 696                                 | 100                        | 210                                  | 57                                  | 100                        | 190                                  | 51                                  |
| 23    | 191                        | 900                                  | 464                                 | 100                        | 210                                  | 57                                  | 95                         | 190                                  | 49                                  |
| 24    | 170                        | 750                                  | 344                                 | 100                        | 205                                  | 55                                  | 95                         | 185                                  | 47                                  |
| 25    | 150                        | 650                                  | 263                                 | 100                        | 205                                  | 55                                  | 90                         | 180                                  | 44                                  |
| 26    | 138                        | 550                                  | 205                                 | 95                         | 210                                  | 54                                  | 85                         | 190                                  | 44                                  |
| 27    | 128                        | 425                                  | 147                                 | 95                         | 190                                  | 49                                  | 85                         | 185                                  | 42                                  |
| 28    | 122                        | 350                                  | 115                                 | 95                         | 200                                  | 51                                  | 85                         | 180                                  | 41                                  |
| 29    | 125                        | 280                                  | 95                                  | 90                         | 195                                  | 47                                  | 90                         | 175                                  | 43                                  |
| 30    | 111                        | 200                                  | 60                                  | 90                         | 200                                  | 49                                  | 90                         | 180                                  | 44                                  |
| 31    | 141                        | 300                                  | 114                                 | --                         | --                                   | --                                  | 95                         | 180                                  | 46                                  |
| TOTAL | 4076                       | --                                   | 19702.2                             | 3685                       | --                                   | 2763                                | 2792                       | --                                   | 1370                                |

## GRAND RIVER BASIN

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06357800 GRAND RIVER AT LITTLE EAGLE, S. DAK.--Continued

## EXTREMES.--1971-72:

Sediment concentrations: Maximum daily, 19,000 mg/l May 2; minimum daily, 110 mg/l Oct. 17.  
 Sediment discharge: Maximum daily, 259,000 tons Mar. 12; minimum daily, 9.2 tons Oct. 17.

REMARKS.--Sediment discharge record poor. Flow affected by ice Nov. 6 to Mar. 16. Suspended-sediment concentration records prior to July 1 furnished by District office, Corps of Engineers, Omaha, Nebr. Sediment-discharge records prior to Oct. 1, 1971, are on file in the District office, Corps of Engineers, Omaha, Nebr. Miscellaneous samples for chemical data published for water years 1956, 1969.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE       | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORDON (B) (UG/L) (01020) | DIS-SOLVED SOLIDS (SUM OF TUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM ADSORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICRO-MHDS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|------------|------------------------------------------|-------------------------------------|--------------------------------------|--------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|-------------------------------------------|--------------------|-----------------------------|
| JUNE 15... | .030                                     | .21                                 | 290                                  | 765                                              | 1.14                                       | 756                                      | 190                              | 0                                     | 5.7                             | 1170                                      | 7.8                | 22.5                        |

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | JANUARY              |                           |                               | FEBRUARY             |                           |                               | MARCH                |                           |                               |
|-------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|-------------------------------|
|       | 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     | 90                   | 180                       | 44                            | 75                   | 150                       | 30                            | 80                   | 170                       | 37                            |
| 2     | 90                   | 180                       | 44                            | 70                   | 145                       | 27                            | 80                   | 170                       | 37                            |
| 3     | 85                   | 175                       | 40                            | 70                   | 150                       | 28                            | 85                   | 180                       | 41                            |
| 4     | 80                   | 175                       | 38                            | 65                   | 160                       | 28                            | 90                   | 190                       | 46                            |
| 5     | 85                   | 180                       | 41                            | 65                   | 155                       | 27                            | 100                  | 200                       | 54                            |
| 6     | 85                   | 175                       | 40                            | 70                   | 150                       | 28                            | 150                  | 300                       | 122                           |
| 7     | 90                   | 185                       | 45                            | 70                   | 150                       | 28                            | 200                  | 500                       | 270                           |
| 8     | 90                   | 180                       | 44                            | 70                   | 150                       | 28                            | 300                  | 800                       | 648                           |
| 9     | 90                   | 175                       | 43                            | 75                   | 145                       | 29                            | 500                  | 1200                      | 1620                          |
| 10    | 90                   | 170                       | 41                            | 75                   | 150                       | 30                            | 1500                 | 2500                      | 10100                         |
| 11    | 85                   | 175                       | 40                            | 80                   | 160                       | 35                            | 8000                 | 6000                      | 130000                        |
| 12    | 85                   | 180                       | 41                            | 80                   | 165                       | 36                            | 12000                | 8000                      | 259000                        |
| 13    | 80                   | 175                       | 38                            | 85                   | 160                       | 37                            | 10000                | 5000                      | 135000                        |
| 14    | 70                   | 170                       | 32                            | 90                   | 155                       | 38                            | 9300                 | 10000                     | 251000                        |
| 15    | 75                   | 170                       | 34                            | 85                   | 160                       | 37                            | 8500                 | 9000                      | 207000                        |
| 16    | 85                   | 170                       | 39                            | 85                   | 160                       | 37                            | 7500                 | 7500                      | 152000                        |
| 17    | 85                   | 165                       | 38                            | 85                   | 165                       | 38                            | 6670                 | 6600                      | 119000                        |
| 18    | 80                   | 170                       | 37                            | 80                   | 160                       | 35                            | 4840                 | 5700                      | 74500                         |
| 19    | 80                   | 165                       | 36                            | 85                   | 155                       | 36                            | 3670                 | 4800                      | 47600                         |
| 20    | 75                   | 160                       | 32                            | 90                   | 150                       | 36                            | 2930                 | 4000                      | 31600                         |
| 21    | 75                   | 165                       | 33                            | 90                   | 170                       | 41                            | 2380                 | 3600                      | 23100                         |
| 22    | 70                   | 170                       | 32                            | 85                   | 165                       | 38                            | 2010                 | 3300                      | 17900                         |
| 23    | 70                   | 165                       | 31                            | 80                   | 160                       | 35                            | 1770                 | 3000                      | 14300                         |
| 24    | 70                   | 160                       | 30                            | 80                   | 160                       | 35                            | 1500                 | 2700                      | 10900                         |
| 25    | 65                   | 160                       | 28                            | 85                   | 160                       | 37                            | 1270                 | 2400                      | 8230                          |
| 26    | 65                   | 165                       | 29                            | 90                   | 165                       | 40                            | 1190                 | 2200                      | 7070                          |
| 27    | 70                   | 160                       | 30                            | 90                   | 165                       | 40                            | 1050                 | 2000                      | 5670                          |
| 28    | 70                   | 155                       | 29                            | 90                   | 165                       | 40                            | 979                  | 1900                      | 5020                          |
| 29    | 75                   | 150                       | 30                            | 90                   | 165                       | 40                            | 929                  | 1900                      | 4770                          |
| 30    | 80                   | 145                       | 31                            | --                   | --                        | --                            | 935                  | 2200                      | 5550                          |
| 31    | 77                   | 150                       | 31                            | --                   | --                        | --                            | 941                  | 2400                      | 6100                          |
| TOTAL | 2462                 | --                        | 1121                          | 2330                 | --                        | 994                           | 91449                | --                        | 1528285                       |



## GRAND RIVER BASIN

06357800 GRAND RIVER AT LITTLE EAGLE, S. DAK.--Continued

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| 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                                                  | 905                  | 2400                      | 5860                          | 757                  | 3400                      | 6950                          | 1840                 | 8200                      | 40700                         |
| 2                                                  | 886                  | 2400                      | 5740                          | 3510                 | 19000                     | 180000                        | 1580                 | 6600                      | 28200                         |
| 3                                                  | 826                  | 2300                      | 5130                          | 3360                 | 12000                     | 109000                        | 1350                 | 5600                      | 20400                         |
| 4                                                  | 761                  | 2300                      | 4730                          | 1460                 | 7600                      | 30000                         | 1200                 | 4800                      | 15600                         |
| 5                                                  | 714                  | 2200                      | 4240                          | 911                  | 4500                      | 11100                         | 1050                 | 4000                      | 11300                         |
| 6                                                  | 714                  | 2200                      | 4240                          | 767                  | 3500                      | 7250                          | 911                  | 3400                      | 8360                          |
| 7                                                  | 773                  | 2800                      | 5840                          | 703                  | 2800                      | 5310                          | 814                  | 3100                      | 6810                          |
| 8                                                  | 714                  | 2400                      | 4630                          | 500                  | 2500                      | 3380                          | 708                  | 2800                      | 5350                          |
| 9                                                  | 663                  | 2000                      | 3580                          | 421                  | 2200                      | 2500                          | 652                  | 2600                      | 4580                          |
| 10                                                 | 657                  | 1800                      | 3190                          | 387                  | 2000                      | 2090                          | 560                  | 2500                      | 3780                          |
| 11                                                 | 669                  | 1500                      | 2710                          | 430                  | 3000                      | 3480                          | 519                  | 2400                      | 3360                          |
| 12                                                 | 680                  | 1200                      | 2200                          | 982                  | 6000                      | 15900                         | 490                  | 2300                      | 3040                          |
| 13                                                 | 685                  | 900                       | 1660                          | 1560                 | 10000                     | 42100                         | 475                  | 2200                      | 2820                          |
| 14                                                 | 697                  | 800                       | 1510                          | 1080                 | 7100                      | 20700                         | 408                  | 2100                      | 2310                          |
| 15                                                 | 680                  | 780                       | 1430                          | 892                  | 6000                      | 14500                         | 366                  | 2000                      | 1980                          |
| 16                                                 | 635                  | 760                       | 1300                          | 808                  | 5200                      | 11300                         | 354                  | 1800                      | 1720                          |
| 17                                                 | 362                  | 750                       | 733                           | 749                  | 4500                      | 9100                          | 334                  | 1700                      | 1530                          |
| 18                                                 | 267                  | 730                       | 526                           | 732                  | 4200                      | 8300                          | 319                  | 1600                      | 1380                          |
| 19                                                 | 236                  | 710                       | 452                           | 737                  | 3800                      | 7560                          | 307                  | 1500                      | 1240                          |
| 20                                                 | 216                  | 700                       | 408                           | 714                  | 3700                      | 7130                          | 319                  | 1800                      | 1550                          |
| 21                                                 | 203                  | 680                       | 373                           | 691                  | 3700                      | 6900                          | 334                  | 2500                      | 2250                          |
| 22                                                 | 194                  | 660                       | 346                           | 823                  | 4400                      | 9780                          | 281                  | 2300                      | 1750                          |
| 23                                                 | 179                  | 650                       | 314                           | 1780                 | 9800                      | 47100                         | 257                  | 2100                      | 1460                          |
| 24                                                 | 173                  | 620                       | 290                           | 1960                 | 9800                      | 51900                         | 239                  | 1800                      | 1160                          |
| 25                                                 | 173                  | 600                       | 280                           | 1230                 | 7500                      | 24900                         | 226                  | 1700                      | 1040                          |
| 26                                                 | 171                  | 590                       | 272                           | 1060                 | 6400                      | 18300                         | 194                  | 1600                      | 838                           |
| 27                                                 | 168                  | 580                       | 263                           | 2370                 | 13300                     | 85100                         | 176                  | 1500                      | 713                           |
| 28                                                 | 171                  | 570                       | 263                           | 2170                 | 10500                     | 61500                         | 168                  | 1400                      | 635                           |
| 29                                                 | 176                  | 560                       | 266                           | 2360                 | 9500                      | 60500                         | 157                  | 1300                      | 551                           |
| 30                                                 | 185                  | 550                       | 275                           | 3710                 | 16700                     | 167000                        | 152                  | 1200                      | 492                           |
| 31                                                 | --                   | --                        | --                            | 2220                 | 10600                     | 63500                         | --                   | --                        | --                            |
| TOTAL                                              | 14533                | --                        | 63051                         | 41834                | --                        | 1094130                       | 16740                | --                        | 176899                        |
|                                                    |                      |                           |                               |                      |                           |                               |                      |                           |                               |
| 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                                                  | 144                  | 1100                      | 428                           | 157                  | 850                       | 360                           | 105                  | 260                       | 74                            |
| 2                                                  | 135                  | 1000                      | 365                           | 139                  | 700                       | 263                           | 107                  | 255                       | 74                            |
| 3                                                  | 130                  | 900                       | 316                           | 127                  | 550                       | 189                           | 110                  | 250                       | 74                            |
| 4                                                  | 125                  | 800                       | 270                           | 125                  | 450                       | 152                           | 107                  | 245                       | 71                            |
| 5                                                  | 125                  | 750                       | 253                           | 123                  | 400                       | 133                           | 107                  | 240                       | 69                            |
| 6                                                  | 121                  | 600                       | 196                           | 116                  | 350                       | 110                           | 107                  | 235                       | 68                            |
| 7                                                  | 121                  | 550                       | 180                           | 110                  | 320                       | 95                            | 107                  | 236                       | 68                            |
| 8                                                  | 121                  | 500                       | 163                           | 110                  | 300                       | 89                            | 107                  | 230                       | 66                            |
| 9                                                  | 123                  | 450                       | 149                           | 103                  | 280                       | 78                            | 107                  | 225                       | 65                            |
| 10                                                 | 121                  | 400                       | 131                           | 101                  | 260                       | 71                            | 105                  | 220                       | 62                            |
| 11                                                 | 125                  | 350                       | 118                           | 103                  | 240                       | 67                            | 105                  | 215                       | 61                            |
| 12                                                 | 147                  | 400                       | 159                           | 99                   | 220                       | 59                            | 105                  | 210                       | 60                            |
| 13                                                 | 165                  | 500                       | 223                           | 101                  | 210                       | 57                            | 107                  | 205                       | 59                            |
| 14                                                 | 163                  | 450                       | 198                           | 101                  | 208                       | 57                            | 107                  | 200                       | 58                            |
| 15                                                 | 142                  | 400                       | 153                           | 97                   | 205                       | 54                            | 105                  | 195                       | 55                            |
| 16                                                 | 130                  | 375                       | 132                           | 95                   | 205                       | 53                            | 105                  | 190                       | 54                            |
| 17                                                 | 123                  | 350                       | 116                           | 97                   | 202                       | 53                            | 105                  | 185                       | 52                            |
| 18                                                 | 121                  | 325                       | 106                           | 110                  | 200                       | 59                            | 105                  | 180                       | 51                            |
| 19                                                 | 116                  | 300                       | 94                            | 137                  | 550                       | 203                           | 103                  | 180                       | 50                            |
| 20                                                 | 112                  | 300                       | 91                            | 114                  | 300                       | 92                            | 103                  | 175                       | 49                            |
| 21                                                 | 125                  | 350                       | 118                           | 123                  | 200                       | 66                            | 103                  | 170                       | 47                            |
| 22                                                 | 165                  | 500                       | 223                           | 165                  | 460                       | 205                           | 103                  | 165                       | 46                            |
| 23                                                 | 149                  | 350                       | 141                           | 163                  | 400                       | 176                           | 103                  | 160                       | 44                            |
| 24                                                 | 118                  | 264                       | 84                            | 139                  | 300                       | 113                           | 103                  | 155                       | 43                            |
| 25                                                 | 114                  | 250                       | 77                            | 130                  | 295                       | 104                           | 110                  | 175                       | 52                            |
| 26                                                 | 118                  | 240                       | 76                            | 125                  | 290                       | 98                            | 116                  | 250                       | 78                            |
| 27                                                 | 121                  | 230                       | 75                            | 118                  | 285                       | 91                            | 121                  | 240                       | 78                            |
| 28                                                 | 121                  | 220                       | 72                            | 114                  | 280                       | 86                            | 121                  | 230                       | 75                            |
| 29                                                 | 229                  | 1250                      | 773                           | 110                  | 275                       | 82                            | 118                  | 215                       | 68                            |
| 30                                                 | 274                  | 1700                      | 1260                          | 110                  | 270                       | 80                            | 118                  | 200                       | 64                            |
| 31                                                 | 191                  | 1150                      | 593                           | 105                  | 265                       | 75                            | --                   | --                        | --                            |
| TOTAL                                              | 4335                 | --                        | 7333                          | 3667                 | --                        | 3470                          | 3235                 | --                        | 1835                          |
| TOTAL DISCHARGE FOR YEAR (CFS-DAYS)                |                      |                           |                               |                      |                           |                               |                      |                           | 191138                        |
| TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) |                      |                           |                               |                      |                           |                               |                      |                           | 2900953.2                     |

MOREAU RIVER BASIN

19

06360500 MOREAU RIVER NEAR WHITEHORSE, S. DAK.

LOCATION.--Lat 45°15'21", long 100°50'33", in SW¼SE¼ sec.17, T.15 N., R.27 E., Dewey County, at gaging station, on left bank 10 ft downstream from bridge, 2.4 miles southeast of Whitehorse, 8.8 miles downstream from Little Moreau River, and 16.3 miles southeast of Timber Lake.

DRAINAGE AREA.--4,880 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: June 1972.  
Sediment records: October 1971 to September 1972.

EXTREMES.--1971-72:

Sediment concentrations: Maximum daily, 20,000 mg/l May 1; minimum daily, no flow Jan. 27-29, Feb. 3-5, Sept. 16-30.

Sediment discharge: Maximum daily, 239,000 tons Mar. 15; minimum daily, 0 tons Jan. 27-29, Feb. 3-5, Sept. 16-30.

REMARKS.--Records poor. No flow Jan. 27-29, Feb. 3-5, Sept. 17-31. Flow affected by ice Nov. 19 to Mar. 15. Suspended-sediment concentrations prior to July 1 furnished by District office, Corps of Engineers, Omaha, Nebr. Sediment-discharge records prior to Oct. 1, 1971, are on file in the District office, Corps of Engineers, Omaha, Nebr. Miscellaneous samples for chemical data published for water year 1969.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060)                                  | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915)          | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930)       | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440)              | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940)          | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|---------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE<br>15... | 1100 | 324                                                                 | 7.8                                                     | 50                                                                   | 12                                                                 | 97                                                          | 6.6                                                               | 159                                                          | 240                                                     | 3.9                                                                   | .3                                                          | .16                                                                      |
| DATE          | TIME | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(MG/L)<br>(01020)     | DIS-<br>SOLVED<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303)      | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900)                     | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931)      | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400)                                    | TEMPER-<br>ATURE<br>(DEG C)<br>(00013)                                   |
| JUNE<br>15... | .060 | 1.1                                                                 | 150                                                     | 497                                                                  | .73                                                                | 435                                                         | 170                                                               | 44                                                           | 3.2                                                     | 744                                                                   | 7.5                                                         | 21.0                                                                     |

NOTE.--Carbonate (CO<sub>3</sub>) analysis, 0.0 mg/l.

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | MEAN<br>DISCHARGE<br>(CFS) | OCTOBER                              |                                     |  | NOVEMBER                   |                                      |                                     | DECEMBER                   |                                      |                                     |
|-------|----------------------------|--------------------------------------|-------------------------------------|--|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|
|       |                            | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |  | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 71                         | 100                                  | 19                                  |  | 80                         | 750                                  | 162                                 | 25                         | 45                                   | 3.0                                 |
| 2     | 617                        | 2900                                 | 4830                                |  | 52                         | 704                                  | 99                                  | 25                         | 45                                   | 3.0                                 |
| 3     | 235                        | 1950                                 | 1240                                |  | 45                         | 610                                  | 74                                  | 26                         | 45                                   | 3.2                                 |
| 4     | 111                        | 1000                                 | 300                                 |  | 35                         | 525                                  | 50                                  | 27                         | 45                                   | 3.3                                 |
| 5     | 173                        | 750                                  | 350                                 |  | 30                         | 430                                  | 35                                  | 25                         | 45                                   | 3.0                                 |
| 6     | 591                        | 1000                                 | 1600                                |  | 25                         | 335                                  | 23                                  | 22                         | 45                                   | 2.7                                 |
| 7     | 570                        | 830                                  | 1280                                |  | 20                         | 240                                  | 13                                  | 20                         | 45                                   | 2.4                                 |
| 8     | 588                        | 500                                  | 794                                 |  | 25                         | 150                                  | 10                                  | 14                         | 45                                   | 1.7                                 |
| 9     | 372                        | 400                                  | 402                                 |  | 28                         | 72                                   | 5.4                                 | 12                         | 40                                   | 1.3                                 |
| 10    | 279                        | 300                                  | 226                                 |  | 28                         | 76                                   | 5.7                                 | 12                         | 40                                   | 1.3                                 |
| 11    | 192                        | 250                                  | 130                                 |  | 29                         | 70                                   | 5.5                                 | 12                         | 40                                   | 1.3                                 |
| 12    | 142                        | 200                                  | 77                                  |  | 24                         | 65                                   | 4.2                                 | 10                         | 40                                   | 1.1                                 |
| 13    | 127                        | 175                                  | 60                                  |  | 28                         | 60                                   | 4.5                                 | 6.0                        | 40                                   | .65                                 |
| 14    | 110                        | 150                                  | 45                                  |  | 21                         | 55                                   | 3.1                                 | 6.0                        | 40                                   | .65                                 |
| 15    | 96                         | 125                                  | 32                                  |  | 28                         | 48                                   | 3.6                                 | 4.0                        | 40                                   | .43                                 |
| 16    | 88                         | 100                                  | 24                                  |  | 34                         | 50                                   | 4.6                                 | 4.0                        | 40                                   | .43                                 |
| 17    | 82                         | 90                                   | 20                                  |  | 37                         | 50                                   | 5.0                                 | 4.0                        | 40                                   | .45                                 |
| 18    | 80                         | 80                                   | 17                                  |  | 30                         | 55                                   | 4.5                                 | 5.0                        | 42                                   | .57                                 |
| 19    | 203                        | 3000                                 | 1640                                |  | 30                         | 55                                   | 4.5                                 | 5.0                        | 42                                   | .57                                 |
| 20    | 150                        | 1500                                 | 608                                 |  | 31                         | 60                                   | 5.0                                 | 5.0                        | 45                                   | .61                                 |
| 21    | 100                        | 1000                                 | 270                                 |  | 31                         | 65                                   | 5.4                                 | 4.0                        | 42                                   | .45                                 |
| 22    | 62                         | 623                                  | 104                                 |  | 31                         | 97                                   | 8.1                                 | 4.0                        | 44                                   | .48                                 |
| 23    | 80                         | 1000                                 | 216                                 |  | 30                         | 80                                   | 6.5                                 | 3.0                        | 39                                   | .32                                 |
| 24    | 150                        | 2000                                 | 810                                 |  | 28                         | 50                                   | 3.8                                 | 2.5                        | 35                                   | .24                                 |
| 25    | 310                        | 5000                                 | 4190                                |  | 28                         | 50                                   | 3.8                                 | 2.0                        | 35                                   | .19                                 |
| 26    | 207                        | 3950                                 | 2210                                |  | 26                         | 50                                   | 3.5                                 | 2.0                        | 33                                   | .18                                 |
| 27    | 150                        | 2800                                 | 1130                                |  | 26                         | 45                                   | 3.2                                 | 2.5                        | 33                                   | .22                                 |
| 28    | 120                        | 2000                                 | 648                                 |  | 25                         | 45                                   | 3.0                                 | 3.0                        | 37                                   | .30                                 |
| 29    | 100                        | 1400                                 | 378                                 |  | 25                         | 45                                   | 3.0                                 | 3.5                        | 35                                   | .33                                 |
| 30    | 100                        | 1000                                 | 270                                 |  | 25                         | 45                                   | 3.0                                 | 4.0                        | 34                                   | .37                                 |
| 31    | 128                        | 792                                  | 274                                 |  | --                         | --                                   | --                                  | 4.0                        | 30                                   | .32                                 |
| TOTAL | 6384                       | --                                   | 24194                               |  | 935                        | --                                   | 564.9                               | 303.5                      | --                                   | 35.06                               |

## MOREAU RIVER BASIN

06360500 MOREAU RIVER NEAR WHITEHORSE, S. DAK.--Continued

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | JANUARY                    |                                 |                                     | FEBRUARY                   |                                 |                                     | MARCH                      |                                 |                                     |
|-------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 3.0                        | 30                              | .24                                 | .50                        | 20                              | .03                                 | 500                        | 500                             | 675                                 |
| 2     | 2.5                        | 30                              | .20                                 | .50                        | 20                              | .03                                 | 2500                       | 1000                            | 6750                                |
| 3     | 2.0                        | 28                              | .15                                 | 0                          | 0                               | 0                                   | 4000                       | 1500                            | 16200                               |
| 4     | 2.0                        | 28                              | .15                                 | 0                          | 0                               | 0                                   | 4500                       | 2000                            | 24300                               |
| 5     | 2.5                        | 30                              | .20                                 | 0                          | 0                               | 0                                   | 4000                       | 1000                            | 10800                               |
| 6     | 3.0                        | 34                              | .28                                 | .50                        | 40                              | .05                                 | 1500                       | 800                             | 3240                                |
| 7     | 4.0                        | 32                              | .35                                 | .50                        | 40                              | .05                                 | 600                        | 412                             | 667                                 |
| 8     | 4.0                        | 28                              | .30                                 | .50                        | 40                              | .05                                 | 1000                       | 750                             | 2030                                |
| 9     | 4.0                        | 26                              | .28                                 | 1.0                        | 50                              | .14                                 | 1500                       | 1000                            | 4050                                |
| 10    | 3.0                        | 26                              | .21                                 | 1.0                        | 50                              | .14                                 | 3000                       | 1500                            | 12200                               |
| 11    | 3.0                        | 24                              | .19                                 | 1.5                        | 55                              | .22                                 | 6000                       | 2000                            | 32400                               |
| 12    | 2.0                        | 25                              | .14                                 | 2.0                        | 60                              | .32                                 | 10000                      | 2300                            | 62100                               |
| 13    | 1.5                        | 20                              | .08                                 | 6.0                        | 60                              | .97                                 | 16000                      | 2500                            | 108000                              |
| 14    | 1.0                        | 19                              | .05                                 | 5.0                        | 65                              | .88                                 | 20000                      | 3550                            | 192000                              |
| 15    | 1.0                        | 26                              | .07                                 | 5.0                        | 70                              | .95                                 | 15000                      | 5900                            | 239000                              |
| 16    | 1.5                        | 26                              | .11                                 | 6.0                        | 75                              | 1.2                                 | 10900                      | 6100                            | 180000                              |
| 17    | 2.0                        | 19                              | .10                                 | 7.0                        | 72                              | 1.4                                 | 6050                       | 4750                            | 77600                               |
| 18    | 1.5                        | 21                              | .09                                 | 6.0                        | 68                              | 1.1                                 | 3540                       | 3850                            | 36800                               |
| 19    | 1.0                        | 24                              | .06                                 | 6.0                        | 65                              | 1.1                                 | 2380                       | 3150                            | 20200                               |
| 20    | 1.0                        | 18                              | .05                                 | 9.0                        | 70                              | 1.7                                 | 1710                       | 2700                            | 12500                               |
| 21    | 2.0                        | 17                              | .09                                 | 8.0                        | 70                              | 1.5                                 | 1270                       | 2300                            | 7890                                |
| 22    | 1.0                        | 20                              | .05                                 | 15                         | 80                              | 3.2                                 | 985                        | 1950                            | 5190                                |
| 23    | 1.0                        | 25                              | .07                                 | 18                         | 90                              | 4.4                                 | 822                        | 1600                            | 3550                                |
| 24    | .50                        | 25                              | .03                                 | 20                         | 90                              | 4.9                                 | 717                        | 1400                            | 2710                                |
| 25    | .50                        | 30                              | .04                                 | 30                         | 100                             | 8.1                                 | 594                        | 1150                            | 1840                                |
| 26    | .50                        | 29                              | .04                                 | 50                         | 150                             | 20                                  | 498                        | 850                             | 1140                                |
| 27    | 0                          | 0                               | 0                                   | 90                         | 200                             | 49                                  | 435                        | 700                             | 822                                 |
| 28    | 0                          | 0                               | 0                                   | 120                        | 250                             | 81                                  | 360                        | 550                             | 535                                 |
| 29    | 0                          | 0                               | 0                                   | 150                        | 300                             | 122                                 | 315                        | 450                             | 383                                 |
| 30    | 1.0                        | 40                              | .11                                 | --                         | --                              | --                                  | 277                        | 412                             | 308                                 |
| 31    | .50                        | 20                              | .03                                 | --                         | --                              | --                                  | 236                        | 366                             | 233                                 |
| TOTAL | 52.50                      | --                              | 3.76                                | 559.00                     | --                              | 304.43                              | 121189                     | --                              | 1066113                             |

MOREAU RIVER BASIN

21

06360500 MOREAU RIVER NEAR WHITEHORSE, S. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | APRIL                      |                                 |                                     | MAY                        |                                 |                                     | JUNE                       |                                 |                                     |
|-------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 219                        | 343                             | 203                                 | 1410                       | 20000                           | 76100                               | 897                        | 3300                            | 7990                                |
| 2     | 219                        | 320                             | 189                                 | 1370                       | 15500                           | 57300                               | 692                        | 2200                            | 4110                                |
| 3     | 200                        | 290                             | 157                                 | 1810                       | 15500                           | 75700                               | 567                        | 2100                            | 3210                                |
| 4     | 183                        | 268                             | 132                                 | 1500                       | 10500                           | 42500                               | 423                        | 2600                            | 2970                                |
| 5     | 179                        | 290                             | 140                                 | 1140                       | 6500                            | 20000                               | 387                        | 1800                            | 1880                                |
| 6     | 173                        | 314                             | 147                                 | 755                        | 3800                            | 7750                                | 339                        | 1400                            | 1280                                |
| 7     | 173                        | 280                             | 131                                 | 540                        | 2400                            | 3500                                | 303                        | 1080                            | 884                                 |
| 8     | 156                        | 250                             | 105                                 | 432                        | 1500                            | 1750                                | 249                        | 750                             | 504                                 |
| 9     | 147                        | 220                             | 87                                  | 390                        | 1100                            | 1160                                | 212                        | 480                             | 275                                 |
| 10    | 140                        | 190                             | 72                                  | 354                        | 1000                            | 956                                 | 183                        | 300                             | 148                                 |
| 11    | 133                        | 170                             | 61                                  | 543                        | 5200                            | 7620                                | 156                        | 100                             | 42                                  |
| 12    | 132                        | 146                             | 52                                  | 546                        | 3200                            | 4720                                | 200                        | 1200                            | 648                                 |
| 13    | 135                        | 140                             | 51                                  | 1230                       | 6000                            | 19900                               | 336                        | 1050                            | 953                                 |
| 14    | 130                        | 137                             | 48                                  | 2250                       | 11000                           | 66800                               | 339                        | 1300                            | 1190                                |
| 15    | 125                        | 140                             | 47                                  | 2490                       | 8300                            | 55800                               | 459                        | 6000                            | 7440                                |
| 16    | 114                        | 150                             | 46                                  | 1860                       | 5400                            | 27100                               | 315                        | 4700                            | 4000                                |
| 17    | 108                        | 165                             | 48                                  | 1060                       | 3800                            | 10900                               | 438                        | 5750                            | 6800                                |
| 18    | 98                         | 186                             | 49                                  | 689                        | 2700                            | 5020                                | 297                        | 4550                            | 3650                                |
| 19    | 86                         | 170                             | 39                                  | 534                        | 1800                            | 2600                                | 241                        | 3750                            | 2440                                |
| 20    | 82                         | 150                             | 33                                  | 429                        | 1200                            | 1390                                | 209                        | 3000                            | 1690                                |
| 21    | 76                         | 131                             | 27                                  | 384                        | 1200                            | 1240                                | 181                        | 2250                            | 1100                                |
| 22    | 71                         | 120                             | 23                                  | 2150                       | 3900                            | 22600                               | 156                        | 1550                            | 653                                 |
| 23    | 67                         | 110                             | 20                                  | 6190                       | 7200                            | 120000                              | 133                        | 900                             | 323                                 |
| 24    | 65                         | 100                             | 18                                  | 4470                       | 6500                            | 78400                               | 111                        | 500                             | 150                                 |
| 25    | 60                         | 90                              | 15                                  | 2050                       | 6300                            | 34900                               | 99                         | 300                             | 80                                  |
| 26    | 57                         | 75                              | 12                                  | 1440                       | 7700                            | 29900                               | 93                         | 200                             | 50                                  |
| 27    | 60                         | 60                              | 9.7                                 | 1200                       | 4900                            | 15900                               | 101                        | 250                             | 68                                  |
| 28    | 61                         | 40                              | 6.6                                 | 1730                       | 6500                            | 30400                               | 163                        | 2300                            | 1010                                |
| 29    | 64                         | 29                              | 5.0                                 | 2890                       | 8500                            | 66300                               | 381                        | 10900                           | 11200                               |
| 30    | 68                         | 100                             | 18                                  | 2330                       | 8200                            | 51600                               | 482                        | 8700                            | 11300                               |
| 31    | --                         | --                              | --                                  | 1390                       | 6250                            | 23500                               | --                         | --                              | --                                  |
| TOTAL | 3581                       | --                              | 1991.3                              | 47556                      | --                              | 963306                              | 9142                       | --                              | 78038                               |

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PEN-<br>DED<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PEN-<br>DED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) | SUS-<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.002 MM<br>(70337) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.004 MM<br>(70338) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.016 MM<br>(70340) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(70342) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
|               |      |                                        |                                                          |                                                           |                                                                              |                                                                        |                                                                        |                                                                        |                                                                        |
| JULY<br>03... | 0900 | 16.5                                   | 391                                                      | 7620                                                      | 8040                                                                         | 82                                                                     | 89                                                                     | 96                                                                     | 100                                                                    |



## MOREAU RIVER BASIN

06360500 MOREAU RIVER NEAR WHITEHORSE, S. DAK.--Continued

**SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972**

| DAY   | JULY                       |                                 |                                     | AUGUST                     |                                 |                                     | SEPTEMBER                  |                                 |                                     |
|-------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 825                        | 13100                           | 29200                               | 28                         | 209                             | 16                                  | .28                        | 295                             | .22                                 |
| 2     | 501                        | 10100                           | 13700                               | 25                         | 210                             | 14                                  | .24                        | 287                             | .19                                 |
| 3     | 351                        | 7500                            | 7110                                | 21                         | 215                             | 12                                  | .17                        | 280                             | .13                                 |
| 4     | 249                        | 5000                            | 3360                                | 21                         | 220                             | 12                                  | .17                        | 271                             | .12                                 |
| 5     | 185                        | 3000                            | 1500                                | 26                         | 225                             | 16                                  | .14                        | 300                             | .11                                 |
| 6     | 147                        | 1900                            | 754                                 | 23                         | 230                             | 14                                  | .09                        | 350                             | .09                                 |
| 7     | 119                        | 1100                            | 353                                 | 21                         | 237                             | 13                                  | .09                        | 396                             | .10                                 |
| 8     | 99                         | 625                             | 167                                 | 19                         | 230                             | 12                                  | .09                        | 400                             | .10                                 |
| 9     | 96                         | 650                             | 168                                 | 15                         | 226                             | 8.9                                 | .05                        | 410                             | .06                                 |
| 10    | 73                         | 377                             | 74                                  | 13                         | 200                             | 7.0                                 | .03                        | 420                             | .03                                 |
| 11    | 119                        | 800                             | 257                                 | 11                         | 192                             | 5.7                                 | .02                        | 430                             | .02                                 |
| 12    | 119                        | 489                             | 157                                 | 9.6                        | 190                             | 4.9                                 | .02                        | 410                             | .02                                 |
| 13    | 81                         | 370                             | 81                                  | 7.6                        | 190                             | 3.9                                 | .02                        | 400                             | .02                                 |
| 14    | 61                         | 263                             | 43                                  | 5.1                        | 189                             | 2.6                                 | .02                        | 400                             | .02                                 |
| 15    | 55                         | 240                             | 36                                  | 4.2                        | 189                             | 2.1                                 | .02                        | 390                             | .02                                 |
| 16    | 53                         | 215                             | 31                                  | 3.2                        | 190                             | 1.6                                 | .02                        | 0                               | 0                                   |
| 17    | 48                         | 192                             | 25                                  | 2.4                        | 190                             | 1.2                                 | 0                          | 0                               | 0                                   |
| 18    | 43                         | 188                             | 22                                  | 17                         | 350                             | 16                                  | 0                          | 0                               | 0                                   |
| 19    | 36                         | 185                             | 18                                  | 23                         | 350                             | 22                                  | 0                          | 0                               | 0                                   |
| 20    | 30                         | 180                             | 15                                  | 14                         | 330                             | 12                                  | 0                          | 0                               | 0                                   |
| 21    | 30                         | 175                             | 14                                  | 9.0                        | 300                             | 7.3                                 | 0                          | 0                               | 0                                   |
| 22    | 30                         | 170                             | 14                                  | 8.0                        | 280                             | 6.0                                 | 0                          | 0                               | 0                                   |
| 23    | 30                         | 165                             | 13                                  | 6.1                        | 260                             | 4.3                                 | 0                          | 0                               | 0                                   |
| 24    | 28                         | 160                             | 12                                  | 4.6                        | 265                             | 3.3                                 | 0                          | 0                               | 0                                   |
| 25    | 24                         | 165                             | 11                                  | 2.4                        | 270                             | 1.7                                 | 0                          | 0                               | 0                                   |
| 26    | 23                         | 170                             | 11                                  | 1.6                        | 280                             | 1.2                                 | 0                          | 0                               | 0                                   |
| 27    | 24                         | 184                             | 12                                  | 1.4                        | 285                             | 1.1                                 | 0                          | 0                               | 0                                   |
| 28    | 96                         | 750                             | 194                                 | .84                        | 291                             | .66                                 | 0                          | 0                               | 0                                   |
| 29    | 71                         | 400                             | 77                                  | .44                        | 290                             | .34                                 | 0                          | 0                               | 0                                   |
| 30    | 55                         | 250                             | 37                                  | .44                        | 292                             | .35                                 | 0                          | 0                               | 0                                   |
| 31    | 36                         | 250                             | 24                                  | .38                        | 294                             | .30                                 | --                         | --                              | --                                  |
| TOTAL | 3737                       | --                              | 57490                               | 344.30                     | --                              | 223.45                              | 1.47                       | --                              | 1.25                                |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

193784.77  
2192265.15

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME                                  | TEMPERATURE<br>(DEG C)<br>(00010)     | NUMBER OF<br>SAMPLING<br>POINTS<br>(000063) | INSTANTANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(000061) | BED<br>MAT.<br>FALL<br>DIAM.          | BED<br>MAT.<br>FALL<br>DIAM.          | BED<br>MAT.<br>FALL<br>DIAM.          |
|---------------|---------------------------------------|---------------------------------------|---------------------------------------------|------------------------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
|               |                                       |                                       |                                             |                                                      | % FINER<br>THAN<br>.062 MM<br>(80158) | % FINER<br>THAN<br>.125 MM<br>(80159) | % FINER<br>THAN<br>.250 MM<br>(80160) |
| JULY<br>24... | 1130                                  | 25.0                                  | 1                                           | 27                                                   | --                                    | 0                                     | 1                                     |
| AUG.<br>14... | 1130                                  | 27.0                                  | 1                                           | 5.5                                                  | 1                                     | 1                                     | 3                                     |
| DATE          | BED<br>MAT.<br>FALL<br>DIAM.          | BED<br>MAT.<br>FALL<br>DIAM.          | BED<br>MAT.<br>SIEVE<br>DIAM.               | BED<br>MAT.<br>SIEVE<br>DIAM.                        | BED<br>MAT.<br>SIEVE<br>DIAM.         | BED<br>MAT.<br>SIEVE<br>DIAM.         | BED<br>MAT.<br>SIEVE<br>DIAM.         |
|               | % FINER<br>THAN<br>.500 MM<br>(80161) | % FINER<br>THAN<br>1.00 MM<br>(80162) | % FINER<br>THAN<br>2.00 MM<br>(80169)       | % FINER<br>THAN<br>4.00 MM<br>(80170)                | % FINER<br>THAN<br>8.00 MM<br>(80171) | % FINER<br>THAN<br>16.0 MM<br>(80172) | % FINER<br>THAN<br>32.0 MM<br>(80173) |
| JULY<br>24... | 2                                     | 4                                     | 6                                           | 9                                                    | 15                                    | 23                                    | 75                                    |
| AUG.<br>14... | 6                                     | 14                                    | 22                                          | 30                                                   | 46                                    | 67                                    | 100                                   |

## CHEYENNE RIVER BASIN

23

06386500 CHEYENNE RIVER NEAR SPENCER, WYO.

LOCATION.--Lat 43°25', long 104°08', in N½ sec.25, T.40 N., R.61 W., Niobrara County, at gaging station at old highway bridge, 1.8 miles downstream from Robbers Roost Creek, 7.5 miles northeast of Spencer, and 30 miles south of Newcastle.

DRAINAGE AREA.--5,270 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: May 1969 to June 1970.

Sediment records: June 1951 to August 1954, November 1971 to September 1972.

Prior to October 1951, published as South Fork Cheyenne River near Spencer.

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C) | DIS-<br>CHARGE<br>(CFS) | SUS-<br>PENDED<br>SEDI-<br>MENT<br>(MG/L) | SUS-<br>PENDED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.004 MM | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.016 MM | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>1.00 MM |
|---------------|------|-----------------------------|-------------------------|-------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| NOV.<br>18... | 1220 | .0                          | 1.8                     | 35                                        | .17                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| FEB.<br>24... | 1640 | .5                          | 173                     | 2180                                      | 1020                                                         | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| MAR.<br>09... | 1500 | 9.5                         | 29                      | 402                                       | 31                                                           | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| MAR.<br>30... | 1150 | 6.0                         | 4.9                     | 52                                        | .69                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| MAY<br>05...  | 1120 | 19.0                        | 3.3                     | 45                                        | .40                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| MAY<br>17...  | 1510 | 23.5                        | 6.1                     | 80                                        | 1.3                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| JUNE<br>01... | 1430 | 32.0                        | 3.5                     | 60                                        | .57                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| JUNE<br>14... | 1715 | 22.5                        | 37                      | 14800                                     | 1480                                                         | 89                                                          | 98                                                          | 100                                                         | --                                                          | --                                                          | --                                                          | --                                                          |
| JUNE<br>29... | 1305 | 28.0                        | 22                      | 1730                                      | 103                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| JULY<br>12... | 1710 | 26.5                        | .57                     | 24                                        | .04                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| AUG.<br>24... | 1505 | 26.5                        | 9.9                     | 2300                                      | 61                                                           | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          | --                                                          |
| SEP.<br>07... | 1350 | 18.0                        | 57                      | 12900                                     | 1990                                                         | 82                                                          | 87                                                          | 91                                                          | 91                                                          | 92                                                          | 97                                                          | 100                                                         |

## PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)                                | DIS-<br>CHARGE<br>(CFS)                                    | NUMBER<br>OF<br>SAM-<br>PLING<br>POINTS                    | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM |
|---------------|------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------------|
| AUG.<br>24... | 1505 | 26.5                                                       | 9.9                                                        | 14                                                         | 3                                                          | 4                                                          | 10                                                         |
|               |      | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>1.00 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>2.00 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>4.00 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>8.00 MM | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>16.0 MM |
| AUG.<br>24... | 27   | 61                                                         | 77                                                         | 87                                                         | 94                                                         | 96                                                         | 98                                                         |

## 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 1972.

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE  | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | CAR-<br>BONATE<br>(CO3)<br>(MG/L)<br>(00445) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(03945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) |
|-------|------|------------------------------------|---------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|
| OCT.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 14... | 1430 | 14                                 | 9.5                                                     | 0                                                   | 430                                                         | 100                                                                | 360                                                   | 5.6                                                               | 149                                             | 0                                            | 1500                                                    | 470                                                          |
| NOV.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 18... | 0950 | 24                                 | 8.5                                                     | 10                                                  | 500                                                         | 110                                                                | 360                                                   | 4.4                                                               | 189                                             | 0                                            | 1500                                                    | 510                                                          |
| DEC.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 15... | 1305 | 12                                 | 11                                                      | 10                                                  | 550                                                         | 110                                                                | 300                                                   | 4.4                                                               | 250                                             | 0                                            | 1700                                                    | 400                                                          |
| JAN.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 20... | 1015 | 10                                 | 13                                                      | 0                                                   | 460                                                         | 140                                                                | 210                                                   | 3.8                                                               | 262                                             | 0                                            | 1500                                                    | 300                                                          |
| FEB.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 16... | 1640 | 18                                 | 12                                                      | 740                                                 | 480                                                         | 89                                                                 | 310                                                   | 3.3                                                               | 239                                             | 0                                            | 1400                                                    | 430                                                          |
| MAR.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 09... | 1200 | 438                                | 5.4                                                     | 110                                                 | 120                                                         | 38                                                                 | 100                                                   | 5.6                                                               | 104                                             | 0                                            | 510                                                     | 46                                                           |
| 30... | 0945 | 21                                 | 12                                                      | 220                                                 | 390                                                         | 170                                                                | 660                                                   | 7.7                                                               | 248                                             | 0                                            | 1900                                                    | 730                                                          |
| MAY   |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 05... | 0955 | 7.0                                | 5.1                                                     | 80                                                  | 410                                                         | 140                                                                | 660                                                   | 5.8                                                               | 217                                             | 0                                            | 1700                                                    | 770                                                          |
| JUNE  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 01... | 1250 | 5.5                                | 6.1                                                     | 50                                                  | 300                                                         | 190                                                                | 820                                                   | 9.3                                                               | 261                                             | 0                                            | 2200                                                    | 670                                                          |
| 29... | 0855 | 82                                 | 7.5                                                     | 20                                                  | 120                                                         | 33                                                                 | 150                                                   | 9.3                                                               | 103                                             | 0                                            | 580                                                     | 79                                                           |
| AUG.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 03... | 1215 | 34                                 | 6.9                                                     | 160                                                 | 340                                                         | 120                                                                | 430                                                   | 8.1                                                               | 124                                             | 0                                            | 1400                                                    | 530                                                          |
| 24... | 1135 | 17                                 | 4.4                                                     | 200                                                 | 320                                                         | 49                                                                 | 630                                                   | 9.1                                                               | 99                                              | 0                                            | 1100                                                    | 770                                                          |
| SEP.  |      |                                    |                                                         |                                                     |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                              |                                                         |                                                              |
| 20... | 1035 | 5.7                                | .1                                                      | 90                                                  | 440                                                         | 120                                                                | 470                                                   | 5.8                                                               | 92                                              | 0                                            | 1700                                                    | 600                                                          |

| DATE  | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRATE<br>(NO3)<br>(MG/L)<br>(71851) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|-------|-------------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 14... | .8                                                          | .1                                                      | 190                                                 | 2950                                                                      | 4.16                                                          | 116                                                         | 1500                                          | 1380                                                         | 4.1                                                | 3000                                                                  | 7.9                      | 9.0                                    |
| NOV.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 18... | .9                                                          | .4                                                      | 150                                                 | 3110                                                                      | 4.24                                                          | 202                                                         | 1700                                          | 1550                                                         | 3.8                                                | 3910                                                                  | 7.8                      | .0                                     |
| DEC.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 15... | 1.0                                                         | .8                                                      | 140                                                 | 3160                                                                      | 4.52                                                          | 108                                                         | 1800                                          | 1600                                                         | 3.1                                                | 3890                                                                  | 7.7                      | .5                                     |
| JAN.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 20... | .9                                                          | 1.6                                                     | 100                                                 | 2770                                                                      | 3.92                                                          | 77.8                                                        | 1700                                          | 1490                                                         | 2.2                                                | 3220                                                                  | 7.7                      | .0                                     |
| FEB.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 16... | .8                                                          | 2.2                                                     | 130                                                 | 2860                                                                      | 4.13                                                          | 148                                                         | 1600                                          | 1400                                                         | 3.4                                                | 3640                                                                  | 7.6                      | .0                                     |
| MAR.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 09... | .7                                                          | 2.5                                                     | 100                                                 | 875                                                                       | 1.21                                                          | 1050                                                        | 450                                           | 365                                                          | 2.0                                                | 1220                                                                  | 7.3                      | 1.5                                    |
| 30... | .9                                                          | .8                                                      | 330                                                 | 3950                                                                      | 5.59                                                          | 233                                                         | 1700                                          | 1500                                                         | 7.0                                                | 5200                                                                  | 8.0                      | 2.0                                    |
| MAY   |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 05... | .8                                                          | .0                                                      | 280                                                 | 3810                                                                      | 5.41                                                          | 75.2                                                        | 1600                                          | 1420                                                         | 7.2                                                | 5070                                                                  | 7.8                      | 19.0                                   |
| JUNE  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 01... | 1.6                                                         | .2                                                      | 540                                                 | 4330                                                                      | 6.23                                                          | 68.0                                                        | 1500                                          | 1290                                                         | 9.1                                                | 5500                                                                  | 7.9                      | 21.5                                   |
| 29... | .7                                                          | 1.8                                                     | 140                                                 | 1030                                                                      | 1.44                                                          | 235                                                         | 430                                           | 346                                                          | 3.1                                                | 1490                                                                  | 7.6                      | 18.0                                   |
| AUG.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 03... | .9                                                          | .4                                                      | 260                                                 | 2900                                                                      | 4.26                                                          | 287                                                         | 1300                                          | 1200                                                         | 5.1                                                | 4020                                                                  | 7.6                      | 14.0                                   |
| 24... | 1.0                                                         | 1.5                                                     | 220                                                 | 2930                                                                      | 4.08                                                          | 138                                                         | 1000                                          | 919                                                          | 8.7                                                | 4250                                                                  | 7.6                      | 18.0                                   |
| SEP.  |                                                             |                                                         |                                                     |                                                                           |                                                               |                                                             |                                               |                                                              |                                                    |                                                                       |                          |                                        |
| 20... | 1.1                                                         | .2                                                      | 240                                                 | 3380                                                                      | 4.92                                                          | 55.7                                                        | 1600                                          | 1500                                                         | 5.1                                                | 4410                                                                  | 7.5                      | 13.5                                   |

## CHEYENNE RIVER BASIN

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06395000 CHEYENNE RIVER AT EDMONT, S. DAK.

LOCATION.--Lat 43°18'20", long 103°49'14", in SW¼SE¼SE¼ 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 Burlington Northern Railroad bridge (corrected), and 600 ft upstream from Cottonwood Creek.

DRAINAGE AREA.--7,143 sq mi.

PERIOD OF RECORD.--Chemical analyses: July 1969 to September 1972.

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | CAR-<br>BONATE<br>(CO3)<br>(MG/L)<br>(00445) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) |
|---------------|------|------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCT.<br>20... | 1130 | 18                                 | 410                                                         | 120                                                      | 530                                                   | 6.4                                                               | 185                                             | 0                                            | 1700                                                    | 580                                                          | .2                                                          |
| NOV.<br>17... | 1130 | 29                                 | 410                                                         | 110                                                      | --                                                    | --                                                                | --                                              | --                                           | 1600                                                    | 510                                                          | --                                                          |
| DEC.<br>15... | 1100 | 7.0                                | 520                                                         | 160                                                      | --                                                    | --                                                                | --                                              | --                                           | 2100                                                    | 590                                                          | --                                                          |
| JAN.<br>11... | 1400 | 3.7                                | 550                                                         | 170                                                      | 530                                                   | 7.4                                                               | 325                                             | 0                                            | 2200                                                    | 570                                                          | .5                                                          |
| FEB.<br>15... | 1030 | 25                                 | 650                                                         | 220                                                      | --                                                    | --                                                                | --                                              | --                                           | 2400                                                    | 890                                                          | --                                                          |
| MAR.<br>14... | 1100 | 242                                | 160                                                         | 51                                                       | --                                                    | --                                                                | --                                              | --                                           | 730                                                     | 110                                                          | --                                                          |
| APR.<br>12... | 1100 | 30                                 | 410                                                         | 130                                                      | 560                                                   | 7.9                                                               | 209                                             | 0                                            | 1700                                                    | 600                                                          | .5                                                          |
| MAY<br>16...  | 1330 | 32                                 | 310                                                         | 180                                                      | --                                                    | --                                                                | --                                              | --                                           | 2400                                                    | 290                                                          | --                                                          |
| AUG.<br>24... | 1130 | 40                                 | 130                                                         | 42                                                       | 200                                                   | 8.6                                                               | 125                                             | 0                                            | 660                                                     | 97                                                           | .8                                                          |
| SEP.<br>12... | 0930 | 8.1                                | 260                                                         | 80                                                       | 380                                                   | 8.5                                                               | 148                                             | 0                                            | 1200                                                    | 330                                                          | .6                                                          |

| DATE          | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(RESI-<br>DUE AT<br>180 C)<br>(MG/L)<br>(70300) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|--------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>20... | .04                                                                      | 220                                                 | 3780                                                                        | 5.14                                                          | 184                                                         | 1500                                           | 1400                                                         | 5.9                                                | 4550                                                                  | 7.9                      | 8.5                                    |
| NOV.<br>17... | .14                                                                      | --                                                  | 3300                                                                        | 4.49                                                          | 266                                                         | --                                             | --                                                           | --                                                 | 4250                                                                  | 7.8                      | 2.5                                    |
| DEC.<br>15... | .05                                                                      | --                                                  | 3880                                                                        | 5.28                                                          | 73.6                                                        | 2000                                           | --                                                           | --                                                 | 5180                                                                  | 7.6                      | .0                                     |
| JAN.<br>11... | .14                                                                      | 260                                                 | 4280                                                                        | 5.82                                                          | 42.8                                                        | 2100                                           | 1800                                                         | 5.1                                                | 5130                                                                  | 7.6                      | .0                                     |
| FEB.<br>15... | .91                                                                      | --                                                  | 5440                                                                        | 7.40                                                          | 367                                                         | 2500                                           | --                                                           | --                                                 | 6510                                                                  | 7.6                      | .0                                     |
| MAR.<br>14... | .29                                                                      | --                                                  | 1330                                                                        | 1.81                                                          | 869                                                         | 610                                            | --                                                           | --                                                 | 1790                                                                  | 7.8                      | 5.0                                    |
| APR.<br>12... | .00                                                                      | 260                                                 | 3860                                                                        | 5.25                                                          | 315                                                         | 1600                                           | 1400                                                         | 6.2                                                | 4640                                                                  | 8.2                      | 14.5                                   |
| MAY<br>16...  | .03                                                                      | --                                                  | 4200                                                                        | 5.71                                                          | 366                                                         | 1500                                           | --                                                           | --                                                 | 4880                                                                  | 8.2                      | 27.0                                   |
| AUG.<br>24... | .54                                                                      | --                                                  | 1310                                                                        | 1.78                                                          | 141                                                         | 500                                            | 400                                                          | 3.9                                                | 1590                                                                  | 7.9                      | 20.5                                   |
| SEP.<br>12... | .13                                                                      | --                                                  | 2600                                                                        | 3.54                                                          | 56.9                                                        | 980                                            | 860                                                          | 5.3                                                | 3190                                                                  | 8.0                      | 16.5                                   |



## CHEYENNE RIVER BASIN

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00618) | DIS-<br>SOLVED<br>NITRITE<br>(N)<br>(MG/L)<br>(00613) | DIS-<br>SOLVED<br>AMMONIA<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00608) | ORGANIC<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00605) | TOTAL<br>KJEL-<br>DAHL<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00625) | TOTAL<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00600) | DIS-<br>SOLVED<br>ORTHO-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00671) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|------|------------------------------------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------|
| OCT.<br>20... | 1130 | 18                                 | --                                                    | --                                                    | .10                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 8.5                                    |
| NOV.<br>17... | 1130 | 29                                 | .14                                                   | .000                                                  | .53                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 2.5                                    |
| DEC.<br>15... | 1100 | 7.0                                | .05                                                   | .000                                                  | .09                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| JAN.<br>11... | 1400 | 3.7                                | --                                                    | --                                                    | .13                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| FEB.<br>15... | 1030 | 25                                 | .91                                                   | .000                                                  | 1.2                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| MAR.<br>14... | 1100 | 242                                | .29                                                   | .000                                                  | .31                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 5.0                                    |
| APR.<br>12... | 1100 | 30                                 | --                                                    | --                                                    | .07                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 14.5                                   |
| MAY<br>16...  | 1330 | 32                                 | .03                                                   | .000                                                  | .12                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 27.0                                   |
| AUG.<br>24... | 1130 | 40                                 | .54                                                   | .000                                                  | .15                                                                    | 4.1                                                  | 4.2                                                                 | 4.7                                                | --                                                                      | 20.5                                   |
| SEP.<br>12... | 0930 | 8.1                                | .13                                                   | .000                                                  | 1.3                                                                    | .20                                                  | 1.5                                                                 | 1.6                                                | --                                                                      | 16.5                                   |

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | CYANIDE<br>(CN)<br>(MG/L)<br>(00720) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BERYL-<br>LIUM<br>(BE)<br>(UG/L)<br>(01010) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|------------------------------------|---------------------------------------------------------------|--------------------------------------|--------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| OCT.<br>20... | 1130 | 18                                 | 180                                                           | .00                                  | 0                                                      | 0                                                             | 0                                                           | 1                                                            | 6                                                     |
| JAN.<br>11... | 1400 | 3.7                                | 360                                                           | .00                                  | 0                                                      | 0                                                             | 3                                                           | 0                                                            | 14                                                    |
| APR.<br>12... | 1100 | 30                                 | 70                                                            | .00                                  | 0                                                      | 0                                                             | 0                                                           | 0                                                            | 3                                                     |

| DATE          | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>SILVER<br>(AG)<br>(UG/L)<br>(01075) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|---------------|-----------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| OCT.<br>20... | 2                                                   | .1                                            | 2                                                              | 18                                                    | 4                                                            | 0                                                     | 2.3                                                         | 20                                                  |
| JAN.<br>11... | 10                                                  | .1                                            | 2                                                              | 7                                                     | 3                                                            | 1                                                     | 3.3                                                         | 420                                                 |
| APR.<br>12... | 0                                                   | .3                                            | 9                                                              | 5                                                     | 2                                                            | 0                                                     | 4.4                                                         | 20                                                  |

## CHEYENNE RIVER BASIN

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06395000 CHEYENNE RIVER AT EDMONT, S. DAK.--Continued  
 CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## PESTICIDES

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | ALDRIN<br>(UG/L)<br>(39330) | CHLOR-<br>DANE<br>(UG/L)<br>(39350) | DDD<br>(UG/L)<br>(39360) | DDE<br>(UG/L)<br>(39365) | DDT<br>(UG/L)<br>(39370) | DI-<br>ELDRIN<br>(UG/L)<br>(39380) |
|---------------|------|------------------------------------|-----------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|------------------------------------|
| OCT.<br>20... | 1130 | 18                                 | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |
| JAN.<br>11... | 1400 | 3.7                                | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |
| APR.<br>12... | 1100 | 30                                 | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |

| DATE          | ENDRIN<br>(UG/L)<br>(39390) | HEPTA-<br>CHLOR<br>(UG/L)<br>(39410) | HEPTA-<br>CHLOR<br>EPOXIDE<br>(UG/L)<br>(39420) | LINDANE<br>(UG/L)<br>(39340) | 2,4-D<br>(UG/L)<br>(39730) | 2,4,5-T<br>(UG/L)<br>(39740) | SILVEX<br>(UG/L)<br>(39760) |
|---------------|-----------------------------|--------------------------------------|-------------------------------------------------|------------------------------|----------------------------|------------------------------|-----------------------------|
| OCT.<br>20... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |
| JAN.<br>11... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |
| APR.<br>12... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |

## FIELD DETERMINATIONS

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>OXYGEN<br>(MG/L)<br>(00300) | BIO-<br>CHEM-<br>ICAL<br>OXYGEN<br>DEMAND<br>(MG/L)<br>(00310) | PH<br>(UNITS)<br>(00400) | IMME-<br>DIATE<br>COLI-<br>FORM<br>(COL.<br>PER<br>100 ML)<br>(31501) | FECAL<br>COLI-<br>FORM<br>(COL.<br>PER<br>100 ML)<br>(31616) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | AIR<br>TEMP-<br>ERATURE<br>(DEG C)<br>(00020) |
|---------------|------|------------------------------------|-----------------------------------------------|----------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------|-----------------------------------------------|
| OCT.<br>20... | 1130 | 18                                 | 10.8                                          | 1.5                                                            | 8.1                      | --                                                                    | 75                                                           | 8.5                                    | 13.5                                          |
| NOV.<br>17... | 1130 | 29                                 | 11.8                                          | 1.1                                                            | 8.4                      | --                                                                    | 3                                                            | 2.5                                    | 2.0                                           |
| DEC.<br>15... | 1100 | 7.0                                | 8.6                                           | 1.0                                                            | 8.0                      | --                                                                    | 4                                                            | .0                                     | -3.5                                          |
| JAN.<br>11... | 1400 | 3.7                                | 10.5                                          | .5                                                             | 7.7                      | --                                                                    | <1                                                           | .0                                     | .0                                            |
| FEB.<br>15... | 1030 | 25                                 | 12.3                                          | 2.0                                                            | 7.6                      | --                                                                    | 44                                                           | .0                                     | 5.0                                           |
| MAR.<br>14... | 1100 | 242                                | 11.4                                          | 2.2                                                            | 8.2                      | --                                                                    | 50                                                           | 5.0                                    | 8.0                                           |
| APR.<br>12... | 1100 | 30                                 | 8.7                                           | 1.1                                                            | 8.1                      | --                                                                    | 10                                                           | 14.5                                   | 14.0                                          |
| MAY<br>16...  | 1330 | 32                                 | 7.1                                           | .8                                                             | 7.9                      | --                                                                    | 4                                                            | 27.0                                   | 36.5                                          |
| AUG.<br>24... | 1130 | 40                                 | 7.4                                           | 1.4                                                            | 8.5                      | --                                                                    | --                                                           | 20.5                                   | 29.5                                          |
| SEP.<br>12... | 0930 | 8.1                                | 7.6                                           | 1.2                                                            | --                       | --                                                                    | 1190                                                         | 16.5                                   | 22.0                                          |

## CHEYENNE RIVER BASIN

06401500 CHEYENNE RIVER BELOW ANGOSTURA DAM, S. DAK.

LOCATION.--Lat 43°20'42", long 103°26'12", in NE¼NW¼ 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 1972.  
Water temperatures: October 1968 to September 1972.  
Sediment records: Water years 1958, 1960-63 (partial-record station).

EXTREMES.--1971-72:

Dissolved solids: Maximum, 1,680 mg/l Jan. 1-31; minimum, 1,450 mg/l Feb. 1-29.

Hardness: Maximum, 900 mg/l Jan. 1-31; minimum, 750 mg/l Feb. 1-29.

Specific conductance: Maximum daily, 2,400 micromhos Jan. 1; minimum, 1,750 micromhos Mar. 4, June 21-25.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1.3                                        | 18                                                      | 220                                                         | 65                                                          | 170                                                   | 13                                                         | 180                                             | 900                                                     | 100                                                          | .5                                                          | .45                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 1.3                                        | 19                                                      | 230                                                         | 67                                                          | 180                                                   | 17                                                         | 211                                             | 930                                                     | 120                                                          | .5                                                          | .57                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1.3                                        | 19                                                      | 220                                                         | 66                                                          | 170                                                   | 13                                                         | 150                                             | 920                                                     | 120                                                          | .4                                                          | .80                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1.1                                        | 15                                                      | 240                                                         | 72                                                          | 180                                                   | 12                                                         | 200                                             | 950                                                     | 110                                                          | .7                                                          | .71                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 1.1                                        | 13                                                      | 190                                                         | 67                                                          | 160                                                   | 11                                                         | 144                                             | 840                                                     | 93                                                           | .4                                                          | .56                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1.7                                        | 13                                                      | 210                                                         | 64                                                          | 160                                                   | 12                                                         | 171                                             | 860                                                     | 98                                                           | .7                                                          | .36                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 2.0                                        | 15                                                      | 220                                                         | 65                                                          | 160                                                   | 13                                                         | 147                                             | 880                                                     | 100                                                          | .7                                                          | .22                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 2.4                                        | 17                                                      | 220                                                         | 65                                                          | 160                                                   | 13                                                         | 153                                             | 900                                                     | 100                                                          | .6                                                          | .18                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 25                                         | 14                                                      | 210                                                         | 65                                                          | 150                                                   | 12                                                         | 157                                             | 870                                                     | 97                                                           | .7                                                          | .19                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 2.7                                        | 15                                                      | 210                                                         | 63                                                          | 160                                                   | 12                                                         | 163                                             | 870                                                     | 100                                                          | .6                                                          | .28                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1.3                                        | 19                                                      | 210                                                         | 67                                                          | 160                                                   | 14                                                         | 158                                             | 910                                                     | 100                                                          | .6                                                          | .25                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 1.0                                        | 20                                                      | 210                                                         | 67                                                          | 170                                                   | 14                                                         | 173                                             | 910                                                     | 100                                                          | 1.3                                                         | .36                                                                      |
| WTD. AVG.           | --   | --                                         | 15                                                      | 213                                                         | 65                                                          | 156                                                   | 12                                                         | 161                                             | 880                                                     | 99                                                           | .7                                                          | .27                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                             |                                                       |                                                            |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | 3.5                                        | 16                                                      | 216                                                         | 66                                                          | 165                                                   | 13                                                         | 167                                             | 895                                                     | 103                                                          | .6                                                          | .41                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 52                                                      | 733                                                         | 225                                                         | 538                                                   | 43                                                         | 554                                             | 3030                                                    | 343                                                          | 2.3                                                         | .94                                                                      |

## ANALYSES OF ADDITIONAL SAMPLES

|       |       |     |     |     |    |     |     |     |     |    |    |     |
|-------|-------|-----|-----|-----|----|-----|-----|-----|-----|----|----|-----|
| JAN.  |       |     |     |     |    |     |     |     |     |    |    |     |
| 11... | A1530 | .89 | 11  | 190 | 68 | 150 | 10  | 198 | 830 | 86 | .4 | .27 |
| APR.  |       |     |     |     |    |     |     |     |     |    |    |     |
| 26... | A1300 | 1.7 | 7.1 | 180 | 54 | 150 | 8.6 | 164 | 750 | 81 | .7 | .13 |
| AUG.  |       |     |     |     |    |     |     |     |     |    |    |     |
| 16... | A1050 | 1.3 | 7.7 | 190 | 66 | 160 | 9.8 | 167 | 850 | 99 | .8 | .13 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.  
A Discharge at time of sampling.

## CHEYENNE RIVER BASIN

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

## EXTREMES.--Continued

Water temperatures: Maximum, 25.0°C July 30, Aug. 25; minimum, freezing point Dec. 14-15, Feb. 2-7.

## Period of record:

Dissolved solids (1968-69, 1971-72): Maximum, 1,770 mg/l Mar. 1 to Apr. 30, 1969; minimum, 1,450 mg/l Feb. 1-29, 1972.

Hardness (1968-69, 1971-72): Maximum, 900 mg/l Jan. 1-31, 1972; minimum, 750 mg/l Feb. 1-29, 1972.

Specific conductance (1968-70, 1971-72): Maximum daily, 2,400 micromhos Jan. 1, 1972; minimum daily, 1,750 micromhos Mar. 4, June 21-25, 1972.

Water temperatures (1968-70, 1971-72): Maximum, 30.0°C on several days during June to July 1970; minimum, freezing point Dec. 28, 29, 1968, Mar. 8, 1969, Dec. 14, 15, 1971, Feb. 2-7, 1972.

REMARKS.--Daily samples for chemical analysis composited by discharge. Minimum observed during water year: Dissolved solids, 1,310 mg/l Apr. 26; hardness, 670 mg/l Apr. 26. Additional samples collected for more comprehensive definition of water quality.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE             | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORON (B) (UG/L) (01020) | DIS-SOLVED SOLIDS (SUM OF TENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM ADSORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICROMHOS) (00095) | PH (UNITS) (03400) | TEMPERATURE (DEG C) (00010) |
|------------------|------------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|------------------------------------------|--------------------|-----------------------------|
| OCT.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | --                                       | .030                                | 130                                 | 1580                                            | 2.15                                       | 5.55                                     | 820                              | 670                                   | 2.6                             | 2090                                     | 7.9                | --                          |
| NOV.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-30            | --                                       | --                                  | 120                                 | 1670                                            | 2.27                                       | 5.86                                     | 850                              | 680                                   | 2.7                             | 2180                                     | 7.9                | --                          |
| DEC.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | .010                                     | .010                                | 40                                  | 1610                                            | 2.19                                       | 5.65                                     | 820                              | 700                                   | 2.6                             | 2120                                     | 7.9                | --                          |
| JAN.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | .040                                     | .040                                | 130                                 | 1680                                            | 2.28                                       | 4.99                                     | 900                              | 730                                   | 2.6                             | 2050                                     | 7.9                | --                          |
| FEB.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-29            | .050                                     | .060                                | 150                                 | 1450                                            | 1.97                                       | 4.31                                     | 750                              | 630                                   | 2.5                             | 1970                                     | 7.8                | --                          |
| MAR.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | .020                                     | .030                                | 140                                 | 1500                                            | 2.04                                       | 6.88                                     | 790                              | 650                                   | 2.5                             | 2020                                     | 7.9                | --                          |
| APR.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-30            | .030                                     | .030                                | 130                                 | 1530                                            | 2.08                                       | 8.26                                     | 820                              | 700                                   | 2.4                             | 2060                                     | 8.0                | --                          |
| MAY              |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | .030                                     | .030                                | 140                                 | 1550                                            | 2.11                                       | 10.0                                     | 820                              | 690                                   | 2.4                             | 2090                                     | 8.0                | --                          |
| JUNE             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-30            | .020                                     | .020                                | 150                                 | 1500                                            | 2.04                                       | 101                                      | 790                              | 660                                   | 2.3                             | 2020                                     | 7.9                | --                          |
| JULY             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | .010                                     | .010                                | 150                                 | 1510                                            | 2.05                                       | 11.0                                     | 780                              | 650                                   | 2.5                             | 2010                                     | 8.1                | --                          |
| AUG.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-31            | .030                                     | .030                                | 150                                 | 1560                                            | 2.12                                       | 5.48                                     | 800                              | 670                                   | 2.5                             | 2080                                     | 8.3                | --                          |
| SEP.             |                                          |                                     |                                     |                                                 |                                            |                                          |                                  |                                       |                                 |                                          |                    |                             |
| 01-30            | .010                                     | .020                                | 150                                 | 1580                                            | 2.15                                       | 4.27                                     | 800                              | 660                                   | 2.6                             | 1890                                     | 8.1                | --                          |
| WTD. AVG.        | B.022                                    | C.022                               | 143                                 | 1520                                            | 2.07                                       | --                                       | 799                              | 666                                   | 2.4                             | 2030                                     | 7.9                | --                          |
| TIME WTD. AVG.   | B.025                                    | C.026                               | 132                                 | 1560                                            | 2.12                                       | --                                       | 812                              | 674                                   | 2.5                             | 2050                                     | 8.0                | --                          |
| TOT. LOAD (TONS) | B.070                                    | C.071                               | 0                                   | 5250                                            | --                                         | --                                       | --                               | --                                    | --                              | --                                       | --                 | --                          |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |      |     |      |      |      |     |     |     |      |     |      |
|-------|------|------|-----|------|------|------|-----|-----|-----|------|-----|------|
| JAN.  |      |      |     |      |      |      |     |     |     |      |     |      |
| 11... | --   | .010 | 140 | 1440 | 1.96 | 3.46 | 750 | 590 | 2.4 | 1940 | 7.9 | 2.5  |
| APR.  |      |      |     |      |      |      |     |     |     |      |     |      |
| 26... | .020 | .030 | 160 | 1310 | 1.78 | 6.12 | 670 | 540 | 2.5 | 1800 | 8.0 | 9.5  |
| AUG.  |      |      |     |      |      |      |     |     |     |      |     |      |
| 16... | .070 | --   | 170 | 1470 | 2.00 | 5.16 | 750 | 610 | 2.6 | 1970 | 7.9 | 23.0 |

B Based on 305 days of chemical analysis.

C Based on 336 days of chemical analysis.



## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN   | FEB  | MAR  | APR   | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|------|------|-------|------|------|-------|------|------|------|------|------|
| 1   | 2070 | 2140 | 2080 | 2400  | 1850 | 1850 | 2000  | 1950 | 2000 | 2040 | 2170 | 2150 |
| 2   | 2080 | 2140 | 2100 | 2370  | 1900 | 1850 | 2050  | 2000 | 1900 | 2060 | 2170 | 2160 |
| 3   | 2080 | 2160 | 2130 | 2350  | 1900 | 1850 | 2050  | 2000 | 1900 | 2060 | 2170 | 2140 |
| 4   | 2180 | 2100 | 2180 | 2380  | 1950 | 1750 | 2050  | 2000 | 1900 | 2040 | 2170 | 2140 |
| 5   | 2160 | 2100 | 2200 | 2330  | 1950 | 1850 | 2050  | 1950 | 1900 | 2040 | 2170 | 2120 |
| 6   | 2160 | 2120 | 2180 | 2310  | 1950 | 1850 | 1950  | 1950 | 1900 | 2040 | 2170 | 2120 |
| 7   | 2130 | 2100 | 2130 | 2300  | 1950 | 1900 | ---   | 1950 | 1900 | 2040 | 2180 | 2120 |
| 8   | 2160 | 2120 | 2190 | 2310  | 1910 | 1950 | 1950  | 1950 | 2000 | 2120 | 2180 | 2130 |
| 9   | 2080 | 2170 | 2070 | 2300  | 1910 | 1900 | 1950  | 2000 | 2000 | 2080 | 2180 | 2110 |
| 10  | 2020 | 2170 | 2230 | ---   | 1910 | 1950 | 2050  | 2000 | 2000 | 2120 | 2180 | 2120 |
| 11  | 2080 | 2180 | 2230 | 2300  | 1900 | 1900 | 2050  | 2000 | 2000 | 2140 | 2190 | 2130 |
| 12  | 2120 | 2170 | 2250 | 2300  | 1910 | 1900 | ---   | 2000 | 2050 | 2130 | 2190 | 2120 |
| 13  | 2140 | 2160 | 2240 | 2000  | 1900 | 1950 | 2050  | 1950 | 2000 | 2120 | 2190 | 2110 |
| 14  | 2030 | 2150 | 2250 | 2050  | 1910 | 2000 | 2050  | 2000 | 1800 | 2080 | 2190 | 2140 |
| 15  | 2020 | 2150 | 2210 | 2000  | 1920 | 2000 | 2050  | 1950 | 1850 | 2080 | 2180 | 2130 |
| 16  | 2050 | 2140 | 2150 | 2000  | 1930 | 1950 | 2050  | 1950 | 1850 | 2080 | 2180 | 2140 |
| 17  | 2050 | 2160 | 2020 | 2000  | 1910 | 2050 | 2050  | 2000 | 1850 | 2080 | 2180 | 2130 |
| 18  | 2070 | 2120 | 2080 | 2050  | 1920 | 2050 | 2050  | 2000 | 1850 | 2080 | 2160 | 2150 |
| 19  | 2180 | 2120 | 2080 | 2300  | 1910 | 2050 | 2050  | 2000 | 1850 | 2080 | 2160 | 2130 |
| 20  | 2130 | 2120 | 2180 | 2300  | 1870 | 2050 | 2100  | 1950 | 1850 | 2110 | 2160 | 2140 |
| 21  | 2110 | 2130 | 2140 | 2300  | 1880 | 1950 | 1850  | 1950 | 1750 | 2160 | 2180 | 2150 |
| 22  | 2110 | 2180 | 2270 | 2250  | 1880 | 1950 | 1850  | 1950 | 1750 | 2160 | 2180 | 2150 |
| 23  | 2090 | 2180 | 2260 | ---   | 1880 | 1950 | 1800  | 1950 | 1750 | 2150 | 2180 | 2140 |
| 24  | 2120 | 2180 | 2260 | 2300  | 1900 | 1950 | 1850  | 1950 | 1750 | 2140 | 2180 | 2140 |
| 25  | 2120 | 2180 | 2240 | 2150  | 1900 | 1900 | 1800  | 1950 | 1750 | 2130 | 2180 | 2150 |
| 26  | 2110 | 2180 | 2200 | 2150  | 1900 | 1950 | 1800  | 1950 | 1850 | 2130 | 2140 | 2140 |
| 27  | 2070 | 2160 | 2200 | 2150  | 1900 | 1950 | 1900  | 2000 | 1850 | 2130 | 2140 | 2150 |
| 28  | 2060 | 2150 | 2240 | 2100  | 1900 | 1950 | ---   | 2000 | 1850 | 2130 | 2140 | 2120 |
| 29  | 2060 | 2140 | 2290 | 2100  | 1900 | 2050 | ---   | 2000 | 1850 | 2120 | 2140 | 2120 |
| 30  | 2060 | 2070 | 2230 | 2100  | ---  | 2050 | ---   | 2000 | 1850 | 2130 | 2140 | 2120 |
| 31  | 2060 | ---  | 2240 | 2050  | ---  | 2050 | ---   | 2000 | ---  | 2140 | 2140 | ---  |
| AVG | 2100 | 2140 | 2190 | D2210 | 1910 | 1950 | E1980 | 1980 | 1880 | 2100 | 2170 | 2130 |

D Based on 29 days of data.

E Based on 25 days of data.

## CHEYENNE RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV | DEC | JAN | FEB | MAR  | APR   | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|-----|-----|-----|-----|------|-------|------|------|------|------|------|
| 1   | 7.0  | 5.0 | 3.0 | 3.0 | 1.0 | 5.0  | 5.0   | 9.0  | 18.0 | 22.0 | 22.0 | 14.0 |
| 2   | 5.0  | 5.0 | 2.0 | 3.0 | 0.0 | 5.0  | 6.0   | 11.0 | 18.0 | 22.0 | 22.0 | 14.0 |
| 3   | 7.0  | 6.0 | 3.0 | 2.0 | 0.0 | 6.0  | 7.0   | 11.0 | 18.0 | 20.0 | 21.0 | 15.0 |
| 4   | 12.0 | 7.0 | 3.0 | 2.0 | 0.0 | 8.0  | 7.0   | 12.0 | 19.0 | 18.0 | 21.0 | 15.0 |
| 5   | 13.0 | 8.0 | 2.0 | 3.0 | 0.0 | 9.0  | 8.0   | 13.0 | 19.0 | 20.0 | 22.0 | 15.0 |
| 6   | 14.0 | 8.0 | 2.0 | 3.0 | 0.0 | 10.0 | 9.0   | 13.0 | 19.0 | 20.0 | 22.0 | 15.0 |
| 7   | 13.0 | 7.0 | 1.0 | 2.0 | 0.0 | 10.0 | 9.0   | 13.0 | 20.0 | 20.0 | 22.0 | 14.0 |
| 8   | 13.0 | 7.0 | 2.0 | 3.0 | 1.0 | 10.0 | 10.0  | 13.0 | 20.0 | 20.0 | 22.0 | 14.0 |
| 9   | 13.0 | 8.0 | 3.0 | 2.0 | 1.0 | 10.0 | 11.0  | 15.0 | 20.0 | 20.0 | 22.0 | 15.0 |
| 10  | 14.0 | 8.0 | 3.0 | 2.0 | 2.0 | 9.0  | 11.0  | 15.0 | 20.0 | 20.0 | 23.0 | 16.0 |
| 11  | 15.0 | 8.0 | 3.0 | 3.0 | 2.0 | 9.0  | 11.0  | 17.0 | 19.0 | 20.0 | 23.0 | 16.0 |
| 12  | 14.0 | 6.0 | 2.0 | 2.0 | 2.0 | 9.0  | 11.0  | 18.0 | 18.0 | 19.0 | 23.0 | 16.0 |
| 13  | 13.0 | 6.0 | 1.0 | 2.0 | 3.0 | 9.0  | 11.0  | 18.0 | 17.0 | 19.0 | 24.0 | 16.0 |
| 14  | 12.0 | 5.0 | 0.0 | 1.0 | 2.0 | 9.0  | 11.0  | 18.0 | 18.0 | 19.0 | 24.0 | 16.0 |
| 15  | 12.0 | 4.0 | 0.0 | 1.0 | 3.0 | 10.0 | 12.0  | 18.0 | 17.0 | 19.0 | 24.0 | 16.0 |
| 16  | 11.0 | 4.0 | 2.0 | 2.0 | 2.0 | 10.0 | 12.0  | 18.0 | 16.0 | 19.0 | 24.0 | 17.0 |
| 17  | 10.0 | 3.0 | 2.0 | 3.0 | 2.0 | 10.0 | 12.0  | 18.0 | 17.0 | 19.0 | 24.0 | 17.0 |
| 18  | 9.0  | 4.0 | 3.0 | 4.0 | 2.0 | 10.0 | 12.0  | 18.0 | 16.0 | 18.0 | 23.0 | 18.0 |
| 19  | 9.0  | 4.0 | 2.0 | 3.0 | 2.0 | 10.0 | 13.0  | 16.0 | 15.0 | 18.0 | 23.0 | 18.0 |
| 20  | 10.0 | 4.0 | 2.0 | 3.0 | 3.0 | 10.0 | 13.0  | 17.0 | 14.0 | 19.0 | 24.0 | 18.0 |
| 21  | 13.0 | 4.0 | 3.0 | 3.0 | 4.0 | 10.0 | 12.0  | 18.0 | 16.0 | 19.0 | 24.0 | 18.0 |
| 22  | 12.0 | 5.0 | 4.0 | 2.0 | 4.0 | 10.0 | 12.0  | 18.0 | 19.0 | 20.0 | 23.0 | 18.0 |
| 23  | 13.0 | 7.0 | 3.0 | 2.0 | 5.0 | 10.0 | 12.0  | 17.0 | 20.0 | 19.0 | 24.0 | 18.0 |
| 24  | 12.0 | 7.0 | 4.0 | 1.0 | 4.0 | 10.0 | 12.0  | 18.0 | 20.0 | 20.0 | 24.0 | 18.0 |
| 25  | 13.0 | 7.0 | 3.0 | 1.0 | 4.0 | 8.0  | 11.0  | 18.0 | 14.0 | 20.0 | 25.0 | 18.0 |
| 26  | 13.0 | 5.0 | 3.0 | 1.0 | 3.0 | 7.0  | 9.0   | 18.0 | 20.0 | 20.0 | 23.0 | 16.0 |
| 27  | 9.0  | 3.0 | 3.0 | 1.0 | 4.0 | 6.0  | 7.0   | 17.0 | 20.0 | 20.0 | 22.0 | 16.0 |
| 28  | 10.0 | 2.0 | 2.0 | 1.0 | 3.0 | 5.0  | ---   | 17.0 | 21.0 | 20.0 | 20.0 | 15.0 |
| 29  | 5.0  | 2.0 | 3.0 | 1.0 | 3.0 | 5.0  | ---   | 17.0 | 22.0 | 23.0 | 18.0 | 14.0 |
| 30  | 5.0  | 3.0 | 3.0 | 1.0 | --- | 6.0  | ---   | 17.0 | 22.0 | 25.0 | 15.0 | 13.0 |
| 31  | 5.0  | --- | 3.0 | 1.0 | --- | 5.0  | ---   | 18.0 | ---  | 20.0 | 13.0 | ---  |
| AVG | 11.0 | 5.5 | 2.5 | 2.0 | 2.0 | 8.5  | F10.0 | 16.0 | 18.5 | 20.0 | 22.0 | 16.0 |

F Based on 27 days of data.

## CHEYENNE RIVER BASIN

06402600 CHEYENNE RIVER NEAR BUFFALO GAP, S. DAK.

LOCATION.--Lat 43°30'05", long 103°04'23", in SW¼NE¼ 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 1972.

Water temperatures: October 1968 to September 1972.

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 1,930 mg/l Dec. 1-31; minimum, 1,540 mg/l Jan. 1-31.

Hardness: Maximum, 990 mg/l Nov. 1 to Dec. 31; minimum, 640 mg/l Jan. 1-31.

Specific conductance: Maximum daily, 2,650 micromhos Dec. 10; minimum daily, 1,930 micromhos Apr. 23-28, May 3.

Water temperatures: Maximum, 28.0°C July 20-21, Aug. 12-13, 20-22; minimum, freezing point Dec. 8, Jan. 13-17, 23-27.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRATE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 78                                         | 13                                                      | 250                                                         | 76                                                                 | 200                                                   | 15                                                                | 212                                             | 1000                                                    | 100                                                          | .6                                                          | .92                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 74                                         | 14                                                      | 260                                                         | 83                                                                 | 190                                                   | 15                                                                | 221                                             | 1100                                                    | 110                                                          | .5                                                          | 1.3                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 74                                         | 15                                                      | 260                                                         | 82                                                                 | 210                                                   | 15                                                                | 241                                             | 1100                                                    | 120                                                          | .5                                                          | 1.6                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 55                                         | 14                                                      | 130                                                         | 77                                                                 | 180                                                   | 14                                                                | 240                                             | 1000                                                    | 2.7                                                          | .6                                                          | 1.8                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 59                                         | 13                                                      | 240                                                         | 70                                                                 | 160                                                   | 13                                                                | 159                                             | 970                                                     | 100                                                          | .4                                                          | 1.5                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 57                                         | 7.3                                                     | 230                                                         | 73                                                                 | 180                                                   | 13                                                                | 168                                             | 990                                                     | 100                                                          | .6                                                          | .49                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 66                                         | 8.3                                                     | 220                                                         | 71                                                                 | 170                                                   | 14                                                                | 168                                             | 940                                                     | 120                                                          | .7                                                          | .38                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 65                                         | 8.4                                                     | 220                                                         | 72                                                                 | 180                                                   | 12                                                                | 180                                             | 960                                                     | 110                                                          | .7                                                          | .65                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 125                                        | 16                                                      | 250                                                         | 74                                                                 | 180                                                   | 15                                                                | 214                                             | 1000                                                    | 100                                                          | .7                                                          | .84                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 59                                         | 11                                                      | 220                                                         | 66                                                                 | 180                                                   | 13                                                                | 190                                             | 950                                                     | 110                                                          | .6                                                          | .37                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 74                                         | 12                                                      | 230                                                         | 75                                                                 | 180                                                   | 15                                                                | 183                                             | 990                                                     | 110                                                          | .6                                                          | .54                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 75                                         | 11                                                      | 230                                                         | 76                                                                 | 190                                                   | 16                                                                | 196                                             | 1000                                                    | 110                                                          | .7                                                          | .66                                                                      |
| WTD. AVG.           | --   | --                                         | 12                                                      | 232                                                         | 75                                                                 | 184                                                   | 14                                                                | 200                                             | 1000                                                    | 101                                                          | .6                                                          | .91                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | 72                                         | 12                                                      | 228                                                         | 75                                                                 | 183                                                   | 14                                                                | 198                                             | 1000                                                    | 99                                                           | .6                                                          | .92                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 869                                                     | 16400                                                       | 5300                                                               | 13000                                                 | 1010                                                              | 14100                                           | 71000                                                   | 7150                                                         | 43                                                          | 65                                                                       |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |     |     |     |    |     |    |     |     |     |    |     |
|-------|------|-----|-----|-----|----|-----|----|-----|-----|-----|----|-----|
| JAN.  |      |     |     |     |    |     |    |     |     |     |    |     |
| 10... | 1200 | A62 | 14  | 250 | 73 | 170 | 14 | 255 | 930 | 110 | .5 | 1.5 |
| APR.  |      |     |     |     |    |     |    |     |     |     |    |     |
| 26... | 1015 | A94 | 7.6 | 200 | 61 | 170 | 12 | 180 | 830 | 94  | .7 | .29 |
| AUG.  |      |     |     |     |    |     |    |     |     |     |    |     |
| 16... | 1500 | A68 | 11  | 210 | 70 | 190 | 13 | 161 | 960 | 110 | .6 | .33 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.  
A Discharge at time of sampling.

## CHEYENNE RIVER BASIN

33

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1968-69, 1970-72): Maximum, 1,930 mg/l May 1-23, Dec. 1-31, 1971; minimum, 1,120 mg/l June 1-8, 1971.

Hardness (1968-69, 1970-72): 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. Minimum observed during water year: Dissolved solids, 1,470 mg/l Apr. 26. Additional samples collected for more comprehensive definition of water quality.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                           | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORDON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|--------------------------------|---------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| DEC.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | --                                                                  | .030                                                 | 320                                                  | 1760                                                                      | 2.39                                                          | 371                                                         | 940                                            | 760                                                          | 2.8                                                | 2350                                                                  | 7.9                      | --                                     |
| NOV.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30                          | --                                                                  | .050                                                 | 280                                                  | 1890                                                                      | 2.57                                                          | 378                                                         | 990                                            | 810                                                          | 2.6                                                | 2350                                                                  | 7.7                      | --                                     |
| DEC.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | .020                                                                | .060                                                 | 260                                                  | 1930                                                                      | 2.62                                                          | 386                                                         | 990                                            | 790                                                          | 2.9                                                | 2460                                                                  | 7.7                      | --                                     |
| JAN.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | .010                                                                | .050                                                 | 260                                                  | 1540                                                                      | 2.09                                                          | 229                                                         | 640                                            | 440                                                          | 3.1                                                | 2310                                                                  | 7.8                      | --                                     |
| FEB.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-29                          | .050                                                                | .060                                                 | 260                                                  | 1650                                                                      | 2.24                                                          | 263                                                         | 890                                            | 760                                                          | 2.3                                                | 2120                                                                  | 7.8                      | --                                     |
| MAR.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | .000                                                                | .020                                                 | 290                                                  | 1680                                                                      | 2.28                                                          | 259                                                         | 870                                            | 740                                                          | 2.6                                                | 2210                                                                  | 7.9                      | --                                     |
| APR.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30                          | .010                                                                | .030                                                 | 280                                                  | 1630                                                                      | 2.22                                                          | 290                                                         | 840                                            | 700                                                          | 2.6                                                | 2180                                                                  | 8.1                      | --                                     |
| MAY                            |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | .040                                                                | .040                                                 | 380                                                  | 1660                                                                      | 2.26                                                          | 291                                                         | 850                                            | 700                                                          | 2.7                                                | 2210                                                                  | 8.0                      | --                                     |
| JUNE                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30                          | .050                                                                | .050                                                 | 340                                                  | 1750                                                                      | 2.38                                                          | 591                                                         | 930                                            | 750                                                          | 2.6                                                | 2320                                                                  | 7.8                      | --                                     |
| JULY                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | .010                                                                | .010                                                 | 300                                                  | 1650                                                                      | 2.24                                                          | 263                                                         | 820                                            | 660                                                          | 2.7                                                | 2120                                                                  | 8.1                      | --                                     |
| AUG.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31                          | .020                                                                | .020                                                 | 310                                                  | 1710                                                                      | 2.33                                                          | 342                                                         | 880                                            | 730                                                          | 2.6                                                | 2200                                                                  | 8.0                      | --                                     |
| SEP.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30                          | .020                                                                | .030                                                 | 290                                                  | 1730                                                                      | 2.35                                                          | 350                                                         | 890                                            | 730                                                          | 2.8                                                | 2240                                                                  | 8.0                      | --                                     |
| WTD. AVG.                      | B.026                                                               | .039                                                 | 301                                                  | 1730                                                                      | 2.35                                                          | --                                                          | 887                                            | 722                                                          | 2.7                                                | 2270                                                                  | 7.9                      | --                                     |
| TIME WTD.                      |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| AVG.                           | B.023                                                               | .038                                                 | 298                                                  | 1710                                                                      | 2.33                                                          | --                                                          | 877                                            | 714                                                          | 2.7                                                | 2260                                                                  | 7.9                      | --                                     |
| TOT. LOAD<br>(TONS)            | B1.5                                                                | 2.7                                                  | 21                                                   | 122000                                                                    | --                                                            | --                                                          | --                                             | --                                                           | --                                                 | --                                                                    | --                       | --                                     |
| ANALYSES OF ADDITIONAL SAMPLES |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| JAN.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 10...                          | --                                                                  | .020                                                 | 270                                                  | 1690                                                                      | 2.30                                                          | 283                                                         | 920                                            | 720                                                          | 2.4                                                | 2190                                                                  | 7.8                      | .0                                     |
| APR.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 26...                          | .020                                                                | .080                                                 | 240                                                  | 1470                                                                      | 2.00                                                          | 376                                                         | 750                                            | 600                                                          | 2.7                                                | 1960                                                                  | 7.9                      | 8.5                                    |
| AUG.                           |                                                                     |                                                      |                                                      |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 16...                          | 1.3                                                                 | .050                                                 | 320                                                  | 1650                                                                      | 2.24                                                          | 304                                                         | 810                                            | 680                                                          | 2.9                                                | 2190                                                                  | 7.9                      | 31.5                                   |

B Based on 305 days of chemical analysis.

## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV   | DEC  | JAN  | FEB  | MAR  | APR  | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|-------|------|------|------|------|------|------|------|------|------|------|
| 1   | 2330 | 2260  | 2350 | 2380 | 2280 | 2040 | 2170 | 2010 | 2100 | 2230 | 2230 | 2270 |
| 2   | 2280 | 2260  | 2370 | 2400 | 2270 | 2030 | 2170 | 2000 | 2100 | 2220 | 2220 | 2270 |
| 3   | 2280 | 2240  | 2380 | 2400 | 2150 | 2040 | 2180 | 1930 | 2180 | 2230 | 2220 | 2280 |
| 4   | 2320 | 2250  | 2370 | 2400 | 2150 | 2050 | 2180 | 2000 | 2220 | 2240 | 2220 | 2270 |
| 5   | 2290 | 2250  | 2430 | 2400 | 2150 | 2050 | 2180 | 2000 | 2190 | 2240 | 2230 | 2260 |
| 6   | 2360 | 2250  | 2400 | 2400 | 2150 | 2050 | 2180 | 2170 | 2190 | 2240 | 2270 | 2260 |
| 7   | 2360 | 2250  | 2400 | 2400 | 2120 | 2050 | 2180 | 2160 | 2180 | 2240 | 2320 | 2300 |
| 8   | 2350 | 2250  | 2450 | 2400 | 2150 | 2050 | 2220 | 2160 | 2200 | 2250 | 2300 | 2320 |
| 9   | 2410 | 2250  | 2620 | 2400 | 2070 | 2260 | 2210 | 2160 | 2200 | 2230 | 2290 | 2280 |
| 10  | 2390 | 2250  | 2650 | 2400 | 2060 | 2250 | 2220 | 2130 | 2170 | 2220 | 2280 | 2290 |
| 11  | 2390 | 2270  | 2450 | 2330 | 2070 | 2250 | 2220 | 2150 | 2380 | 2220 | 2340 | 2310 |
| 12  | 2420 | 2250  | 2500 | 2340 | 2070 | 2250 | 2220 | 2170 | 2420 | 2220 | 2340 | 2340 |
| 13  | 2400 | 2260  | 2490 | 2340 | 2060 | 2250 | 2220 | 2160 | 2330 | 2220 | 2340 | 2280 |
| 14  | 2380 | 2270  | 2490 | 2340 | 2070 | 2260 | 2150 | 2160 | 2390 | 2220 | 2340 | 2280 |
| 15  | 2380 | 2270  | 2530 | 2330 | 2060 | 2260 | 2150 | 2120 | 2310 | 2220 | 2330 | 2280 |
| 16  | 2410 | 2270  | 2370 | 2330 | 2060 | 2320 | 2140 | 2160 | 2310 | 2180 | 2330 | 2280 |
| 17  | 2410 | 2270  | 2380 | 2330 | 2070 | 2320 | 2140 | 2160 | 2280 | 2180 | 2320 | 2290 |
| 18  | 2390 | 2270  | 2400 | 2450 | 2080 | 2300 | 2130 | 2080 | 2280 | 2180 | 2320 | 2280 |
| 19  | 2360 | 2280  | 2300 | 2460 | 2070 | 2310 | 2120 | 2150 | 2280 | 2180 | 2310 | 2280 |
| 20  | 2380 | 2280  | 2300 | 2450 | 2070 | 2310 | 2140 | 2150 | 2280 | 2220 | 2270 | 2270 |
| 21  | 2380 | 2280  | 2270 | 2450 | 2070 | 2300 | 2140 | 2180 | 2280 | 2230 | 2340 | 2320 |
| 22  | 2420 | 2280  | 2320 | 2510 | 2100 | 2300 | 2140 | 2180 | 2300 | 2130 | 2340 | 2280 |
| 23  | 2340 | 2270  | 2330 | 2510 | 2090 | 2300 | 1930 | 2180 | 2320 | 2180 | 2340 | 2280 |
| 24  | 2320 | 2270  | 2330 | 2550 | 2080 | 2300 | 1930 | 2080 | 2220 | 2180 | 2340 | 2280 |
| 25  | 2320 | 2280  | 2300 | 2550 | 2090 | 2290 | 1930 | 2160 | 2220 | 2180 | 2340 | 2330 |
| 26  | 2350 | ----  | 2550 | 2520 | 2100 | 2300 | 1930 | 2070 | 2180 | 2190 | 2330 | 2320 |
| 27  | 2350 | ----  | 2590 | 2520 | 2090 | 2280 | 1930 | 2070 | 2180 | 2180 | 2320 | 2320 |
| 28  | 2330 | ----  | 2580 | 2520 | 2090 | 2270 | 1930 | 2070 | 2180 | 2100 | 2320 | 2320 |
| 29  | 2340 | ----  | 2600 | 2530 | 2100 | 2290 | 2000 | 2070 | 2160 | 2180 | 2310 | 2270 |
| 30  | 2310 | ----  | 2600 | 2570 | ---- | 2280 | 1990 | 2070 | 2180 | 2170 | 2220 | 2260 |
| 31  | 2320 | ----  | 2580 | 2520 | ---- | 2290 | ---- | 2070 | ---- | 2170 | 2280 | ---- |
| AVG | 2360 | C2260 | 2440 | 2430 | 2100 | 2220 | 2110 | 2110 | 2240 | 2200 | 2300 | 2290 |

C Based on 25 days of data.



## CHEYENNE RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC | JAN | FEB | MAR | APR  | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|------|-----|-----|-----|-----|------|------|------|------|------|------|
| 1   | 13.0 | 10.0 | 1.0 | 1.0 | 1.0 | 1.0 | 6.0  | 8.0  | 24.0 | 24.0 | 24.0 | 22.0 |
| 2   | 13.0 | 10.0 | 1.0 | 1.0 | 1.0 | 1.0 | 8.0  | 8.0  | 24.0 | 24.0 | 24.0 | 22.0 |
| 3   | 14.0 | 8.0  | 1.0 | 1.0 | 1.0 | 1.0 | 8.0  | 8.0  | 24.0 | 24.0 | 24.0 | 24.0 |
| 4   | 15.0 | 8.0  | 1.0 | 1.0 | 1.0 | 1.0 | 8.0  | 8.0  | 20.0 | 24.0 | 24.0 | 22.0 |
| 5   | 14.0 | 6.0  | 1.0 | 1.0 | 1.0 | 1.0 | 10.0 | 8.0  | 20.0 | 24.0 | 22.0 | 22.0 |
| 6   | 14.0 | 3.0  | 1.0 | 1.0 | 1.0 | 1.0 | 12.0 | 8.0  | 20.0 | 26.0 | 24.0 | 22.0 |
| 7   | 14.0 | 3.0  | 1.0 | 1.0 | 1.0 | 1.0 | 12.0 | 10.0 | 20.0 | 26.0 | 24.0 | 22.0 |
| 8   | 14.0 | 2.0  | 0.0 | 1.0 | 1.0 | 1.0 | 12.0 | 10.0 | 20.0 | 24.0 | 24.0 | 22.0 |
| 9   | 14.0 | 2.0  | 1.0 | 1.0 | 1.0 | 1.0 | 13.0 | 10.0 | 22.0 | 24.0 | 26.0 | 22.0 |
| 10  | 14.0 | 2.0  | 1.0 | 1.0 | 1.0 | 1.0 | 13.0 | 8.0  | 20.0 | 26.0 | 26.0 | 22.0 |
| 11  | 13.0 | 3.0  | 1.0 | 1.0 | 1.0 | 3.0 | 12.0 | 8.0  | 18.0 | 26.0 | 26.0 | 20.0 |
| 12  | 13.0 | 3.0  | 1.0 | 1.0 | 1.0 | 3.0 | 12.0 | 8.0  | 18.0 | 26.0 | 28.0 | 20.0 |
| 13  | 13.0 | 3.0  | 1.0 | 0.0 | 1.0 | 2.0 | 13.0 | 10.0 | 18.0 | 26.0 | 28.0 | 20.0 |
| 14  | 13.0 | 3.0  | 1.0 | 0.0 | 1.0 | 2.0 | 13.0 | 12.0 | 20.0 | 26.0 | 26.0 | 20.0 |
| 15  | 13.0 | 3.0  | 1.0 | 0.0 | 1.0 | 3.0 | 13.0 | 12.0 | 20.0 | 26.0 | 26.0 | 20.0 |
| 16  | 13.0 | 2.0  | 1.0 | 0.0 | 1.0 | 3.0 | 15.0 | 12.0 | 20.0 | 26.0 | 26.0 | 20.0 |
| 17  | 13.0 | 2.0  | 1.0 | 0.0 | 1.0 | 3.0 | 15.0 | 14.0 | 22.0 | 26.0 | 26.0 | 20.0 |
| 18  | 13.0 | 3.0  | 1.0 | 0.5 | 2.0 | 5.0 | 13.0 | 14.0 | 20.0 | 24.0 | 26.0 | 20.0 |
| 19  | 13.0 | 3.0  | 1.0 | 0.5 | 2.0 | 5.0 | 13.0 | 16.0 | 22.0 | 26.0 | 26.0 | 20.0 |
| 20  | 14.0 | 3.0  | 1.0 | 0.5 | 2.0 | 8.0 | 13.0 | 16.0 | 22.0 | 28.0 | 28.0 | 20.0 |
| 21  | 13.0 | 3.0  | 1.0 | 0.5 | 2.0 | 8.0 | 13.0 | 16.0 | 20.0 | 28.0 | 28.0 | 20.0 |
| 22  | 12.0 | 3.0  | 1.0 | 0.5 | 2.0 | 8.0 | 13.0 | 20.0 | 22.0 | 24.0 | 28.0 | 20.0 |
| 23  | 13.0 | 2.0  | 1.0 | 0.0 | 2.0 | 8.0 | 13.0 | 20.0 | 22.0 | 24.0 | 26.0 | 20.0 |
| 24  | 12.0 | 2.0  | 1.0 | 0.0 | 1.0 | 8.0 | 14.0 | 20.0 | 24.0 | 22.0 | 26.0 | 20.0 |
| 25  | 13.0 | 2.0  | 1.0 | 0.0 | 1.0 | 8.0 | 14.0 | 22.0 | 24.0 | 24.0 | 26.0 | 20.0 |
| 26  | 14.0 | 2.0  | 1.0 | 0.0 | 1.0 | 7.0 | 14.0 | 22.0 | 24.0 | 24.0 | 26.0 | 20.0 |
| 27  | 13.0 | 2.0  | 0.0 | 0.0 | 1.0 | 7.0 | 12.0 | 22.0 | 24.0 | 24.0 | 26.0 | 20.0 |
| 28  | 13.0 | 1.0  | 1.0 | 1.0 | 1.0 | 6.0 | 12.0 | 22.0 | 24.0 | 24.0 | 26.0 | 20.0 |
| 29  | 12.0 | 1.0  | 1.0 | 1.0 | 1.0 | 6.0 | 10.0 | 24.0 | 24.0 | 24.0 | 26.0 | 20.0 |
| 30  | 12.0 | 1.0  | 1.0 | 1.0 | --- | 6.0 | 10.0 | 24.0 | 24.0 | 24.0 | 26.0 | 20.0 |
| 31  | 12.0 | ---  | 1.0 | 1.0 | --- | 6.0 | ---  | 24.0 | ---  | 24.0 | 22.0 | ---  |
| AVG | 13.0 | 3.5  | 1.0 | 0.5 | 1.0 | 4.0 | 12.0 | 14.5 | 21.5 | 25.0 | 25.5 | 20.5 |

## 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 SW 1/4 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 1972.  
Water temperatures: May 1964 to September 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(S04)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.<br>19... | 1200 | 13                                 | 9.7                                                     | 56                                                          | 30                                                                 | 1.7                                                   | 1.2                                                               | 315                                             | 7.5                                                     | 1.6                                                          | .1                                                          | .16                                                                      |
| NOV.<br>16... | 1400 | 13                                 | 9.3                                                     | 54                                                          | 28                                                                 | 1.8                                                   | 1.1                                                               | 296                                             | .3                                                      | 2.2                                                          | .1                                                          | .17                                                                      |
| DEC.<br>14... | 1200 | 14                                 | 10                                                      | 56                                                          | 30                                                                 | 1.6                                                   | 1.6                                                               | 329                                             | 7.3                                                     | 2.4                                                          | .0                                                          | .24                                                                      |
| JAN.<br>10... | 1130 | 12                                 | 9.7                                                     | 57                                                          | 31                                                                 | 1.7                                                   | 1.1                                                               | 317                                             | 6.6                                                     | 2.3                                                          | .0                                                          | .25                                                                      |
| FEB.<br>15... | 1000 | 8.3                                | 9.5                                                     | 59                                                          | 29                                                                 | 1.3                                                   | 1.5                                                               | 322                                             | 6.7                                                     | 2.4                                                          | .0                                                          | .22                                                                      |
| MAR.<br>15... | 1015 | 14                                 | 9.3                                                     | 56                                                          | 29                                                                 | 1.3                                                   | 3.9                                                               | 320                                             | 6.7                                                     | 2.3                                                          | .1                                                          | .32                                                                      |
| APR.<br>10... | 1430 | 16                                 | 8.6                                                     | 56                                                          | 29                                                                 | 2.0                                                   | 1.2                                                               | 306                                             | 6.7                                                     | .9                                                           | .1                                                          | .06                                                                      |
| MAY<br>17...  | 1100 | 17                                 | 8.3                                                     | 54                                                          | 28                                                                 | 1.4                                                   | 1.0                                                               | 307                                             | 11                                                      | 1.7                                                          | .3                                                          | .11                                                                      |
| JULY<br>31... | 1100 | 12                                 | 8.6                                                     | 50                                                          | 29                                                                 | 1.2                                                   | .9                                                                | 301                                             | 7.0                                                     | 1.0                                                          | .1                                                          | .07                                                                      |
| AUG.<br>22... | 1300 | 11                                 | 8.4                                                     | 52                                                          | 30                                                                 | 1.3                                                   | .9                                                                | 282                                             | 6.5                                                     | 1.2                                                          | .2                                                          | .01                                                                      |
| SEP.<br>11... | 1100 | 12                                 | 8.2                                                     | 54                                                          | 29                                                                 | 1.0                                                   | 1.1                                                               | 306                                             | 9.4                                                     | .7                                                           | .2                                                          | .02                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

## CHEYENNE RIVER BASIN

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

## EXTREMES.--1971-72:

Water temperatures: Maximum, 17°C Aug. 14, 15; minimum, freezing point on many days during November 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 period.

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(R)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(03400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>19... | --                                                                  | .060                                                 | 10                                                  | 263                                                                  | .36                                                           | 9.37                                                        | 260                                           | 5                                                            | .0                                                 | 467                                                                   | 8.0                      | 3.5                                    |
| NOV.<br>16... | --                                                                  | .050                                                 | 20                                                  | 243                                                                  | .33                                                           | 8.52                                                        | 250                                           | 7                                                            | .1                                                 | 446                                                                   | 8.0                      | 1.5                                    |
| DEC.<br>14... | --                                                                  | .070                                                 | 20                                                  | 272                                                                  | .37                                                           | 10.6                                                        | 260                                           | 0                                                            | .0                                                 | 489                                                                   | 8.0                      | .0                                     |
| JAN.<br>10... | --                                                                  | .020                                                 | 20                                                  | 266                                                                  | .36                                                           | 8.76                                                        | 270                                           | 10                                                           | .0                                                 | 458                                                                   | 8.1                      | .0                                     |
| FEB.<br>15... | .020                                                                | .020                                                 | 20                                                  | 269                                                                  | .37                                                           | 6.02                                                        | 270                                           | 3                                                            | .0                                                 | 450                                                                   | 8.1                      | .5                                     |
| MAR.<br>15... | .020                                                                | .10                                                  | 20                                                  | 267                                                                  | .36                                                           | 10.1                                                        | 260                                           | 0                                                            | .0                                                 | 462                                                                   | 8.2                      | 1.0                                    |
| APR.<br>10... | .040                                                                | .040                                                 | 20                                                  | 255                                                                  | .35                                                           | 11.0                                                        | 260                                           | 8                                                            | .1                                                 | 441                                                                   | 8.3                      | 7.0                                    |
| MAY<br>17...  | .020                                                                | .050                                                 | 0                                                   | 257                                                                  | .35                                                           | 11.8                                                        | 250                                           | 0                                                            | .0                                                 | 457                                                                   | 8.2                      | 9.0                                    |
| JULY<br>31... | .090                                                                | .090                                                 | 20                                                  | 246                                                                  | .33                                                           | 7.97                                                        | 240                                           | 0                                                            | .0                                                 | 448                                                                   | 8.1                      | 13.5                                   |
| AUG.<br>22... | --                                                                  | .030                                                 | 10                                                  | 239                                                                  | .33                                                           | 7.10                                                        | 250                                           | 22                                                           | .0                                                 | 427                                                                   | 8.1                      | 13.0                                   |
| SEP.<br>11... | --                                                                  | .020                                                 | 0                                                   | 254                                                                  | .35                                                           | 8.23                                                        | 250                                           | 3                                                            | .0                                                 | 442                                                                   | 8.1                      | 8.5                                    |

## CHEYENNE RIVER BASIN

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

## FIELD DETERMINATIONS

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | AIR<br>TEMP-<br>ERATURE<br>(DEG C)<br>(00020) | DIS-<br>SOLVED<br>OXYGEN<br>(MG/L)<br>(00300) | BIO-<br>CHEM-<br>ICAL<br>OXYGEN<br>DEMAND<br>(MG/L)<br>(00310) | PH<br>(UNITS)<br>(00400) | IMME-<br>DIATE<br>COLI-<br>FORM<br>(COL.<br>PER<br>100 ML)<br>(31501) |
|---------------|------|------------------------------------|----------------------------------------|-----------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------|
| OCT.<br>19... | 1200 | 13                                 | 3.5                                    | 8.0                                           | 11.5                                          | 1.0                                                            | 9.1                      | 1500                                                                  |
| NOV.<br>16... | 1400 | 13                                 | 1.5                                    | 2.0                                           | 11.4                                          | .8                                                             | 8.6                      | 103                                                                   |
| DEC.<br>14... | 1200 | 14                                 | .0                                     | -3.5                                          | 10.8                                          | .6                                                             | 8.4                      | --                                                                    |
| JAN.<br>10... | 1130 | 12                                 | .0                                     | -7.0                                          | 11.1                                          | .8                                                             | 8.7                      | 1300                                                                  |
| FEB.<br>15... | 1130 | 8.3                                | .5                                     | -3.0                                          | 11.2                                          | .4                                                             | --                       | 36                                                                    |
| MAR.<br>15... | 1015 | 14                                 | 1.0                                    | 4.0                                           | 11.2                                          | 1.0                                                            | 8.4                      | 150                                                                   |
| APR.<br>10... | 1430 | 16                                 | 7.0                                    | 12.0                                          | 9.6                                           | 1.2                                                            | 8.2                      | 220                                                                   |
| MAY<br>17...  | 1100 | 17                                 | 9.0                                    | 33.5                                          | 9.7                                           | 1.2                                                            | 8.3                      | 870                                                                   |
| JULY<br>31... | 1100 | 12                                 | 13.5                                   | 13.0                                          | 8.1                                           | 1.6                                                            | 8.0                      | 57                                                                    |
| AUG.<br>22... | 1300 | 11                                 | 13.0                                   | 20.5                                          | 9.7                                           | 1.9                                                            | 9.7                      | 3000                                                                  |
| SEP.<br>11... | 1100 | 12                                 | 8.5                                    | 16.5                                          | 10.0                                          | 1.4                                                            | --                       | 130                                                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDED<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PENDED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------|
| OCT.<br>19... | 1200 | 3.5                                    | 13                                                       | 58                                                   | 2.0                                                                     |
| NOV.<br>16... | 1400 | 1.5                                    | 13                                                       | 43                                                   | 1.5                                                                     |
| DEC.<br>14... | 1200 | .0                                     | 14                                                       | 88                                                   | 3.3                                                                     |
| JAN.<br>10... | 1130 | .0                                     | 12                                                       | 91                                                   | 2.9                                                                     |
| FEB.<br>15... | 1000 | .5                                     | 8.3                                                      | 68                                                   | 1.5                                                                     |
| MAR.<br>15... | 1015 | 1.0                                    | 14                                                       | 100                                                  | 3.8                                                                     |
| APR.<br>10... | 1430 | 7.0                                    | 16                                                       | 71                                                   | 3.1                                                                     |
| MAY<br>17...  | 1100 | 9.0                                    | 17                                                       | 81                                                   | 3.7                                                                     |
| JULY<br>31... | 1100 | 13.5                                   | 12                                                       | 51                                                   | 1.7                                                                     |
| AUG.<br>22... | 1300 | 13.0                                   | 11                                                       | 75                                                   | 22                                                                      |
| SEP.<br>11... | 1100 | 8.5                                    | 12                                                       | 41                                                   | 1.3                                                                     |

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972  
(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   | 9.0     | 8.0 | 0.5      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 2   | 8.0     | 5.5 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 3   | 5.5     | 5.0 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 4   | 6.5     | 5.5 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 5   | 7.0     | 6.0 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 6   | 8.0     | 6.5 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 7   | 8.0     | 6.5 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 8   | 7.0     | 6.5 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 9   | 6.0     | 4.5 | 0.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 10  | 7.0     | 5.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.5   | 0.0 |
| 11  | 7.0     | 6.0 | 1.0      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 1.5   | 0.5 |
| 12  | 7.0     | 6.5 | 1.5      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 1.5   | 1.0 |
| 13  | 6.0     | 5.0 | 1.5      | 1.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 3.0   | 1.0 |
| 14  | 5.0     | 4.5 | 3.0      | 1.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 1.5   | 1.0 |
| 15  | 4.5     | 4.5 | 1.5      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 2.0   | 1.0 |
| 16  | 4.0     | 3.5 | 1.5      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 2.0   | 1.0 |
| 17  | 5.5     | 4.5 | 1.0      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 3.5   | 1.5 |
| 18  | 5.0     | 4.0 | 1.0      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 4.0   | 1.0 |
| 19  | 4.0     | 3.0 | 1.0      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 4.0   | 1.0 |
| 20  | 3.5     | 3.0 | 1.0      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 3.5   | 2.0 |
| 21  | 3.5     | 3.0 | 1.0      | 1.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 4.0   | 1.0 |
| 22  | 3.5     | 3.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 5.0   | 1.0 |
| 23  | 3.5     | 3.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 4.0   | 2.0 |
| 24  | 4.0     | 3.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 4.0   | 0.5 |
| 25  | 4.0     | 3.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 3.0   | 0.5 |
| 26  | 5.0     | 4.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 3.0   | 1.0 |
| 27  | 4.5     | 2.0 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.5   | 0.5 |
| 28  | 2.0     | 1.0 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.5   | 0.0 |
| 29  | 1.0     | 0.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 0.0   | 0.0 |
| 30  | 0.5     | 0.5 | 0.5      | 0.5 | 0.0      | 0.0 | 0.0     | 0.0 | ---      | --- | 0.0   | 0.0 |
| 31  | 0.5     | 0.5 | ---      | --- | 0.0      | 0.0 | 0.0     | 0.0 | ---      | --- | 0.5   | 0.5 |
| AVG | 9.0     | 0.5 | 3.0      | 0.0 | 0.0      | 0.0 | 0.0     | 0.0 | 0.0      | 0.0 | 5.0   | 0.0 |

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



## CHEYENNE RIVER BASIN

06411500 RAPID CREEK BELOW PACTOLA DAM, S. DAK.

LOCATION.--Lat 44°04'36", long 103°28'54", in SW¼NE¼ 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 1972.  
Water temperatures: October 1968 to September 1972.

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 229 mg/l Jan. 1-31; minimum, 201 mg/l Nov. 1-30.

Hardness: Maximum, 190 mg/l Jan. 1 to Feb. 29, June 1-30; minimum, 170 mg/l Dec. 1-31, May 1-31.

Specific conductance: Maximum daily, 400 micromhos Feb. 27; minimum daily, 320 micromhos Apr. 28-30.

Water temperatures: Maximum, 9.0°C June 21-22; minimum, 2.0°C on many days during December to February.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 15                                         | 10                                                      | 40                                                          | 19                                                                 | 3.3                                                   | 2.7                                                               | 168                                             | 44                                                      | 3.2                                                          | .2                                                          | .25                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 18                                         | 9.6                                                     | 39                                                          | 19                                                                 | 3.1                                                   | 3.7                                                               | 169                                             | 40                                                      | 2.9                                                          | .3                                                          | .05                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 18                                         | 10                                                      | 38                                                          | 18                                                                 | 3.1                                                   | 2.6                                                               | 170                                             | 51                                                      | 1.3                                                          | .2                                                          | .05                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 18                                         | 10                                                      | 42                                                          | 20                                                                 | 3.1                                                   | 2.5                                                               | 190                                             | 56                                                      | 1.4                                                          | .1                                                          | .11                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 19                                         | 10                                                      | 44                                                          | 20                                                                 | 2.2                                                   | 2.5                                                               | 183                                             | 50                                                      | 1.3                                                          | .1                                                          | .22                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 64                                         | 9.4                                                     | 38                                                          | 20                                                                 | 3.2                                                   | 2.6                                                               | 174                                             | 46                                                      | 1.5                                                          | .4                                                          | .04                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 40                                         | 8.6                                                     | 39                                                          | 19                                                                 | 3.3                                                   | 2.7                                                               | 175                                             | 44                                                      | 1.8                                                          | .3                                                          | .02                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 47                                         | 8.1                                                     | 38                                                          | 19                                                                 | 3.2                                                   | 2.6                                                               | 170                                             | 45                                                      | 1.7                                                          | .4                                                          | .01                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 79                                         | 9.6                                                     | 45                                                          | 19                                                                 | 3.4                                                   | 2.8                                                               | 168                                             | 65                                                      | 2.1                                                          | .4                                                          | .02                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 127                                        | 8.4                                                     | 39                                                          | 19                                                                 | 2.9                                                   | 2.4                                                               | 174                                             | 48                                                      | 1.8                                                          | .2                                                          | .02                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 89                                         | 8.6                                                     | 39                                                          | 19                                                                 | 3.0                                                   | 2.4                                                               | 175                                             | 55                                                      | 2.0                                                          | .2                                                          | .04                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 58                                         | 8.8                                                     | 39                                                          | 19                                                                 | 3.0                                                   | 2.7                                                               | 182                                             | 46                                                      | 2.9                                                          | .3                                                          | .05                                                                      |
| WTD. AVG.           | --   | --                                         | 8.9                                                     | 40                                                          | 19                                                                 | 3.1                                                   | 2.6                                                               | 174                                             | 50                                                      | 2.0                                                          | .3                                                          | .04                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | 50                                         | 9.3                                                     | 40                                                          | 19                                                                 | 3.1                                                   | 2.7                                                               | 175                                             | 49                                                      | 2.0                                                          | .3                                                          | .07                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 438                                                     | 1950                                                        | 936                                                                | 151                                                   | 127                                                               | 8520                                            | 2470                                                    | 96                                                           | 14                                                          | 2.1                                                                      |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |     |     |    |    |     |     |     |    |     |    |     |
|-------|------|-----|-----|----|----|-----|-----|-----|----|-----|----|-----|
| APR.  |      |     |     |    |    |     |     |     |    |     |    |     |
| 11... | 1530 | A30 | 8.6 | 43 | 21 | 4.2 | 2.6 | 172 | 49 | 1.9 | .3 | .02 |
| AUG.  |      |     |     |    |    |     |     |     |    |     |    |     |
| 14... | 1500 | A76 | 8.1 | 38 | 19 | 2.8 | 2.5 | 173 | 44 | 1.6 | .3 | .04 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for sample Feb. 1-29, 4.0 mg/l; all other samples, 0.0 mg/l.  
A Discharge at time of sampling.

## CHEYENNE RIVER BASIN

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1968-69, 1970-72): Maximum, 260 mg/l July 1 to Sept. 30, 1969; minimum, 201 mg/l Nov. 1-30, 1971.

Hardness (1968-69, 1970-72): Maximum, 206 mg/l Jan. 1 to Mar. 31, 1969; minimum, 170 mg/l June 1-30, Aug. 1 to Sept. 30, Dec. 1-31, 1971, May 1-31, 1972.

Specific conductance: Maximum daily, 435 micromhos Feb. 8, 17, 22, 1971; minimum daily, 238 micromhos Mar. 28-30.

Water temperatures: Maximum, 9.0°C June 21-22, 1972; minimum, freezing point on several days during December 1968.

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>01-31       | --                                                                  | .030                                                 | 20                                                  | 206                                                                       | .28                                                           | 8.34                                                        | 180                                           | 40                                                           | .1                                                 | 344                                                                   | 8.0                      | --                                     |
| NOV.<br>01-30       | --                                                                  | --                                                   | 20                                                  | 201                                                                       | .27                                                           | 9.77                                                        | 180                                           | 37                                                           | .1                                                 | 339                                                                   | 7.9                      | --                                     |
| DEC.<br>01-31       | .020                                                                | .10                                                  | 0                                                   | 208                                                                       | .28                                                           | 10.1                                                        | 170                                           | 30                                                           | .1                                                 | 335                                                                   | 8.1                      | --                                     |
| JAN.<br>01-31       | .010                                                                | .040                                                 | 4                                                   | 229                                                                       | .31                                                           | 11.1                                                        | 190                                           | 31                                                           | .1                                                 | 364                                                                   | 8.1                      | --                                     |
| FEB.<br>01-29       | .030                                                                | .060                                                 | 10                                                  | 225                                                                       | .31                                                           | 11.5                                                        | 190                                           | 35                                                           | .1                                                 | 372                                                                   | 8.4                      | --                                     |
| MAR.<br>01-31       | .020                                                                | .020                                                 | 20                                                  | 207                                                                       | .28                                                           | 35.8                                                        | 180                                           | 34                                                           | .1                                                 | 346                                                                   | 7.9                      | --                                     |
| APR.<br>01-30       | .020                                                                | .020                                                 | 10                                                  | 205                                                                       | .28                                                           | 22.1                                                        | 180                                           | 32                                                           | .1                                                 | 346                                                                   | 7.9                      | --                                     |
| MAY<br>01-31        | .020                                                                | .020                                                 | 10                                                  | 202                                                                       | .27                                                           | 25.6                                                        | 170                                           | 34                                                           | .1                                                 | 341                                                                   | 8.0                      | --                                     |
| JUNE<br>01-30       | .020                                                                | .020                                                 | 20                                                  | 230                                                                       | .31                                                           | 49.1                                                        | 190                                           | 53                                                           | .1                                                 | 385                                                                   | 7.8                      | --                                     |
| JULY<br>01-31       | .020                                                                | .030                                                 | 10                                                  | 207                                                                       | .28                                                           | 71.0                                                        | 180                                           | 33                                                           | .1                                                 | 340                                                                   | 8.1                      | --                                     |
| AUG.<br>01-31       | .010                                                                | .020                                                 | 30                                                  | 215                                                                       | .29                                                           | 51.7                                                        | 180                                           | 32                                                           | .1                                                 | 352                                                                   | 8.0                      | --                                     |
| SEP.<br>01-30       | .020                                                                | .060                                                 | 20                                                  | 211                                                                       | .29                                                           | 33.0                                                        | 180                                           | 26                                                           | .1                                                 | 347                                                                   | 8.0                      | --                                     |
| WTD. AVG.           | B.019                                                               | C.031                                                | 16                                                  | 212                                                                       | .29                                                           | --                                                          | 181                                           | 35                                                           | .1                                                 | 351                                                                   | 8.0                      | --                                     |
| TIME WTD.           | B.019                                                               | C.039                                                | 14                                                  | 212                                                                       | .29                                                           | --                                                          | 181                                           | 35                                                           | .1                                                 | 351                                                                   | 8.0                      | --                                     |
| AVG.                | B.019                                                               | C.039                                                | 14                                                  | 212                                                                       | .29                                                           | --                                                          | 181                                           | 35                                                           | .1                                                 | 351                                                                   | 8.0                      | --                                     |
| TOT. LOAD<br>(TONS) | B.85                                                                | C1.5                                                 | 1                                                   | 10400                                                                     | --                                                            | --                                                          | --                                            | --                                                           | --                                                 | --                                                                    | --                       | --                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|               |      |      |    |     |     |      |     |    |    |     |     |      |
|---------------|------|------|----|-----|-----|------|-----|----|----|-----|-----|------|
| APR.<br>11... | .010 | .020 | 10 | 215 | .29 | 17.6 | 190 | 53 | .1 | 340 | 8.1 | 6.5  |
| AUG.<br>14... | 1.2  | .030 | 20 | 205 | .28 | 42.3 | 170 | 31 | .1 | 348 | 7.8 | 11.8 |

B Based on 301 days of chemical analysis.

C Based on 336 days of chemical analysis.

## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV | DEC  | JAN  | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-----|------|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | 346  | 336 | 365  | ---  | 370 | 370 | 360 | 330 | 340 | 350 | 360 | 355 |
| 2   | 346  | 329 | 350  | 365  | 370 | 370 | 360 | 330 | 340 | 350 | 360 | 355 |
| 3   | 345  | 331 | 350  | 365  | 370 | 370 | 360 | 330 | 340 | 350 | 360 | --- |
| 4   | 345  | 330 | 345  | 365  | 370 | 370 | 370 | 330 | 340 | 350 | 360 | 355 |
| 5   | 345  | 329 | 340  | 365  | 370 | 370 | 370 | 330 | 350 | 345 | 355 | 355 |
| 6   | 350  | 326 | 345  | 370  | 370 | 370 | 370 | 330 | 350 | 345 | 355 | 355 |
| 7   | 366  | 326 | 340  | 370  | 370 | 370 | 370 | 330 | 350 | 345 | 355 | 355 |
| 8   | ---  | 325 | 340  | 375  | 370 | 360 | 370 | 330 | 350 | 345 | 360 | 355 |
| 9   | ---  | 325 | 340  | 380  | 370 | 360 | 370 | 330 | 350 | 345 | 355 | 355 |
| 10  | ---  | 326 | 350  | 375  | 370 | 360 | 370 | 330 | --- | 345 | 360 | 350 |
| 11  | 349  | 328 | 350  | 375  | 370 | 360 | 370 | 330 | --- | 350 | 365 | 355 |
| 12  | 340  | 337 | 350  | 380  | 370 | 360 | 370 | 330 | --- | 350 | 360 | 355 |
| 13  | 342  | 337 | 350  | 380  | 370 | 360 | 370 | 330 | --- | 345 | 360 | 355 |
| 14  | ---  | 337 | 345  | 380  | 370 | 360 | 370 | 330 | 360 | 340 | 360 | 355 |
| 15  | ---  | 337 | 340  | 380  | 370 | 370 | 370 | 330 | 350 | 345 | 360 | 355 |
| 16  | 342  | 341 | 340  | 380  | 370 | 360 | 370 | 330 | 350 | 340 | 360 | 350 |
| 17  | 342  | 337 | 340  | 380  | 370 | 360 | 370 | 330 | 350 | 340 | 360 | 350 |
| 18  | 342  | 334 | 350  | 380  | 370 | 360 | 370 | 330 | --- | 340 | 360 | 350 |
| 19  | 340  | 334 | 350  | 380  | 370 | 360 | 370 | 330 | --- | 340 | 360 | 350 |
| 20  | 342  | 333 | 350  | 380  | 370 | 360 | 370 | 330 | --- | 345 | 355 | 355 |
| 21  | 344  | 337 | 350  | 380  | 370 | 360 | 370 | 330 | --- | 355 | 365 | 355 |
| 22  | 342  | 337 | 345  | 380  | 370 | 360 | 350 | 330 | --- | 350 | 365 | 355 |
| 23  | 344  | 333 | 340  | 380  | 370 | 360 | 330 | 330 | 350 | 345 | 365 | 355 |
| 24  | 344  | 333 | 345  | ---  | 370 | 360 | 330 | 330 | 350 | 345 | 365 | 355 |
| 25  | 344  | 334 | 345  | ---  | 370 | 360 | 330 | 330 | 350 | 345 | 365 | 355 |
| 26  | 346  | 337 | 350  | ---  | 370 | 360 | 330 | 330 | 350 | 345 | 365 | 355 |
| 27  | 343  | 336 | 350  | ---  | 400 | 360 | 330 | 330 | 350 | 345 | 360 | 355 |
| 28  | 343  | 335 | 350  | 380  | 370 | 360 | 320 | 330 | 350 | 345 | 360 | 355 |
| 29  | 342  | 338 | ---  | 380  | 370 | 360 | 320 | 330 | 350 | 345 | 360 | 350 |
| 30  | 342  | 338 | 350  | 385  | --- | 360 | 320 | 330 | 350 | 345 | 360 | 350 |
| 31  | 342  | --- | 350  | 390  | --- | 360 | --- | 330 | --- | 345 | 360 | --- |
| AVG | D373 | 333 | E347 | D377 | 371 | 363 | 357 | 330 | --- | 346 | 360 | 354 |

D Based on 26 days of data.

E Based on 30 days of data.

## CHEYENNE RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| 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 | 3.0 | 5.0 | 6.5 | 7.0 | 7.0 | 8.0  |
| 2   | 6.0  | 6.0 | 4.0  | 3.0  | 2.0 | 3.0 | 3.0 | 5.0 | 6.5 | 7.0 | 7.0 | 8.0  |
| 3   | 6.0  | 6.0 | 4.0  | 2.0  | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 7.0 | ---  |
| 4   | 6.0  | 6.0 | 4.0  | 2.0  | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0  |
| 5   | 6.0  | 6.0 | 4.0  | 2.0  | 2.0 | 3.0 | 4.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0  |
| 6   | 6.0  | 6.0 | 4.0  | 3.0  | 2.0 | 3.0 | 5.0 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0  |
| 7   | 8.0  | 6.0 | 4.0  | 3.0  | 3.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 8   | 8.0  | 6.0 | 4.0  | 3.0  | 3.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 9   | 8.0  | 6.0 | 4.0  | 3.0  | 3.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 10  | 8.0  | 6.0 | 3.0  | 3.0  | 2.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 11  | 7.0  | 6.0 | 3.0  | 3.0  | 2.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 12  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 13  | 7.0  | 6.0 | 3.0  | 2.0  | 3.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 14  | ---  | 6.0 | 3.0  | 2.0  | 3.0 | 3.0 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 15  | ---  | 6.0 | 3.0  | 2.0  | 3.0 | 3.5 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 16  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 17  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 5.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 18  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 19  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 4.5 | 6.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 20  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 7.0 | 8.0  |
| 21  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 9.0 | 7.0 | 8.0 | 8.0  |
| 22  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 9.0 | 7.0 | 8.0 | 8.0  |
| 23  | 7.0  | 6.0 | 3.0  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 24  | 7.0  | 6.0 | 3.0  | ---  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 25  | 7.0  | 6.0 | 3.0  | ---  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 26  | 7.0  | 6.0 | 2.0  | ---  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 27  | 7.0  | 6.0 | 2.0  | ---  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 28  | 6.0  | 5.0 | 2.0  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 29  | 6.0  | 5.0 | ---  | 3.0  | 3.0 | 3.5 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 30  | 6.0  | 5.0 | 3.0  | 3.0  | --- | 3.0 | 5.0 | 6.0 | 7.0 | 7.0 | 8.0 | 8.0  |
| 31  | 6.0  | --- | 3.0  | 3.0  | --- | 3.0 | --- | 6.0 | --- | 7.0 | 8.0 | ---  |
| AVG | G7.0 | 6.0 | E3.0 | F3.0 | 2.5 | 3.0 | 5.0 | 5.5 | 7.0 | 7.0 | 7.5 | G8.0 |

E Based on 30 days of data.  
 F Based on 27 days of data.  
 G Based on 29 days of data.

## CHEYENNE RIVER BASIN

06421500 RAPID CREEK NEAR FARMINGDALE, S. DAK.

LOCATION.--Lat 43°56'31", long 102°51'12", in SW¼SW¼SW¼ 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 1972.

Water temperatures: October 1955 to September 1958, October 1968 to September 1972.

EXTREMES.--1971-72:

Dissolved solids: Maximum, 705 mg/l Oct. 1-31; minimum, 393 mg/l July 1-31.  
 Hardness: Maximum, 460 mg/l Oct. 1-31; minimum, 290 mg/l June 1 to July 31.  
 Specific conductance: Maximum daily, 1,310 micromhos Oct. 17; minimum daily, 450 micromhos June 11.  
 Water temperatures: Maximum, 26.5°C Aug. 16; minimum, freezing point on many days October to March.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>OIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 42                                         | 4.6                                                     | 110                                                         | 46                                                       | 56                                                    | 6.7                                                               | 277                                             | 290                                                     | 43                                                           | .5                                                          | 1.8                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 60                                         | 4.9                                                     | 110                                                         | 43                                                       | 41                                                    | 7.4                                                               | 252                                             | 260                                                     | 39                                                           | .5                                                          | 3.1                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 48                                         | 10                                                      | 110                                                         | 39                                                       | 43                                                    | 5.5                                                               | 271                                             | 250                                                     | 38                                                           | .5                                                          | 3.9                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 35                                         | 9.5                                                     | 110                                                         | 41                                                       | 42                                                    | 5.4                                                               | 270                                             | 250                                                     | 38                                                           | .6                                                          | 3.7                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 47                                         | 11                                                      | 88                                                          | 34                                                       | 36                                                    | 4.8                                                               | 234                                             | 200                                                     | 32                                                           | .4                                                          | 3.2                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 90                                         | 5.2                                                     | 75                                                          | 31                                                       | 26                                                    | 4.2                                                               | 216                                             | 170                                                     | 20                                                           | .4                                                          | 1.7                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 67                                         | 3.8                                                     | 82                                                          | 34                                                       | 31                                                    | 4.7                                                               | 223                                             | 200                                                     | 24                                                           | .5                                                          | 1.1                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 78                                         | 9.6                                                     | 86                                                          | 35                                                       | 36                                                    | 5.0                                                               | 215                                             | 230                                                     | 22                                                           | .5                                                          | 2.0                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 387                                        | 13                                                      | 74                                                          | 26                                                       | 18                                                    | 5.5                                                               | 190                                             | 160                                                     | 12                                                           | .4                                                          | 1.4                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 171                                        | 9.4                                                     | 70                                                          | 28                                                       | 20                                                    | 4.4                                                               | 208                                             | 140                                                     | 13                                                           | .5                                                          | .92                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 98                                         | 8.8                                                     | 79                                                          | 33                                                       | 27                                                    | 5.1                                                               | 226                                             | 180                                                     | 19                                                           | .5                                                          | .78                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 48                                         | 5.2                                                     | 88                                                          | 36                                                       | 34                                                    | 5.2                                                               | 259                                             | 210                                                     | 27                                                           | 1.5                                                         | 1.0                                                                      |
| WTD. AVG.           | --   |                                            | 9.4                                                     | 82                                                          | 32                                                       | 27                                                    | 5.2                                                               | 218                                             | 186                                                     | 20                                                           | .5                                                          | 1.7                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | 97                                         | 7.9                                                     | 90                                                          | 36                                                       | 34                                                    | 5.3                                                               | 237                                             | 212                                                     | 27                                                           | .6                                                          | 2.0                                                                      |
| TOT. LOAD<br>(TONS) | --   |                                            | 905                                                     | 7890                                                        | 3050                                                     | 2630                                                  | 502                                                               | 21000                                           | 17900                                                   | 1970                                                         | 48                                                          | 159                                                                      |

## ANALYSES OF ADDITIONAL SAMPLES

|       |       |    |     |     |    |    |     |     |     |    |    |     |
|-------|-------|----|-----|-----|----|----|-----|-----|-----|----|----|-----|
| JAN.  |       |    |     |     |    |    |     |     |     |    |    |     |
| 18... | A1330 | 36 | 10  | 120 | 46 | 45 | 8.6 | 306 | 250 | 43 | .7 | 1.1 |
| APR.  |       |    |     |     |    |    |     |     |     |    |    |     |
| 10... | A1530 | 52 | .3  | 82  | 36 | 35 | 5.0 | 207 | 200 | 26 | .5 | .72 |
| AUG.  |       |    |     |     |    |    |     |     |     |    |    |     |
| 18... | A1300 | 61 | 5.9 | 91  | 39 | 39 | 5.3 | 251 | 250 | 23 | .6 | .27 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.  
 A Discharge at time of sampling.



## CHEYENNE RIVER BASIN

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1955-58, 1968-69, 1970-72): Maximum, 1,220 mg/l Sept. 12, 1969; minimum, 320 mg/l Nov. 5-7, 1956.

Hardness (1955-58, 1968-69, 1970-72): Maximum, 690 mg/l Oct. 1-7, 9-26, 1956; minimum, 250 mg/l May 1-31, 1971.

Specific conductance (1955-58, 1968-70, 1970-72): Maximum daily, 1,650 micromhos Oct. 16, 1956; minimum daily, 422 micromhos Jan. 8, 1958.

Water temperatures (1955-58, 1968-69, 1971-72): Maximum, 34.0°C (corrected) 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: Hardness, 490 mg/l Jan. 18. Additional samples collected for more comprehensive definition of water quality.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>01-31       | --                                                                  | 1.1                                                  | 230                                                 | 705                                                                       | .96                                                           | 79.9                                                        | 460                                            | 240                                                          | 1.1                                                | 1070                                                                  | 7.9                      | --                                     |
| NOV.<br>01-30       | --                                                                  | --                                                   | 160                                                 | 645                                                                       | .88                                                           | 104                                                         | 450                                            | 240                                                          | .8                                                 | 970                                                                   | 7.8                      | --                                     |
| DEC.<br>01-31       | 1.3                                                                 | 1.4                                                  | 70                                                  | 650                                                                       | .88                                                           | 84.2                                                        | 430                                            | 210                                                          | .9                                                 | 959                                                                   | 8.0                      | --                                     |
| JAN.<br>01-31       | 1.4                                                                 | 1.5                                                  | 150                                                 | 650                                                                       | .88                                                           | 61.4                                                        | 440                                            | 220                                                          | .9                                                 | 931                                                                   | 7.9                      | --                                     |
| FEB.<br>01-29       | 1.3                                                                 | 1.3                                                  | 130                                                 | 540                                                                       | .73                                                           | 68.5                                                        | 360                                            | 170                                                          | .8                                                 | 812                                                                   | 8.2                      | --                                     |
| MAR.<br>01-31       | .78                                                                 | .80                                                  | 100                                                 | 448                                                                       | .61                                                           | 109                                                         | 310                                            | 140                                                          | .6                                                 | 705                                                                   | 8.2                      | --                                     |
| APR.<br>01-30       | .77                                                                 | .74                                                  | 130                                                 | 497                                                                       | .68                                                           | 89.9                                                        | 340                                            | 160                                                          | .7                                                 | 772                                                                   | 8.0                      | --                                     |
| MAY<br>01-31        | .65                                                                 | .66                                                  | 140                                                 | 541                                                                       | .74                                                           | 114                                                         | 360                                            | 180                                                          | .8                                                 | 828                                                                   | 8.0                      | --                                     |
| JUNE<br>01-30       | .21                                                                 | .27                                                  | 100                                                 | 409                                                                       | .56                                                           | 427                                                         | 290                                            | 140                                                          | .5                                                 | 657                                                                   | 8.0                      | --                                     |
| JULY<br>01-31       | .26                                                                 | .28                                                  | 90                                                  | 393                                                                       | .53                                                           | 181                                                         | 290                                            | 120                                                          | .5                                                 | 634                                                                   | 8.2                      | --                                     |
| AUG.<br>01-31       | .42                                                                 | .41                                                  | 120                                                 | 468                                                                       | .64                                                           | 124                                                         | 330                                            | 150                                                          | .6                                                 | 748                                                                   | 8.1                      | --                                     |
| SEP.<br>01-30       | .69                                                                 | .69                                                  | 140                                                 | 541                                                                       | .74                                                           | 70.1                                                        | 370                                            | 160                                                          | .8                                                 | 807                                                                   | 8.2                      | --                                     |
| WTD. AVG.           | B.51                                                                | C.56                                                 | 115                                                 | 479                                                                       | .65                                                           | --                                                          | 333                                            | 158                                                          | .6                                                 | 747                                                                   | 8.1                      | --                                     |
| TIME WTD.<br>AVG.   | B.77                                                                | C.83                                                 | 130                                                 | 541                                                                       | .74                                                           | --                                                          | 369                                            | 178                                                          | .8                                                 | 825                                                                   | 8.0                      | --                                     |
| TOT. LOAD<br>(TONS) | B45                                                                 | C52                                                  | 11                                                  | 46100                                                                     | --                                                            | --                                                          | --                                             | --                                                           | --                                                 | --                                                                    | --                       | --                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|               |     |     |     |     |     |      |     |     |    |      |     |      |
|---------------|-----|-----|-----|-----|-----|------|-----|-----|----|------|-----|------|
| JAN.<br>18... | --  | 1.8 | 160 | 683 | .93 | 66.9 | 490 | 240 | .9 | 1060 | 7.7 | .0   |
| APR.<br>10... | .82 | .95 | 130 | 507 | .69 | 72.3 | 350 | 160 | .8 | 775  | 8.8 | 14.0 |
| AUG.<br>18... | 1.4 | .56 | 170 | 584 | .79 | 96.5 | 390 | 180 | .9 | 880  | 8.1 | 28.0 |

B Based on 305 days of chemical analysis.

C Based on 335 days of chemical analysis.

## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT   | NOV  | DEC  | JAN  | FEB  | MAR  | APR | MAY  | JUN | JUL  | AUG | SEP |
|-----|-------|------|------|------|------|------|-----|------|-----|------|-----|-----|
| 1   | 764   | 1020 | 960  | 1020 | ---  | 730  | 635 | 790  | 730 | 654  | 610 | 945 |
| 2   | 942   | 1000 | 1060 | 1000 | 830  | 830  | 640 | 770  | 780 | 635  | 610 | 990 |
| 3   | 1110  | 1020 | 1080 | 920  | 830  | 840  | 650 | 740  | 850 | 610  | 645 | --- |
| 4   | 1150  | 1010 | 920  | 1000 | 840  | 850  | 630 | 770  | 810 | 605  | 640 | --- |
| 5   | 1130  | 990  | 1010 | 1000 | 840  | 890  | 630 | 790  | 740 | 620  | 660 | --- |
| 6   | 1070  | 985  | 950  | 1100 | 780  | 860  | 690 | 850  | 640 | 605  | 635 | --- |
| 7   | 1070  | 1010 | 980  | 950  | 760  | 710  | 775 | 820  | 610 | 630  | 610 | --- |
| 8   | 1180  | 956  | 920  | 950  | 765  | 600  | 800 | 850  | 620 | ---  | 610 | 825 |
| 9   | 1210  | ---  | 1010 | 1000 | 740  | 610  | 810 | 850  | 640 | 595  | 660 | 875 |
| 10  | 1060  | ---  | 1030 | 950  | 740  | 580  | 825 | 830  | 640 | 645  | --- | 850 |
| 11  | 1060  | 956  | ---  | 910  | 740  | 470  | 785 | 1000 | 450 | 630  | --- | --- |
| 12  | 1130  | 963  | 1050 | 870  | 750  | 530  | 780 | 900  | 570 | 635  | 780 | --- |
| 13  | 1150  | 986  | 1050 | ---  | 830  | 625  | 810 | 930  | 670 | 640  | 845 | --- |
| 14  | 1230  | 972  | 950  | ---  | 770  | 575  | 830 | 900  | 740 | 665  | 855 | --- |
| 15  | 1220  | 1020 | 1000 | ---  | 775  | 600  | 755 | 910  | 740 | 660  | 855 | --- |
| 16  | 1300  | 912  | 1060 | ---  | 780  | 630  | 735 | 820  | 660 | 655  | 830 | 865 |
| 17  | 1310  | 952  | 1020 | ---  | 770  | 595  | 815 | 790  | 660 | 675  | 895 | 795 |
| 18  | 1160  | 985  | 920  | 1080 | 775  | ---  | 805 | 850  | 680 | 670  | 875 | 805 |
| 19  | 1090  | 1000 | 890  | 950  | 800  | ---  | 840 | 850  | 670 | 685  | 945 | --- |
| 20  | 886   | 954  | 900  | 950  | 810  | 680  | 860 | 870  | 750 | 700  | 945 | 785 |
| 21  | 955   | 995  | 825  | 970  | 740  | ---  | 850 | 830  | 760 | 710  | 955 | 840 |
| 22  | 905   | 995  | 810  | 900  | ---  | 685  | 850 | 730  | 760 | 680  | 915 | 885 |
| 23  | ---   | ---  | 910  | 920  | 700  | 700  | 860 | 800  | 770 | 685  | 870 | 880 |
| 24  | ---   | 946  | 890  | 1000 | 700  | 670  | 900 | 740  | 590 | 655  | 875 | 870 |
| 25  | 1100  | 996  | 860  | 1020 | 785  | 670  | 740 | 810  | 610 | 630  | 890 | 860 |
| 26  | 1150  | 983  | 830  | 980  | 780  | 675  | 675 | 740  | 560 | 560  | 895 | 840 |
| 27  | 1030  | 980  | 940  | 1060 | 800  | 660  | 755 | 730  | 570 | 670  | --- | 845 |
| 28  | ---   | 915  | 960  | 1020 | 840  | 690  | 750 | 760  | 600 | 645  | --- | 825 |
| 29  | 965   | 954  | 950  | 1080 | 750  | 660  | 790 | 780  | 620 | 625  | --- | --- |
| 30  | 962   | 938  | 1060 | 1060 | ---  | 650  | 805 | 710  | 630 | 620  | --- | 840 |
| 31  | 1070  | ---  | ---  | 990  | ---  | 660  | --- | 680  | --- | 610  | --- | --- |
| AVG | F1080 | E978 | G958 | D987 | E779 | F676 | 769 | 813  | 671 | H643 | --- | --- |

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

47

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN  | FEB  | MAR  | APR  | MAY  | JUN  | JUL   | AUG  | SEP  |
|-----|------|------|------|------|------|------|------|------|------|-------|------|------|
| 1   | 13.5 | 2.5  | 0.0  | 0.0  | ---  | 0.0  | 1.0  | 7.5  | 18.5 | 19.0  | 18.0 | 18.0 |
| 2   | 10.0 | 3.0  | 0.5  | 0.0  | 0.0  | 0.0  | 2.0  | 5.0  | 20.5 | 17.0  | 18.0 | 14.5 |
| 3   | 8.5  | 1.5  | 0.5  | 0.0  | 0.0  | 0.0  | 3.0  | 6.5  | 20.0 | 14.0  | 16.5 | ---  |
| 4   | 9.0  | 3.0  | 1.0  | 0.0  | 0.0  | 0.0  | 3.5  | 9.0  | 20.5 | 14.0  | 15.0 | ---  |
| 5   | 11.0 | 3.0  | 0.5  | 0.0  | 0.0  | 0.5  | 5.5  | 3.0  | 20.0 | 15.0  | 18.5 | ---  |
| 6   | 11.0 | 0.0  | 0.5  | 0.0  | 0.0  | 3.0  | 10.0 | 11.0 | 19.5 | 18.5  | 20.0 | ---  |
| 7   | 11.5 | 0.0  | 0.0  | 0.5  | 0.0  | 0.0  | 8.5  | 10.0 | 20.0 | 17.5  | 21.5 | ---  |
| 8   | 9.5  | 0.5  | 0.0  | 1.0  | 0.0  | 0.0  | 9.0  | 9.5  | 21.5 | ---   | 19.0 | 15.0 |
| 9   | 7.5  | 1.0  | 0.0  | 0.0  | 0.0  | 1.0  | 8.0  | 9.5  | 23.5 | 20.0  | 20.5 | 17.5 |
| 10  | 8.0  | 0.0  | 0.0  | 0.0  | 0.0  | 1.0  | 10.0 | 9.0  | 21.0 | 21.5  | ---  | 18.5 |
| 11  | 9.5  | 1.0  | 0.0  | 0.0  | 0.0  | 2.0  | 10.5 | 9.5  | 21.0 | 21.0  | ---  | ---  |
| 12  | 11.0 | 2.0  | 0.0  | 0.0  | 0.0  | 1.0  | 12.0 | 10.0 | 19.0 | 21.0  | 26.5 | ---  |
| 13  | 8.0  | 4.0  | 0.0  | 0.0  | 0.0  | 5.0  | 10.5 | 11.0 | 19.0 | 21.0  | 23.5 | ---  |
| 14  | 9.0  | 5.5  | 0.0  | ---  | 0.0  | 7.0  | 5.0  | 12.0 | 20.0 | 20.5  | 23.0 | ---  |
| 15  | 9.5  | 6.0  | 0.0  | ---  | 0.0  | 5.0  | 8.5  | 15.5 | 19.0 | 18.0  | 23.0 | ---  |
| 16  | 9.0  | 3.5  | 0.0  | ---  | 0.0  | 5.0  | 9.0  | 23.0 | 18.0 | 18.5  | 25.0 | 14.0 |
| 17  | 7.0  | 2.5  | 0.0  | ---  | 0.0  | 7.0  | 11.0 | 23.5 | 18.5 | 19.5  | 24.0 | 14.5 |
| 18  | 9.0  | 0.0  | 0.0  | 0.0  | 0.0  | ---  | 9.0  | 20.0 | 19.0 | 18.0  | 23.0 | 17.0 |
| 19  | 8.0  | 0.0  | 0.0  | 0.0  | 0.0  | ---  | 7.0  | 19.5 | 16.0 | 19.5  | 23.5 | ---  |
| 20  | 8.5  | 2.0  | 0.0  | 0.0  | 0.5  | 8.0  | 7.0  | 18.0 | 13.0 | 16.0  | 23.0 | 16.0 |
| 21  | 10.0 | 2.0  | 0.0  | 0.5  | 0.0  | 8.0  | 7.5  | 20.0 | 16.0 | 16.5  | 22.0 | 12.0 |
| 22  | 8.0  | 2.0  | 0.0  | 0.0  | 0.0  | 6.0  | 10.5 | 20.0 | 15.5 | 19.5  | 19.5 | 13.0 |
| 23  | ---  | ---  | 1.0  | 0.0  | 0.0  | 6.0  | 8.5  | 22.5 | 18.0 | 18.0  | 18.0 | 16.0 |
| 24  | ---  | 0.5  | 0.0  | 0.0  | 0.0  | 7.0  | 7.5  | 18.0 | 22.5 | 21.0  | 17.5 | 11.0 |
| 25  | 10.0 | 0.5  | 0.5  | 0.0  | 0.0  | 4.5  | 9.5  | 18.0 | 21.5 | 20.5  | 18.0 | 12.0 |
| 26  | 8.0  | 1.0  | 0.0  | 0.0  | 0.0  | 5.0  | 9.5  | 17.5 | 18.5 | 19.0  | 18.5 | 8.0  |
| 27  | 3.0  | 1.5  | 0.0  | 0.0  | 0.0  | 3.0  | 8.0  | 18.0 | 20.0 | 20.5  | ---  | 10.0 |
| 28  | ---  | 1.0  | 0.0  | 0.0  | 1.0  | 3.0  | 8.0  | 16.0 | 20.0 | 19.0  | ---  | 10.0 |
| 29  | 2.0  | 0.5  | 0.0  | 0.0  | 0.0  | 0.0  | 11.0 | 15.5 | 18.0 | 21.5  | ---  | ---  |
| 30  | 0.0  | 1.0  | ---  | 0.0  | ---  | 2.0  | 9.5  | 15.0 | 19.5 | 21.0  | ---  | 9.5  |
| 31  | 2.0  | ---  | ---  | 0.0  | ---  | 2.5  | ---  | 16.5 | ---  | 19.0  | ---  | ---  |
| AVG | F8.5 | G2.0 | G0.0 | E0.0 | F0.0 | G3.0 | 8.0  | 14.0 | 19.0 | H19.0 | ---  | ---  |

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

06428500 BELLE FOURCHE RIVER AT WYOMING-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 44°44'59", long 104°02'49", in NE¼NW¼ 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 1972.

Water temperatures: October 1965 to September 1972.

EXTREMES.--1971-72:

Specific conductance: Maximum daily, 2,410 micromhos Feb. 6; minimum daily, 490 micromhos Mar. 4.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L) | CAR-<br>BONATE<br>(C03)<br>(MG/L) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L) |
|---------------|------|-------------------------|----------------------------------------------|------------------------------------------|--------------------------------------------------|-----------------------------------------------|--------------------------------------------|--------------------------------------------------------|--------------------------------------|-----------------------------------|----------------------------------------------|---------------------------------------------------|
| OCT.<br>05... | 1330 | 201                     | 8.3                                          | 100                                      | 110                                              | 32                                            | 85                                         | 3.1                                                    | 49                                   | 0                                 | 520                                          | 3.3                                               |
| NOV.<br>16... | 1600 | 62                      | 7.6                                          | 0                                        | 240                                              | 75                                            | 82                                         | 6.6                                                    | 183                                  | 0                                 | 920                                          | 5.2                                               |
| DEC.<br>14... | 1555 | 18                      | 10                                           | 10                                       | 370                                              | 110                                           | 110                                        | 8.5                                                    | 311                                  | 0                                 | 1300                                         | 10                                                |
| JAN.<br>11... | 1245 | 35                      | 10                                           | 50                                       | 410                                              | 47                                            | 110                                        | 7.9                                                    | 299                                  | 0                                 | 1200                                         | 10                                                |
| FEB.<br>15... | 1650 | 30                      | 11                                           | 100                                      | 280                                              | 80                                            | 82                                         | 7.9                                                    | 239                                  | 0                                 | 1000                                         | 7.3                                               |
| MAR.<br>29... | 0950 | 669                     | 5.5                                          | 100                                      | 90                                               | 31                                            | 65                                         | 6.3                                                    | 174                                  | 0                                 | 340                                          | 6.5                                               |
| APR.<br>27... | 0730 | 110                     | 8.2                                          | 320                                      | 220                                              | 68                                            | 87                                         | 7.2                                                    | 203                                  | 0                                 | 820                                          | 6.1                                               |
| MAY<br>31...  | 1240 | 326                     | 12                                           | 30                                       | 130                                              | 46                                            | 55                                         | 7.9                                                    | 175                                  | 0                                 | 480                                          | 3.3                                               |
| JUNE<br>27... | 1525 | 224                     | 12                                           | 50                                       | 140                                              | 47                                            | 72                                         | 7.9                                                    | 167                                  | 0                                 | 560                                          | 5.0                                               |
| JULY<br>20... | 1105 | 98                      | 12                                           | 0                                        | 180                                              | 57                                            | 100                                        | 7.7                                                    | 147                                  | 0                                 | 770                                          | 5.0                                               |
| AUG.<br>23... | 1230 | 140                     | 8.7                                          | 110                                      | 190                                              | 55                                            | 69                                         | 8.1                                                    | 146                                  | 0                                 | 720                                          | 4.7                                               |
| SEP.<br>19... | 1250 | 36                      | 9.1                                          | 50                                       | 240                                              | 80                                            | 98                                         | 9.5                                                    | 186                                  | 0                                 | 970                                          | 6.0                                               |

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS) | DIS-<br>SOLVED<br>BERYL-<br>LIUM<br>(BE)<br>(UG/L) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L) | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L) |
|---------------|------|-------------------------|----------------------------------------------------|--------------------------------------------------|---------------------------------------------------|--------------------------------------------|------------------------------------------|
| OCT.<br>05... | 1330 | 201                     | 0                                                  | 0                                                | 0                                                 | 2                                          | 1                                        |
| JAN.<br>11... | 1245 | 35                      | 0                                                  | 1                                                | 0                                                 | 14                                         | 7                                        |
| APR.<br>27... | 0730 | 110                     | --                                                 | 1                                                | 0                                                 | 2                                          | 2                                        |

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS) | DIS-<br>SOLVED<br>AMMONIA<br>NITRO-<br>GEN<br>(N)<br>(MG/L) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L) | BIO-<br>CHEM-<br>ICAL<br>OXYGEN<br>DEMAND<br>(MG/L) | CYANIDE<br>(CN)<br>(MG/L) |
|---------------|------|-------------------------|-------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------|---------------------------|
| OCT.<br>05... | 1330 | 201                     | .11                                                         | .88                                       | .8                                                  | .00                       |
| JAN.<br>11... | 1245 | 35                      | .05                                                         | .28                                       | 1.3                                                 | .00                       |
| APR.<br>27... | 0730 | 110                     | .06                                                         | .25                                       | 4.2                                                 | .00                       |
| JULY<br>20... | 1105 | 98                      | --                                                          | --                                        | 1.8                                                 | --                        |

## PESTICIDES

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS) | ALDRIN<br>(UG/L) | CHLOR-<br>DANE<br>(UG/L) | DDD<br>(UG/L) | DDE<br>(UG/L) | DDT<br>(UG/L) | DI-<br>ELDRIN<br>(UG/L) |
|---------------|------|-------------------------|------------------|--------------------------|---------------|---------------|---------------|-------------------------|
| OCT.<br>05... | 1330 | 201                     | .00              | .0                       | .00           | .00           | .00           | .00                     |
| JAN.<br>11... | 1245 | 35                      | .00              | .0                       | .00           | .00           | .00           | .00                     |
| APR.<br>27... | 0730 | 110                     | .00              | .0                       | .00           | .00           | .00           | .00                     |

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

## EXTREMES.--1971-72:--Continued

Water temperatures: Maximum, 30.0°C Aug. 13; minimum, freezing point on many days during January to February.

## Period of record:

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

Water temperatures: Maximum, 30.0°C Aug. 13, 1972; minimum, freezing point on many days during winter period.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE       | DIS-SOLVED FLUORIDE (F) (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) (MG/L) | NON-CARBONATE HARDNESS (MG/L) | SODIUM ADSORPTION RATIO | SPECIFIC CONDUCTANCE (MICROMHOS) | PH (UNITS) | TEMPERATURE (DEG C) |
|------------|--------------------------------|---------------------------------|-----------------------------|------------------------------------------------|------------------------------------|----------------------------------|--------------------------|-------------------------------|-------------------------|----------------------------------|------------|---------------------|
| OCT. 05... | .6                             | 1.3                             | 140                         | 788                                            | 1.07                               | 428                              | 400                      | 360                           | 1.8                     | 1020                             | 7.3        | 10.5                |
| NOV. 16... | .8                             | .4                              | 150                         | 1420                                           | 1.93                               | 238                              | 910                      | 760                           | 1.2                     | 1750                             | 7.9        | 2.5                 |
| DEC. 14... | .9                             | .2                              | 200                         | 2070                                           | 2.82                               | 101                              | 1400                     | 1150                          | 1.3                     | 2370                             | 7.8        | .5                  |
| JAN. 11... | .9                             | .4                              | 200                         | 1960                                           | 2.67                               | 185                              | 1200                     | 955                           | 1.4                     | 2250                             | 7.9        | .0                  |
| FEB. 15... | .7                             | 1.0                             | 190                         | 1590                                           | 2.16                               | 129                              | 1000                     | 804                           | 1.1                     | 1890                             | 7.8        | .0                  |
| MAR. 29... | .5                             | .8                              | 100                         | 634                                            | .86                                | 1150                             | 350                      | 207                           | 1.5                     | 938                              | 7.8        | 2.5                 |
| APR. 27... | .6                             | .2                              | 130                         | 1320                                           | 1.80                               | 392                              | 820                      | 653                           | 1.3                     | 1630                             | 8.0        | 7.5                 |
| MAY 31...  | .7                             | .7                              | 140                         | 821                                            | 1.12                               | 723                              | 510                      | 366                           | 1.1                     | 1120                             | 7.7        | 18.5                |
| JUNE 27... | .8                             | 1.2                             | 170                         | 933                                            | 1.27                               | 564                              | 550                      | 413                           | 1.3                     | 1260                             | 7.7        | 22.0                |
| JULY 20... | .7                             | .6                              | 180                         | 1210                                           | 1.65                               | 320                              | 700                      | 579                           | 1.7                     | 1540                             | 8.0        | 16.0                |
| AUG. 23... | .7                             | .2                              | 150                         | 1120                                           | 1.52                               | 423                              | 700                      | 580                           | 1.1                     | 1430                             | 7.4        | 19.5                |
| SEP. 19... | .8                             | .1                              | 220                         | 1510                                           | 2.05                               | 147                              | 930                      | 777                           | 1.4                     | 1820                             | 7.8        | 17.5                |

| DATE       | DIS-SOLVED MANGANESE (MN) (UG/L) | DIS-SOLVED MOLYBDENUM (MO) (UG/L) | DIS-SOLVED NICKEL (NI) (UG/L) | DIS-SOLVED SILVER (AG) (UG/L) | DIS-SOLVED ZINC (ZN) (UG/L) | DIS-SOLVED SELENIUM (SE) (UG/L) | TOTAL MERCURY (HG) (UG/L) |
|------------|----------------------------------|-----------------------------------|-------------------------------|-------------------------------|-----------------------------|---------------------------------|---------------------------|
| OCT. 05... | 0                                | 3                                 | 4                             | 0                             | 10                          | 8                               | .3                        |
| JAN. 11... | 590                              | 0                                 | 22                            | 0                             | 20                          | 3                               | .4                        |
| APR. 27... | 40                               | 0                                 | 9                             | 0                             | 130                         | 12                              | .3                        |

## FIELD DETERMINATIONS

| DATE       | TIME | DISCHARGE (CFS) | DIS-SOLVED OXYGEN (MG/L) | PH (UNITS) | SPECIFIC CONDUCTANCE (MICROMHOS) | IMMEDIATE COLIFORM (COL. PER 100 ML) | FECAL COLIFORM (COL. PER 100 ML) |
|------------|------|-----------------|--------------------------|------------|----------------------------------|--------------------------------------|----------------------------------|
| OCT. 05... | 1330 | 201             | 9.7                      | 7.6        | 1100                             | --                                   | 2000                             |
| JAN. 11... | 1245 | 35              | 9.7                      | 7.5        | 2100                             | --                                   | 50                               |
| APR. 27... | 0730 | 110             | 10.6                     | 8.3        | 1500                             | --                                   | 31                               |
| JULY 20... | 1105 | 98              | 8.8                      | 8.1        | 1540                             | 570                                  | 260                              |

## PESTICIDES

| DATE       | ENDRIN (UG/L) | HEPTACHLOR (UG/L) | HEPTACHLOR EPOXIDE (UG/L) | LINDANE (UG/L) | 2,4-D (UG/L) | 2,4,5-T (UG/L) | SILVEX (UG/L) |
|------------|---------------|-------------------|---------------------------|----------------|--------------|----------------|---------------|
| OCT. 05... | .00           | .00               | .00                       | .00            | .00          | .00            | .00           |
| JAN. 11... | .00           | .00               | .00                       | .00            | .00          | .00            | .00           |
| APR. 27... | .00           | .00               | .00                       | .00            | .00          | .00            | .00           |

## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT   | NOV   | DEC   | JAN  | FEB   | MAR  | APR   | MAY  | JUN   | JUL   | AUG   | SEP  |
|-----|-------|-------|-------|------|-------|------|-------|------|-------|-------|-------|------|
| 1   | ---   | 1790  | 1950  | 2140 | 2250  | 983  | 900   | 1430 | 1160  | 1250  | 1470  | 1150 |
| 2   | 1260  | 1800  | 2170  | 2030 | 2270  | 773  | 983   | 1500 | 1230  | 1380  | 1650  | 1160 |
| 3   | 915   | 1760  | 2220  | 2120 | 2280  | ---  | 1110  | 1570 | 1220  | ---   | ---   | 1210 |
| 4   | 714   | 1840  | 2210  | 2190 | 2300  | 490  | 1230  | 1610 | 1250  | ---   | 1590  | 1300 |
| 5   | 1030  | 1870  | 2200  | 2240 | 2290  | 655  | 1300  | 1510 | 1310  | 1460  | 1680  | 1360 |
| 6   | 1190  | 1950  | 2070  | 2220 | 2410  | 653  | 1390  | 1390 | 1340  | 1460  | 1700  | 1440 |
| 7   | 1380  | 2020  | 1980  | 2240 | 2310  | 713  | 1460  | 1160 | 1360  | 1520  | 1680  | 1460 |
| 8   | 1440  | 2080  | 2000  | 2190 | 2180  | 797  | 1490  | 1080 | 1380  | 1530  | 1680  | 1540 |
| 9   | 964   | 2050  | 2080  | 2210 | 2170  | 508  | 1500  | 1220 | ---   | 1550  | 1670  | 1580 |
| 10  | 989   | 1840  | 2190  | 2080 | 2170  | ---  | 1480  | 1390 | 1470  | 1560  | 1700  | 1630 |
| 11  | 1060  | 2040  | 2230  | 2260 | 2160  | 720  | 1460  | 1330 | 1400  | 1660  | 1730  | 1650 |
| 12  | 1190  | 1830  | 2350  | 2230 | 2100  | 659  | 1500  | 1340 | ---   | 1580  | 1840  | 1660 |
| 13  | 1250  | 1720  | 2360  | 2250 | 2080  | 601  | 1530  | 1260 | 1120  | 1620  | 1790  | 1700 |
| 14  | ---   | 1750  | 2320  | 2380 | 1990  | 652  | 1530  | 1190 | 1270  | 1610  | 1780  | 1720 |
| 15  | 1440  | 1820  | 2380  | ---  | ---   | 705  | ---   | 1150 | 1240  | 1560  | 1870  | 1730 |
| 16  | 1390  | ---   | 2390  | ---  | 1850  | 767  | 1540  | 1190 | 1060  | 1670  | 1910  | 1760 |
| 17  | 1430  | 1820  | 2320  | ---  | 1040  | 824  | 1540  | 1080 | 1270  | 1670  | 1930  | 1790 |
| 18  | 1570  | 1800  | 2330  | ---  | 1140  | ---  | 1520  | 1210 | 906   | 1670  | ---   | 1810 |
| 19  | 1220  | 1850  | 2230  | ---  | 958   | 867  | 1520  | 1270 | 662   | 1520  | ---   | 1830 |
| 20  | 1450  | 1940  | 2230  | ---  | 961   | 888  | 1530  | 1240 | 886   | 1530  | 1240  | 1860 |
| 21  | 1480  | 1720  | ---   | ---  | 1020  | 907  | 1560  | 1510 | 1040  | 1540  | 1490  | 1870 |
| 22  | 1670  | 1600  | 2140  | ---  | 872   | 909  | ---   | 1150 | 1040  | 1540  | 1480  | 1890 |
| 23  | 1580  | 1790  | 2080  | ---  | 821   | 992  | 1550  | 921  | 992   | 1540  | 1400  | 1920 |
| 24  | ---   | 1840  | 2080  | 2180 | ---   | 1160 | 1570  | 1050 | 1040  | 1540  | ---   | 1940 |
| 25  | 1710  | 1910  | 2040  | 2190 | ---   | 1300 | 1580  | 1070 | 1120  | 1600  | 1170  | 1940 |
| 26  | 1740  | 1820  | 1650  | 2220 | ---   | 1230 | 1560  | 1180 | 1220  | ---   | 1100  | 1960 |
| 27  | 1690  | 1820  | 2140  | 2280 | 1050  | 994  | 1590  | 1340 | 1260  | 1490  | 1120  | 1960 |
| 28  | 1620  | 1880  | 2050  | 2280 | 1160  | 902  | 1610  | 1320 | 1350  | 1590  | 1130  | 1940 |
| 29  | 1650  | 1880  | 2150  | 1970 | 1140  | 945  | 1620  | 1440 | 1380  | 1550  | 1140  | 1930 |
| 30  | 1660  | 1880  | 2180  | 2250 | ---   | 905  | 1590  | 1180 | 1480  | 1440  | 1160  | 1770 |
| 31  | 1740  | ---   | 2180  | ---  | ---   | 898  | ---   | 1080 | ---   | 1560  | 1150  | ---  |
| AVG | C1370 | D1850 | E2160 | ---  | A1720 | C836 | C1460 | 1270 | C1190 | C1540 | B1530 | 1680 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN | FEB  | MAR  | APR   | MAY  | JUN   | JUL   | AUG   | SEP  |
|-----|------|------|------|-----|------|------|-------|------|-------|-------|-------|------|
| 1   | ---  | 4.0  | 1.0  | 0.0 | 0.0  | 2.5  | 7.5   | 6.5  | 20.0  | 26.0  | 26.0  | 19.5 |
| 2   | 4.0  | 4.0  | 1.0  | 0.0 | 0.0  | 1.5  | 6.0   | 8.0  | 21.0  | 24.0  | 19.0  | 19.5 |
| 3   | 6.0  | 4.0  | 1.0  | 0.0 | 0.0  | ---  | 7.5   | 11.0 | 22.0  | ---   | ---   | 21.0 |
| 4   | 9.0  | 6.0  | 1.0  | 0.0 | 0.0  | 2.0  | 9.0   | 14.0 | 23.0  | ---   | 23.5  | 22.0 |
| 5   | 8.5  | 2.5  | 1.0  | 0.0 | 0.0  | 2.0  | 11.0  | 18.5 | 23.0  | 27.5  | 24.0  | 22.0 |
| 6   | 14.0 | 1.0  | 1.0  | 0.0 | 0.0  | 2.0  | 12.0  | 13.0 | 23.0  | 24.0  | 25.0  | 20.0 |
| 7   | 12.5 | 1.0  | 1.0  | 0.0 | 0.0  | 2.0  | 14.0  | 11.0 | 24.5  | 24.5  | 25.0  | 20.5 |
| 8   | 11.0 | 2.0  | 1.0  | 0.0 | 0.0  | 3.0  | 12.5  | 9.5  | 25.0  | 25.5  | 27.0  | 21.0 |
| 9   | 10.0 | 2.0  | 1.0  | 0.0 | 0.0  | 2.5  | 12.5  | 9.5  | ---   | 27.0  | 26.0  | 23.0 |
| 10  | 13.5 | 2.0  | 1.0  | 0.0 | 0.0  | ---  | 12.0  | 9.5  | 24.0  | 26.0  | 26.0  | 20.5 |
| 11  | 13.0 | 2.0  | 1.0  | 0.0 | 0.0  | 6.5  | 14.0  | 11.0 | 26.0  | 26.0  | 27.0  | 20.5 |
| 12  | 13.0 | 3.0  | 1.0  | 0.0 | 0.0  | 5.0  | 14.5  | 11.5 | ---   | 26.0  | 29.0  | 20.5 |
| 13  | 12.0 | 3.0  | 1.0  | 0.0 | 0.0  | 5.0  | 11.0  | 14.0 | 24.0  | 26.5  | 30.0  | 20.5 |
| 14  | ---  | 6.0  | 1.0  | 0.0 | 0.0  | 7.0  | 14.0  | 17.0 | 24.0  | 25.0  | 28.0  | 19.5 |
| 15  | 7.5  | 7.0  | 1.0  | 0.0 | ---  | 8.0  | ---   | 19.0 | 23.0  | 24.0  | 27.0  | 19.5 |
| 16  | 6.0  | ---  | 1.0  | 0.0 | 0.0  | 9.0  | 15.0  | 21.0 | 22.0  | 24.5  | 29.0  | 19.5 |
| 17  | 7.5  | 1.0  | 1.0  | 0.0 | 0.0  | 9.5  | 12.0  | 22.0 | 18.0  | 23.0  | 25.0  | 20.5 |
| 18  | 9.0  | 1.0  | 1.0  | 0.0 | 0.0  | ---  | 9.0   | 21.5 | 13.0  | 26.0  | ---   | 20.5 |
| 19  | 9.0  | 1.0  | 1.0  | 0.0 | 0.0  | 10.0 | 10.0  | 21.0 | 14.0  | 24.0  | ---   | 18.5 |
| 20  | 9.0  | 1.0  | 1.0  | 0.0 | 0.0  | 10.0 | 10.5  | 21.0 | 15.0  | 21.0  | 24.5  | 15.0 |
| 21  | 10.0 | 4.0  | ---  | 0.0 | 0.0  | 10.5 | 14.0  | 21.0 | 18.0  | 24.0  | 22.0  | 16.5 |
| 22  | 10.0 | 4.0  | 1.0  | 0.0 | 1.0  | ---  | ---   | 21.0 | 20.0  | 25.0  | 24.0  | 17.0 |
| 23  | 10.0 | 2.0  | 1.0  | 0.0 | 1.0  | 10.0 | 13.0  | 20.5 | 22.0  | 27.0  | 22.0  | 16.5 |
| 24  | ---  | 3.0  | 1.0  | 0.0 | ---  | 10.3 | 12.0  | 20.5 | 24.0  | 24.0  | ---   | 15.5 |
| 25  | 11.0 | 3.0  | 1.0  | 0.0 | ---  | 9.0  | 14.0  | 21.0 | 22.0  | 25.0  | 22.0  | 10.5 |
| 26  | 12.0 | 3.0  | 1.0  | 0.0 | ---  | 8.0  | 10.0  | 21.0 | 22.0  | ---   | 23.0  | 10.5 |
| 27  | 6.0  | 1.0  | 1.0  | 0.0 | 2.0  | 4.0  | 10.0  | 17.0 | 22.0  | 24.5  | 24.0  | 9.0  |
| 28  | 3.5  | 1.0  | 1.0  | 0.0 | 2.0  | 5.5  | 12.0  | 16.0 | 22.0  | 27.0  | 25.0  | 11.5 |
| 29  | 1.0  | 1.0  | 1.0  | 0.0 | 2.0  | 5.5  | 14.0  | 16.0 | 25.0  | 28.0  | 24.5  | 13.5 |
| 30  | 1.0  | 1.0  | 1.0  | 0.0 | ---  | 5.0  | 10.0  | 21.0 | 25.0  | 25.0  | 23.5  | 13.5 |
| 31  | 1.0  | ---  | 1.0  | --- | ---  | 5.5  | ---   | 21.0 | ---   | 21.0  | 19.0  | ---  |
| AVG | C8.5 | D2.5 | E1.0 | 0.0 | A0.5 | C6.0 | C11.5 | 16.5 | C21.5 | C25.0 | B25.0 | 18.0 |

A Based on 25 days of data.

B Based on 27 days of data.

C Based on 28 days of data.

D Based on 29 days of data.

E Based on 30 days of data.



LOCATION.--Lat 44°34'26", long 104°02'54", in NW¼NW¼ sec.18, T.7 N., R.1 E., Butte County, S. Dak., at gaging station, 800 ft downstream from State line, 5.7 miles upstream from Crow Creek, and 12 miles southwest of Belle Fourche, S. Dak.

PERIOD OF RECORD.--Chemical analyses: May 1969 to June 1970.  
Sediment records: October 1971 to September 1972.

| DATE  | TIME | TEMPER-<br>ATURE<br>(DEG C) | DIS-<br>CHARGE<br>(CFS) | SUS-<br>PENDED<br>SEDI-<br>MENT<br>(MG/L) | SUS-<br>PENDED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY) |
|-------|------|-----------------------------|-------------------------|-------------------------------------------|--------------------------------------------------------------|
| OCT.  |      |                             |                         |                                           |                                                              |
| 05... | 1020 | 11.5                        | 44                      | 34                                        | 4.0                                                          |
| NOV.  |      |                             |                         |                                           |                                                              |
| 17... | 0950 | 5.5                         | 44                      | 24                                        | 2.9                                                          |
| DEC.  |      |                             |                         |                                           |                                                              |
| 15... | 0850 | 3.0                         | 40                      | 24                                        | 2.6                                                          |
| JAN.  |      |                             |                         |                                           |                                                              |
| 11... | 1630 | 2.0                         | 41                      | 14                                        | 1.5                                                          |
| FEB.  |      |                             |                         |                                           |                                                              |
| 16... | 1105 | 5.5                         | 40                      | 74                                        | 8.0                                                          |
| MAR.  |      |                             |                         |                                           |                                                              |
| 29... | 1140 | 6.0                         | 40                      | 50                                        | 5.4                                                          |
| APR.  |      |                             |                         |                                           |                                                              |
| 26... | 1600 | --                          | 46                      | 76                                        | 9.4                                                          |
| MAY   |      |                             |                         |                                           |                                                              |
| 31... | 1500 | 17.0                        | 94                      | 246                                       | 62                                                           |
| JUNE  |      |                             |                         |                                           |                                                              |
| 27... | 1700 | 18.0                        | 65                      | 168                                       | 29                                                           |
| JULY  |      |                             |                         |                                           |                                                              |
| 20... | 1010 | 13.0                        | 50                      | 102                                       | 14                                                           |
| AUG.  |      |                             |                         |                                           |                                                              |
| 23... | 1430 | 15.5                        | 52                      | 70                                        | 9.8                                                          |
| SEP.  |      |                             |                         |                                           |                                                              |
| 22... | 1440 | 13.5                        | 49                      | 16                                        | 2.1                                                          |

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C) | DIS-<br>CHARGE<br>(CFS) | NUMBER<br>OF<br>SAM-<br>PLING<br>POINTS | BED<br>MAT.<br>FALL<br>DIAM. | BED<br>MAT.<br>FALL<br>DIAM. | BED<br>MAT.<br>FALL<br>DIAM. |
|---------------|------|-----------------------------|-------------------------|-----------------------------------------|------------------------------|------------------------------|------------------------------|
|               |      |                             |                         |                                         | % FINER<br>THAN<br>.062 MM   | % FINER<br>THAN<br>.125 MM   | % FINER<br>THAN<br>.250 MM   |
| AUG.<br>23... | 1430 | 15.5                        | 52                      | 14                                      | 4                            | 6                            | 8                            |
|               |      |                             |                         |                                         | BED<br>MAT.<br>FALL<br>DIAM. | BED<br>MAT.<br>FALL<br>DIAM. | BED<br>MAT.<br>FALL<br>DIAM. |
|               |      |                             |                         |                                         | % FINER<br>THAN<br>.500 MM   | % FINER<br>THAN<br>1.00 MM   | % FINER<br>THAN<br>2.00 MM   |
|               |      |                             |                         |                                         | % FINER<br>THAN<br>4.00 MM   | % FINER<br>THAN<br>8.00 MM   | % FINER<br>THAN<br>16.0 MM   |
|               |      |                             |                         |                                         | % FINER<br>THAN<br>32.0 MM   |                              |                              |
| AUG.<br>23... | 12   | 16                          | 19                      | 22                                      | 28                           | 37                           | 63                           |

## 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 1972.

Water temperatures: October 1968 to September 1972.

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 1,180 mg/l Feb. 1-29; minimum, 589 mg/l Mar. 1-9, 21-23.

Hardness: Maximum, 900 mg/l Feb. 1-29; minimum, 360 mg/l Mar. 1-9, 21-23, June 7-30.

Specific conductance: Maximum daily, 1,950 micromhos Feb. 15; minimum daily, 550 micromhos June 19.

Water temperatures: Maximum, 22.0°C on several days during June to August; minimum, freezing point on many days during December to March.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 358                                        | 8.5                                                     | 140                                                         | 40                                                       | 42                                                    | 4.7                                                               | 178                                             | 460                                                     | 4.4                                                          | .4                                                          | .58                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 209                                        | 9.1                                                     | 200                                                         | 51                                                       | 35                                                    | 5.6                                                               | 225                                             | 580                                                     | 5.0                                                          | .4                                                          | .28                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 185                                        | 11                                                      | 200                                                         | 53                                                       | 31                                                    | 3.6                                                               | 217                                             | 590                                                     | 3.0                                                          | .5                                                          | .47                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 194                                        | 15                                                      | 210                                                         | 56                                                       | 26                                                    | 3.8                                                               | 225                                             | 610                                                     | 3.3                                                          | .5                                                          | .64                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 271                                        | 17                                                      | 260                                                         | 61                                                       | 21                                                    | 3.9                                                               | 252                                             | 680                                                     | 3.4                                                          | .4                                                          | 1.1                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-09               | --   | 488                                        | 5.0                                                     | 100                                                         | 28                                                       | 36                                                    | 6.6                                                               | 156                                             | 330                                                     | 3.9                                                          | .4                                                          | .41                                                                      |
| 21-23               | --   | 36                                         | 5.0                                                     | 100                                                         | 28                                                       | 36                                                    | 6.6                                                               | 156                                             | 330                                                     | 3.9                                                          | .4                                                          | .41                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 06-30               | --   | 102                                        | 10                                                      | 99                                                          | 27                                                       | 66                                                    | 6.8                                                               | 146                                             | 420                                                     | 3.7                                                          | 1.2                                                         | .42                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 242                                        | 11                                                      | 180                                                         | 53                                                       | 40                                                    | 5.5                                                               | 216                                             | 600                                                     | 3.5                                                          | .4                                                          | .12                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 252                                        | 11                                                      | 180                                                         | 48                                                       | 38                                                    | 4.9                                                               | 208                                             | 570                                                     | 4.0                                                          | .4                                                          | .38                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 207                                        | 11                                                      | 180                                                         | 49                                                       | 29                                                    | 3.9                                                               | 227                                             | 520                                                     | 4.9                                                          | .4                                                          | .21                                                                      |
| WTD. AVG.           | --   | --                                         | 11                                                      | 181                                                         | 48                                                       | 35                                                    | 4.8                                                               | 209                                             | 548                                                     | 4.0                                                          | .4                                                          | .48                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                          |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | A234                                       | 11                                                      | 181                                                         | 48                                                       | 36                                                    | 4.8                                                               | 209                                             | 552                                                     | 3.9                                                          | .5                                                          | .46                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 1950                                                    | 31900                                                       | 8510                                                     | 6170                                                  | 841                                                               | 36900                                           | 96800                                                   | 698                                                          | 79                                                          | 85                                                                       |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |      |    |     |    |    |     |     |     |     |    |     |
|-------|------|------|----|-----|----|----|-----|-----|-----|-----|----|-----|
| JAN.  |      |      |    |     |    |    |     |     |     |     |    |     |
| 05... | 1400 | 190  | 12 | 240 | 54 | 19 | 3.5 | 261 | 600 | 3.6 | .4 | .54 |
| AUG.  |      |      |    |     |    |    |     |     |     |     |    |     |
| 04... | 1500 | B289 | 11 | 190 | 51 | 30 | 4.4 | 252 | 560 | 3.7 | .5 | .27 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

A Mean discharge based on 280 days of chemical analysis; mean discharge for 365 days, 180 cfs.

B Discharge at time of sampling.

## CHEYENNE RIVER BASIN

53

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1968-69, 1970-72): Maximum, 1,180 mg/l Feb. 1-29, 1972; minimum, 536 mg/l Feb. 1-28, 1971.

Hardness (1968-69, 1971-72): Maximum, 780 mg/l Oct. 1-31, 1968; minimum, 360 mg/l Feb. 1-28, 1971, Mar. 1-9, 21-23, June 7-30, 1972.

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. Additional samples collected for more comprehensive definition of water quality. No flow Mar. 10-20, Mar. 24 to Apr. 18, Apr. 21 to May 9, May 13 to June 5, June 20.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | --                                                                  | .060                                                 | 110                                                 | 790                                                                            | 1.07                                                          | 764                                                         | 510                                  | 370                                                          | .8                                                 | 1100                                                                  | 7.9                      | --                                     |
| NOV.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30               | --                                                                  | --                                                   | 110                                                 | 998                                                                            | 1.36                                                          | 563                                                         | 710                                  | 520                                                          | .6                                                 | 1310                                                                  | 8.0                      | --                                     |
| DEC.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .010                                                                | .080                                                 | 30                                                  | 1000                                                                           | 1.36                                                          | 499                                                         | 720                                  | 540                                                          | .5                                                 | 1290                                                                  | 7.6                      | --                                     |
| JAN.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .010                                                                | .030                                                 | 100                                                 | 1040                                                                           | 1.41                                                          | 545                                                         | 750                                  | 570                                                          | .4                                                 | 1340                                                                  | 7.7                      | --                                     |
| FEB.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-29               | .10                                                                 | .10                                                  | 100                                                 | 1180                                                                           | 1.60                                                          | 863                                                         | 900                                  | 690                                                          | .3                                                 | 1460                                                                  | 7.8                      | --                                     |
| MAR.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-09               | .030                                                                | .040                                                 | 90                                                  | 589                                                                            | .80                                                           | 776                                                         | 360                                  | 240                                                          | .8                                                 | 850                                                                   | 8.1                      | --                                     |
| 21-23               | .030                                                                | .040                                                 | 90                                                  | 589                                                                            | .80                                                           | 57.3                                                        | 360                                  | 240                                                          | .8                                                 | 850                                                                   | 8.1                      | --                                     |
| JUNE                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 06-30               | .060                                                                | .080                                                 | 150                                                 | 708                                                                            | .96                                                           | 195                                                         | 360                                  | 240                                                          | 1.5                                                | 963                                                                   | 8.1                      | --                                     |
| JULY                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .040                                                                | .050                                                 | 150                                                 | 1000                                                                           | 1.36                                                          | 653                                                         | 670                                  | 490                                                          | .7                                                 | 1320                                                                  | 8.2                      | --                                     |
| AUG.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .040                                                                | .050                                                 | 130                                                 | 960                                                                            | 1.31                                                          | 653                                                         | 650                                  | 480                                                          | .7                                                 | 1273                                                                  | 8.0                      | --                                     |
| SEP.                |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30               | .040                                                                | .040                                                 | 110                                                 | 911                                                                            | 1.24                                                          | 509                                                         | 650                                  | 460                                                          | .5                                                 | 1200                                                                  | 8.1                      | --                                     |
| WTD. AVG.           | C.043                                                               | D.059                                                | 108                                                 | 937                                                                            | 1.27                                                          | --                                                          | 649                                  | 478                                                          | .6                                                 | 1230                                                                  | 7.9                      | --                                     |
| TIME WTD.           |                                                                     |                                                      |                                                     |                                                                                |                                                               |                                                             |                                      |                                                              |                                                    |                                                                       |                          |                                        |
| AVG.                | C.042                                                               | D.060                                                | 108                                                 | 943                                                                            | 1.28                                                          | --                                                          | 651                                  | 479                                                          | .7                                                 | 1240                                                                  | 7.9                      | --                                     |
| TOT. LOAD<br>(TONS) | C5.5                                                                | D9.4                                                 | 19                                                  | 166000                                                                         | --                                                            | --                                                          | --                                   | --                                                           | --                                                 | --                                                                    | --                       | --                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |      |     |      |      |     |     |     |    |      |     |      |
|-------|------|------|-----|------|------|-----|-----|-----|----|------|-----|------|
| JAN.  |      |      |     |      |      |     |     |     |    |      |     |      |
| 05... | --   | .040 | 100 | 1060 | 1.44 | 544 | 820 | 610 | .3 | 1370 | 7.6 | .0   |
| AUG.  |      |      |     |      |      |     |     |     |    |      |     |      |
| 04... | .030 | .26  | 140 | 976  | 1.33 | 762 | 680 | 480 | .5 | 1290 | 7.9 | 20.0 |

C Based on 301 days of chemical analysis.

D Based on 335 days of chemical analysis.

## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN  | FEB   | MAR | APR  | MAY | JUN  | JUL  | AUG  | SEP  |
|-----|------|------|------|------|-------|-----|------|-----|------|------|------|------|
| 1   | 1270 | 1260 | 1250 | 1230 | 1640  | 810 | ---  | --- | ---  | 1250 | 1350 | 1210 |
| 2   | 1040 | 1290 | 1150 | 1390 | 1420  | 830 | ---  | --- | ---  | 1140 | 1310 | 1210 |
| 3   | 935  | 1230 | 1280 | 1510 | 1700  | 720 | ---  | --- | ---  | 1160 | 1230 | 1210 |
| 4   | 818  | 1280 | 1300 | 1340 | 1480  | 830 | ---  | --- | ---  | 1160 | 1250 | 1240 |
| 5   | 877  | 1320 | 1450 | 1380 | 1420  | 830 | ---  | --- | ---  | 1220 | 1220 | 1220 |
| 6   | 999  | 1040 | 1460 | 1400 | 1420  | 820 | ---  | --- | ---  | 1210 | 1270 | 1240 |
| 7   | 1060 | 1170 | 1380 | 1470 | 1580  | 820 | ---  | --- | 1120 | 1220 | 1250 | 1250 |
| 8   | 1160 | 1200 | 1370 | 1370 | 1740  | --- | ---  | --- | 1140 | 1240 | 1250 | 1250 |
| 9   | 1000 | 1240 | 1350 | 1340 | 1850  | --- | ---  | --- | 1160 | 1190 | 1250 | 1260 |
| 10  | 986  | 1300 | 1310 | 1400 | 1280  | --- | ---  | --- | 1000 | 1230 | 1270 | 1280 |
| 11  | 1030 | 1310 | 1310 | 1390 | 1880  | --- | ---  | --- | 1040 | 1250 | 1290 | 1300 |
| 12  | 1040 | 1320 | 1300 | 1380 | 1300  | --- | ---  | --- | 1040 | 1240 | 1290 | 1290 |
| 13  | 1080 | 1290 | 1310 | 1360 | 1880  | --- | ---  | --- | 1120 | 1270 | 1330 | 1280 |
| 14  | 1140 | 1230 | 1300 | 1380 | 1850  | --- | ---  | --- | 1090 | 1280 | 1350 | 1290 |
| 15  | 1150 | 1280 | 1400 | 1450 | 1950  | --- | ---  | --- | 1100 | 1330 | 1390 | 1290 |
| 16  | 1220 | 1320 | 1300 | 1360 | ---   | --- | ---  | --- | 1100 | 1330 | 1450 | 1290 |
| 17  | 1200 | 1280 | 1300 | 1380 | 1800  | --- | ---  | --- | 980  | 1320 | 1450 | 1320 |
| 18  | 1110 | 1270 | 1290 | 1400 | 1120  | --- | ---  | --- | 990  | 1330 | 1100 | 1290 |
| 19  | 1230 | 1290 | 1300 | 1400 | 1020  | --- | ---  | --- | 550  | 1440 | 1470 | 1330 |
| 20  | 1070 | 1360 | 1120 | 1420 | 1080  | --- | 1260 | --- | ---  | 1370 | 1320 | 1320 |
| 21  | 1220 | 1350 | 1340 | 1400 | 960   | --- | ---  | --- | 780  | 1360 | 1250 | 1400 |
| 22  | 1200 | 1350 | 1290 | 1380 | ---   | --- | ---  | --- | 820  | 1350 | 1240 | 1340 |
| 23  | 1290 | 1360 | 1300 | 1400 | ---   | --- | ---  | --- | 860  | 1350 | 1220 | 1310 |
| 24  | 1250 | 1340 | 1320 | 1410 | ---   | --- | ---  | --- | 820  | 1330 | 1210 | 1310 |
| 25  | 1270 | 1370 | 1360 | 1420 | 1140  | --- | ---  | --- | 860  | 1300 | 1110 | 1330 |
| 26  | 1290 | 1380 | 1490 | 1450 | 1080  | --- | ---  | --- | 930  | 1290 | 1110 | 1300 |
| 27  | 1270 | 1360 | 1480 | 1400 | 1140  | --- | ---  | --- | 800  | 1430 | 1120 | 1230 |
| 28  | 1200 | 1370 | 1380 | 1430 | ---   | --- | ---  | --- | 810  | 1360 | 1100 | 1330 |
| 29  | 1180 | 1340 | 1330 | 1420 | ---   | --- | ---  | --- | 890  | 1360 | 1100 | 1310 |
| 30  | 1200 | 1310 | 1310 | 1410 | ---   | --- | ---  | --- | 1200 | 1290 | 1120 | 1560 |
| 31  | 1170 | ---  | 1290 | 1400 | ---   | --- | ---  | --- | ---  | 1290 | 1110 | ---  |
| AVG | 1130 | 1290 | 1330 | 1400 | E1470 | --- | ---  | --- | ---  | 1290 | 1250 | 1290 |

E Based on 23 days of data.

## CHEYENNE RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN  | JUL  | AUG  | SEP  |
|-----|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|
| 1   | 14.0 | 3.0 | 1.0 | 0.0 | 0.0 | 3.0 | --- | --- | ---  | 22.0 | 17.0 | 19.0 |
| 2   | 4.0  | 4.0 | 1.0 | 0.0 | 0.0 | 3.0 | --- | --- | ---  | 15.0 | 19.0 | 17.0 |
| 3   | 6.0  | 5.0 | 0.0 | 0.0 | 0.0 | 4.0 | --- | --- | ---  | 18.0 | 16.0 | 15.0 |
| 4   | 6.0  | 6.0 | 1.0 | 0.0 | 0.0 | 2.0 | --- | --- | ---  | 20.0 | 17.0 | 17.0 |
| 5   | 8.0  | 3.0 | 0.0 | 0.0 | 0.0 | 2.0 | --- | --- | ---  | 18.0 | 20.0 | 19.0 |
| 6   | 10.0 | 3.0 | 2.0 | 0.0 | 0.0 | 3.0 | --- | --- | ---  | 20.0 | 20.0 | 19.0 |
| 7   | 12.0 | 1.0 | 1.0 | 0.0 | 0.0 | 0.0 | --- | --- | ---  | 19.0 | 19.0 | 18.0 |
| 8   | 11.0 | 1.0 | 0.0 | 1.0 | 0.0 | --- | --- | --- | 21.0 | 22.0 | 18.0 | 15.0 |
| 9   | 7.0  | 2.0 | 1.0 | 0.0 | 0.0 | --- | --- | --- | 20.0 | 20.0 | 19.0 | 17.0 |
| 10  | 10.0 | 1.0 | 2.0 | 1.0 | 0.0 | --- | --- | --- | 18.0 | 21.0 | 21.0 | 15.0 |
| 11  | 10.0 | 3.0 | 1.0 | 0.0 | 0.0 | --- | --- | --- | 19.0 | 22.0 | 21.0 | 16.0 |
| 12  | 9.0  | 4.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | 21.0 | 19.0 | 20.0 | 15.0 |
| 13  | 7.0  | 4.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | 18.0 | 22.0 | 21.0 | 17.0 |
| 14  | 10.0 | 5.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | 20.0 | 22.0 | 21.0 | 17.0 |
| 15  | 9.0  | 5.0 | 1.0 | 0.0 | 0.0 | --- | --- | --- | 19.0 | 20.0 | 22.0 | 18.0 |
| 16  | 7.0  | 5.0 | 0.0 | 0.0 | 0.0 | --- | --- | --- | 20.0 | 19.0 | 22.0 | 13.0 |
| 17  | 7.0  | 3.0 | 1.0 | 0.0 | 0.0 | --- | --- | --- | 21.0 | 18.0 | 21.0 | 15.0 |
| 18  | 9.0  | 2.0 | 1.0 | 0.0 | 1.0 | --- | --- | --- | 20.0 | 18.0 | 20.0 | 15.0 |
| 19  | 8.0  | 1.0 | 0.0 | 0.0 | 3.0 | --- | --- | --- | 15.0 | 18.0 | 21.0 | 15.0 |
| 20  | 8.0  | 3.0 | 0.0 | 0.0 | 3.0 | --- | 7.0 | --- | ---  | 19.0 | 20.0 | 16.0 |
| 21  | 7.0  | 4.0 | 0.0 | 0.0 | 4.0 | --- | --- | --- | 18.0 | 20.0 | 18.0 | 15.0 |
| 22  | 8.0  | 5.0 | 1.0 | 1.0 | 3.0 | --- | --- | --- | 18.0 | 20.0 | 19.0 | 12.0 |
| 23  | 6.0  | 3.0 | 1.0 | 0.0 | 2.0 | --- | --- | --- | 21.0 | 21.0 | 18.0 | 12.0 |
| 24  | 9.0  | 3.0 | 1.0 | 0.0 | 3.0 | --- | --- | --- | 22.0 | 20.0 | 17.0 | 10.0 |
| 25  | 9.0  | 3.0 | 2.0 | 0.0 | 1.0 | --- | --- | --- | 20.0 | 20.0 | 20.0 | 10.0 |
| 26  | 8.0  | 2.0 | 0.0 | 0.0 | 3.0 | --- | --- | --- | 19.0 | 18.0 | 20.0 | 6.0  |
| 27  | 7.0  | 2.0 | 0.0 | 0.0 | 2.0 | --- | --- | --- | 18.0 | 19.0 | 19.0 | 8.0  |
| 28  | 6.0  | 4.0 | 1.0 | 0.0 | 2.0 | --- | --- | --- | 21.0 | 20.0 | 19.0 | 7.0  |
| 29  | 5.0  | 2.0 | 0.0 | 0.0 | 3.0 | --- | --- | --- | 20.0 | 21.0 | 20.0 | 7.0  |
| 30  | 0.0  | 3.0 | 0.0 | 0.0 | --- | --- | --- | --- | 21.0 | 21.0 | 19.0 | 8.0  |
| 31  | 3.0  | --- | 0.0 | 0.0 | --- | --- | --- | --- | ---  | 20.0 | 20.0 | ---  |
| AVG | 7.5  | 3.0 | 0.5 | 0.0 | 1.0 | --- | --- | --- | ---  | 19.5 | 19.5 | 14.0 |

## 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 4.0 miles northeast of Vale.

DRAINAGE AREA.--530 sq mi, approximately.

PERIOD OF RECORD.--August 1964 to September 1968 (monthly), October 1968 to September 1972 (daily).  
Water temperatures: October 1968 to September 1972.

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 4,870 mg/l Jan. 1-31; minimum, 660 mg/l Oct. 1-31.

Hardness: Maximum, 2,200 mg/l Jan. 1-31; minimum, 310 mg/l Oct. 1-31.

Specific conductance: Maximum daily, 7,350 micromhos Apr. 29; minimum daily, 626 micromhos Oct. 5.

Water temperatures: Maximum, 28.0°C June 8, 9, 11, July 13, Aug. 12; minimum, freezing point on many days during December to March.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>TAS-<br>SODIUM<br>(NA)<br>(MG/L)<br>(00935) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 244                                        | 7.7                                                     | 70                                                          | 33                                                                 | 88                                                            | 5.8                                                               | 110                                             | 380                                                     | 15                                                           | .5                                                          | 1.3                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 10                                         | 7.1                                                     | 210                                                         | 170                                                                | 410                                                           | 9.2                                                               | 279                                             | 1700                                                    | 67                                                           | .4                                                          | 5.9                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 6.3                                        | 8.2                                                     | 290                                                         | 260                                                                | 610                                                           | 11                                                                | 400                                             | 2600                                                    | 93                                                           | .5                                                          | 4.2                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 3.4                                        | 11                                                      | 360                                                         | 310                                                                | 660                                                           | 12                                                                | 370                                             | 3200                                                    | 120                                                          | .8                                                          | 2.3                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 36                                         | 7.6                                                     | 240                                                         | 170                                                                | 380                                                           | 13                                                                | 300                                             | 1800                                                    | 72                                                           | .4                                                          | 3.5                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 264                                        | 6.3                                                     | 86                                                          | 53                                                                 | 140                                                           | 5.8                                                               | 127                                             | 590                                                     | 21                                                           | .4                                                          | 1.8                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 9.5                                        | 2.8                                                     | 230                                                         | 250                                                                | 590                                                           | 6.5                                                               | 281                                             | 2400                                                    | 110                                                          | .5                                                          | 14                                                                       |
| MAY                 |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 108                                        | 7.0                                                     | 130                                                         | 86                                                                 | 230                                                           | 9.2                                                               | 164                                             | 960                                                     | 43                                                           | .5                                                          | 5.0                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 120                                        | 6.4                                                     | 150                                                         | 77                                                                 | 160                                                           | 8.5                                                               | 162                                             | 860                                                     | 29                                                           | .6                                                          | 2.9                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 100                                        | 6.8                                                     | 190                                                         | 91                                                                 | 140                                                           | 9.3                                                               | 200                                             | 920                                                     | 21                                                           | .6                                                          | 1.1                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 123                                        | 7.5                                                     | 200                                                         | 94                                                                 | 150                                                           | 9.5                                                               | 206                                             | 980                                                     | 22                                                           | .6                                                          | 1.1                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                                    |                                                               |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 84                                         | 5.1                                                     | 200                                                         | 98                                                                 | 140                                                           | 8.9                                                               | 208                                             | 1000                                                    | 21                                                           | 1.1                                                         | .96                                                                      |
| WTD. AVG.           | --   | --                                         | 6.8                                                     | 133                                                         | 74                                                                 | 158                                                           | 7.7                                                               | 162                                             | 794                                                     | 26                                                           | .5                                                          | 2.1                                                                      |
| TIME WTD.           | --   | 93                                         | 7.0                                                     | 196                                                         | 141                                                                | 308                                                           | 9.0                                                               | 234                                             | 1450                                                    | 53                                                           | .6                                                          | 3.6                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 628                                                     | 12300                                                       | 6800                                                               | 14600                                                         | 707                                                               | 14900                                           | 73000                                                   | 2410                                                         | 50                                                          | 195                                                                      |

## ANALYSES OF ADDITIONAL SAMPLES

|       |       |     |     |     |     |     |     |     |      |     |    |     |
|-------|-------|-----|-----|-----|-----|-----|-----|-----|------|-----|----|-----|
| JAN.  |       |     |     |     |     |     |     |     |      |     |    |     |
| 04... | A1005 | 3.1 | 8.2 | 410 | 340 | 800 | 13  | 561 | 3500 | 150 | .8 | 8.7 |
| APR.  |       |     |     |     |     |     |     |     |      |     |    |     |
| 04... | A1015 | 16  | 4.1 | 190 | 170 | 420 | 8.3 | 248 | 1700 | 75  | .4 | 6.6 |
| AUG.  |       |     |     |     |     |     |     |     |      |     |    |     |
| 02... | A1300 | 192 | 8.0 | 180 | 83  | 120 | 8.2 | 197 | 840  | 18  | .5 | .98 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.  
A Discharge at time of sampling.



## CHEYENNE RIVER BASIN

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1968-69, 1970-72): Maximum, 8,350 mg/l Jan. 1 to Feb. 28, 1969; minimum, 290 mg/l Feb. 1-28, 1971.

Hardness (1968-69, 1970-72): Maximum, 3,360 mg/l Jan. 1 to Feb. 28, 1969; minimum, 190 mg/l Feb. 1-28, 1971.

Specific conductance (1968-69, 1971-72): Maximum daily, 8,080 micromhos Feb. 1-3, 1969; minimum daily, 626 micromhos Oct. 5, 1972.

Water temperatures (1968-69, 1971-72): 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, 5,540 mg/l Jan. 4; hardness, 2,400 mg/l Jan. 4. 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 1971 TO SEPTEMBER 1972

| DATE                | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| UCT.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | --                                                                  | .040                                                 | 170                                                 | 660                                                                       | .90                                                           | 435                                                         | 310                                            | 220                                                          | 2.2                                                | 973                                                                   | 7.7                      | --                                     |
| NOV.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30               | --                                                                  | .12                                                  | 480                                                 | 2740                                                                      | 3.73                                                          | 74.0                                                        | 1200                                           | 990                                                          | 5.1                                                | 3360                                                                  | 7.9                      | --                                     |
| DEC.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .030                                                                | .070                                                 | 290                                                 | 4090                                                                      | 5.56                                                          | 69.6                                                        | 1800                                           | 1500                                                         | 6.3                                                | 4670                                                                  | 7.9                      | --                                     |
| JAN.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .020                                                                | .030                                                 | 1100                                                | 4870                                                                      | 6.62                                                          | 44.7                                                        | 2200                                           | 1900                                                         | 6.2                                                | 5410                                                                  | 7.9                      | --                                     |
| FEB.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-29               | .17                                                                 | .18                                                  | 600                                                 | 2850                                                                      | 3.88                                                          | 277                                                         | 1300                                           | 1100                                                         | 4.6                                                | 3490                                                                  | 7.8                      | --                                     |
| MAR.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .020                                                                | .56                                                  | 190                                                 | 973                                                                       | 1.32                                                          | 694                                                         | 430                                            | 330                                                          | 2.9                                                | 1390                                                                  | 7.8                      | --                                     |
| APR.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30               | .030                                                                | .040                                                 | 630                                                 | 3790                                                                      | 5.15                                                          | 97.2                                                        | 1600                                           | 1400                                                         | 6.4                                                | 4440                                                                  | 8.3                      | --                                     |
| MAY                 |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .050                                                                | .060                                                 | 300                                                 | 1570                                                                      | 2.14                                                          | 458                                                         | 580                                            | 540                                                          | 3.8                                                | 2140                                                                  | 7.8                      | --                                     |
| JUNE                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30               | .040                                                                | .050                                                 | 300                                                 | 1390                                                                      | 1.89                                                          | 450                                                         | 690                                            | 560                                                          | 2.6                                                | 1810                                                                  | 8.1                      | --                                     |
| JULY                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .050                                                                | .060                                                 | 300                                                 | 1480                                                                      | 2.01                                                          | 400                                                         | 850                                            | 680                                                          | 2.1                                                | 1930                                                                  | 8.0                      | --                                     |
| AUG.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-31               | .050                                                                | .050                                                 | 330                                                 | 1570                                                                      | 2.14                                                          | 521                                                         | 890                                            | 720                                                          | 2.2                                                | 2010                                                                  | 8.0                      | --                                     |
| SEP.                |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| 01-30               | .040                                                                | .040                                                 | 330                                                 | 1580                                                                      | 2.15                                                          | 358                                                         | 900                                            | 730                                                          | 2.0                                                | 2020                                                                  | 8.1                      | --                                     |
| WTD. AVG.           | B.043                                                               | .17                                                  | 266                                                 | 1290                                                                      | 1.76                                                          | --                                                          | 636                                            | 506                                                          | 2.7                                                | 1720                                                                  | 7.9                      | --                                     |
| TIME WTD.           |                                                                     |                                                      |                                                     |                                                                           |                                                               |                                                             |                                                |                                                              |                                                    |                                                                       |                          |                                        |
| AVG.                | B.050                                                               | .10                                                  | 417                                                 | 2290                                                                      | 3.12                                                          | --                                                          | 1070                                           | 888                                                          | 3.9                                                | 2800                                                                  | 7.9                      | --                                     |
| TOT. LOAD<br>(TONS) | B3.0                                                                | 16                                                   | 24                                                  | 119000                                                                    | --                                                            | --                                                          | --                                             | --                                                           | --                                                 | --                                                                    | --                       | --                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |      |      |      |      |      |      |      |     |      |     |      |
|-------|------|------|------|------|------|------|------|------|-----|------|-----|------|
| JAN.  |      |      |      |      |      |      |      |      |     |      |     |      |
| 04... | --   | .070 | 1100 | 5540 | 7.53 | 46.4 | 2400 | 2000 | 7.1 | 6250 | 7.7 | .0   |
| APR.  |      |      |      |      |      |      |      |      |     |      |     |      |
| 04... | .020 | .11  | 440  | 2720 | 3.70 | 123  | 1200 | 970  | 5.3 | 3380 | 7.9 | 5.5  |
| AUG.  |      |      |      |      |      |      |      |      |     |      |     |      |
| 02... | .030 | .30  | 310  | 1360 | 1.85 | 705  | 790  | 630  | 1.9 | 1790 | 7.8 | 20.0 |

B Based on 301 days of chemical analysis.

## CHEYENNE RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT   | NOV  | DEC  | JAN   | FEB   | MAR  | APR  | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|-------|------|------|-------|-------|------|------|------|------|------|------|------|
| 1   | 2690  | ---  | 3300 | 5600  | 4350  | 700  | 2780 | 6710 | 1960 | 1620 | 1770 | 2120 |
| 2   | 756   | ---  | 4600 | 5600  | 4700  | 720  | 2300 | 6420 | 2270 | 1710 | 1730 | 1940 |
| 3   | 716   | ---  | 3380 | 5600  | 4400  | 680  | 3280 | 5570 | 2470 | 1570 | 1700 | 1920 |
| 4   | 740   | ---  | 4500 | 5600  | 4600  | 720  | 3130 | 5650 | 1750 | 1700 | 1850 | 1870 |
| 5   | 626   | ---  | 3350 | 5600  | 4350  | 760  | 3050 | 5590 | 1750 | 1700 | 1840 | 1930 |
| 6   | 780   | ---  | 3300 | 5600  | 4750  | 750  | 3470 | 5580 | 2320 | 1590 | 2000 | 1990 |
| 7   | 1070  | ---  | 4400 | 5600  | 4700  | 1060 | 3680 | 5500 | 2200 | 1700 | 1920 | 1960 |
| 8   | 1190  | 5300 | 3900 | 6000  | 4600  | 730  | 3660 | 5520 | 2320 | 2140 | 2140 | 2160 |
| 9   | 1370  | 4980 | 4000 | 5600  | 4800  | 720  | 3610 | 5570 | 3750 | 1820 | 2160 | 2060 |
| 10  | 1620  | 5340 | 4600 | 5700  | 4700  | 660  | 3860 | 6250 | 1880 | 1820 | 2070 | 2060 |
| 11  | 1980  | 5350 | 4600 | 5700  | 4800  | 670  | 4240 | 5390 | 3760 | 2560 | 2100 | 2020 |
| 12  | 1990  | 5020 | 5200 | 5700  | 4600  | 960  | 4890 | 1730 | 1880 | 2690 | 2150 | 2140 |
| 13  | 2680  | 5020 | 4500 | 5800  | 4400  | 850  | 5080 | 1840 | 1610 | 2110 | 2170 | 2140 |
| 14  | 2340  | 5010 | 5200 | 5700  | 4800  | 950  | 5140 | 1290 | 1530 | 2700 | 2210 | 2130 |
| 15  | 2680  | 5200 | 4600 | 5600  | 4650  | 1020 | 5000 | 1380 | 2100 | 1930 | 2360 | 2090 |
| 16  | 2970  | ---  | 4800 | 5800  | 4250  | 1040 | 5030 | 1870 | 2060 | 1930 | 1900 | 2070 |
| 17  | 3160  | ---  | 4800 | 5600  | 3650  | 1090 | 5050 | 2180 | 2110 | 1920 | 2120 | 2140 |
| 18  | 4640  | ---  | 5000 | 5700  | ---   | 1180 | 4810 | 2180 | 2630 | 1980 | 1880 | 2070 |
| 19  | 4700  | ---  | 5000 | ---   | 3650  | 1260 | 5340 | 2830 | 1790 | 2070 | 1850 | 2070 |
| 20  | 2140  | ---  | 6400 | 5700  | ---   | 1340 | 5980 | 3030 | 2630 | 1900 | 1830 | 2070 |
| 21  | 1330  | ---  | 6500 | 5700  | 1180  | 1460 | 5870 | 2860 | 1490 | 1940 | 1910 | 2020 |
| 22  | 1330  | ---  | 4600 | ---   | 1030  | 1650 | 6150 | 2730 | 1530 | 1900 | 1750 | 2070 |
| 23  | 1180  | ---  | 4830 | 5800  | 940   | 1930 | 5750 | 3860 | 1500 | 1950 | 1720 | 2070 |
| 24  | 1870  | 2370 | 4490 | 5800  | 860   | 1750 | 5480 | 2740 | 1890 | 1900 | 1760 | 2160 |
| 25  | 2560  | 2000 | 5550 | 5800  | 1060  | 2090 | 5470 | 3860 | 1390 | 1900 | 1870 | 2160 |
| 26  | ---   | 2020 | 5000 | 5800  | 1160  | 2580 | 6840 | 3860 | 1790 | 1900 | 1860 | 1830 |
| 27  | 1880  | ---  | 4900 | 5800  | 1050  | 2110 | 6840 | 1140 | 1380 | 1890 | 2000 | 1920 |
| 28  | 2580  | ---  | 5550 | 5800  | 1060  | 2440 | 6940 | 1130 | 1700 | 1870 | 2100 | 1920 |
| 29  | 2560  | ---  | 4950 | 5700  | ---   | 2110 | 7350 | 1560 | 1700 | 1830 | 1990 | 2100 |
| 30  | 2400  | ---  | 4800 | 5800  | ---   | 2380 | 6710 | 1560 | 1690 | 1880 | 2210 | 2220 |
| 31  | 2890  | ---  | 5350 | ---   | ---   | 2650 | ---  | 1640 | ---  | 1830 | 2020 | ---  |
| AVG | C2050 | ---  | 4710 | D5710 | E3430 | 1320 | 4890 | 3520 | 2030 | 1930 | 1970 | 2050 |

C Based on 30 days of data.

D Based on 28 days of data.

E Based on 26 days of data.

## CHEYENNE RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT   | NOV | DEC | JAN  | FEB  | MAR | APR  | MAY   | JUN  | JUL  | AUG  | SEP  |
|-----|-------|-----|-----|------|------|-----|------|-------|------|------|------|------|
| 1   | 14.0  | --- | 2.0 | 0.0  | 0.0  | 0.0 | 5.0  | 8.0   | 25.0 | 27.0 | 22.0 | 18.0 |
| 2   | 16.0  | --- | 1.0 | 0.0  | 0.0  | 0.0 | 8.0  | 7.0   | 26.0 | 25.0 | 20.0 | 16.0 |
| 3   | 11.0  | --- | 0.0 | 0.0  | 0.0  | 0.0 | 4.0  | 8.0   | 22.0 | 20.0 | 19.0 | 17.0 |
| 4   | 10.0  | --- | 0.0 | 0.0  | 0.0  | 0.0 | 9.0  | 9.5   | 22.0 | 21.0 | 20.0 | 16.0 |
| 5   | 10.0  | --- | 0.0 | 0.0  | 0.0  | 1.0 | 7.0  | 12.0  | 24.0 | 20.0 | 20.0 | 16.5 |
| 6   | 10.0  | --- | 0.0 | 0.0  | 0.0  | 1.0 | 9.0  | 11.0  | 24.0 | 21.0 | 21.0 | 17.0 |
| 7   | 10.0  | --- | 0.0 | 0.0  | 0.0  | 0.0 | 12.0 | 9.0   | 27.0 | 21.0 | 20.0 | 18.0 |
| 8   | 11.0  | --- | 0.0 | 0.0  | 0.0  | 0.0 | 11.0 | 10.0  | 28.0 | 21.0 | 19.0 | 16.0 |
| 9   | 12.0  | --- | 0.0 | 0.0  | 0.0  | 0.0 | 9.0  | 9.0   | 28.0 | 22.0 | 21.0 | 17.0 |
| 10  | 12.0  | --- | 0.0 | 0.0  | 0.0  | 1.0 | 12.0 | 10.0  | 27.0 | 23.0 | 22.0 | 18.0 |
| 11  | 12.0  | --- | 0.0 | 0.0  | 0.0  | 1.0 | 15.0 | 11.0  | 28.0 | 27.0 | 21.0 | 17.0 |
| 12  | 11.0  | --- | 0.0 | 0.0  | 0.0  | 2.0 | 15.0 | 12.0  | 27.0 | 27.0 | 28.0 | 17.0 |
| 13  | 11.0  | --- | 0.0 | 0.0  | 0.0  | 4.0 | 11.0 | 12.0  | 25.0 | 28.0 | 26.0 | 17.0 |
| 14  | 11.0  | --- | 0.0 | 0.0  | 1.0  | 4.0 | 14.0 | 15.0  | 24.0 | 27.0 | 27.0 | 16.5 |
| 15  | 10.0  | --- | 0.0 | 0.0  | 0.0  | 4.0 | 15.0 | 17.0  | 22.0 | 27.0 | 26.0 | 18.0 |
| 16  | 10.0  | --- | 0.0 | 0.0  | 0.0  | 7.0 | 16.0 | 18.0  | 21.0 | 26.0 | 27.0 | 17.0 |
| 17  | 10.0  | --- | 0.0 | 0.0  | 0.0  | 7.0 | 11.0 | 20.0  | 19.0 | 23.5 | 27.0 | 14.5 |
| 18  | 9.0   | --- | 0.0 | 0.0  | 0.0  | 9.0 | 9.0  | 26.0  | 19.0 | 24.0 | 25.0 | 15.0 |
| 19  | 9.0   | --- | 0.0 | 0.0  | 0.0  | 8.0 | 10.0 | 26.0  | 18.0 | 19.0 | 25.0 | 15.0 |
| 20  | 9.0   | --- | 0.0 | 0.0  | 0.0  | 8.0 | 10.0 | 25.0  | 18.0 | 19.0 | 23.0 | 15.0 |
| 21  | 9.0   | --- | 0.0 | 0.0  | 0.0  | 7.0 | 9.0  | 25.0  | 18.0 | 19.0 | 21.0 | 15.0 |
| 22  | 8.0   | --- | 0.0 | 0.0  | 1.0  | 7.0 | 11.0 | 24.0  | 19.0 | 18.0 | 20.0 | 15.0 |
| 23  | 9.0   | --- | 0.0 | 0.0  | 0.0  | 6.0 | 11.0 | 24.0  | 19.0 | 19.0 | 20.5 | 14.0 |
| 24  | 9.0   | --- | 0.0 | 0.0  | 0.0  | 6.0 | 8.0  | 23.0  | 20.0 | 21.0 | 19.0 | 12.0 |
| 25  | 9.0   | --- | 0.0 | 0.0  | 1.0  | 5.0 | 12.0 | 22.0  | 19.0 | 23.0 | 20.0 | 11.0 |
| 26  | ---   | --- | 0.0 | 0.0  | 0.0  | 5.0 | 10.0 | 22.0  | 21.0 | 21.0 | 22.0 | 8.0  |
| 27  | 8.0   | --- | 0.0 | 0.0  | 1.0  | 3.0 | 9.0  | 20.0  | 22.0 | 22.0 | 19.0 | 12.0 |
| 28  | 7.0   | --- | 0.0 | 0.0  | 1.0  | 2.0 | 9.0  | 16.0  | 22.0 | 24.0 | 19.5 | 11.0 |
| 29  | 7.0   | --- | 0.0 | 0.0  | ---  | 2.0 | 9.0  | ---   | 25.0 | 26.0 | 22.0 | 9.0  |
| 30  | 5.0   | --- | 0.0 | 0.0  | ---  | 2.0 | 8.0  | 17.0  | 27.0 | 25.0 | 24.0 | 9.0  |
| 31  | 6.0   | --- | 0.0 | ---  | ---  | 4.0 | ---  | 18.0  | ---  | 23.0 | 24.0 | ---  |
| AVG | C10.0 | --- | 0.0 | C0.0 | D0.0 | 3.5 | 10.5 | C16.0 | 23.0 | 23.0 | 22.5 | 15.0 |

C Based on 30 days of data.

D Based on 28 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 1972.

Water temperatures: August 1954 to September 1958, October 1968 to September 1972.

Sediment records: October 1955 to September 1958.

EXTREMES.--1971-72:

Dissolved solids: Maximum, 2,500 mg/l Jan. 1-31; minimum, 761 mg/l Mar. 1-31.

Hardness: Maximum, 1,400 mg/l Jan. 1-31; minimum, 390 mg/l Mar. 1-31.

Period of record:

Dissolved solids (1954-58, 1968-69, 1970-72): Maximum, 5,230 mg/l May 25, 1958; minimum, 761 mg/l Mar. 1-31, 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE             | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SiO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 393                                        | 6.9                                                     | 130                                                         | 59                                                                 | 120                                                   | 13                                                                | 153                                             | 660                                                     | 17                                                           | .4                                                          | 1.6                                                                      |
| NOV.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30            | --   | 111                                        | 7.7                                                     | 240                                                         | 160                                                                | 250                                                   | 16                                                                | 266                                             | 1500                                                    | 39                                                           | .5                                                          | 6.5                                                                      |
| DEC.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 62                                         | 8.1                                                     | 250                                                         | 160                                                                | 260                                                   | 17                                                                | 267                                             | 1600                                                    | 38                                                           | .6                                                          | 5.2                                                                      |
| JAN.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 35                                         | 10                                                      | 300                                                         | 160                                                                | 220                                                   | 15                                                                | 282                                             | 1600                                                    | 36                                                           | .5                                                          | 4.0                                                                      |
| FEB.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29            | --   | 243                                        | 8.8                                                     | 200                                                         | 100                                                                | 150                                                   | 14                                                                | 192                                             | 1000                                                    | 25                                                           | .4                                                          | 3.8                                                                      |
| MAR.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 1500                                       | 6.9                                                     | 90                                                          | 39                                                                 | 80                                                    | 13                                                                | 129                                             | 450                                                     | 11                                                           | .3                                                          | 1.7                                                                      |
| APR.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30            | --   | 474                                        | 6.6                                                     | 160                                                         | 60                                                                 | 74                                                    | 13                                                                | 187                                             | 640                                                     | 9.0                                                          | .5                                                          | .98                                                                      |
| MAY              |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 1110                                       | 6.9                                                     | 140                                                         | 55                                                                 | 91                                                    | 15                                                                | 135                                             | 660                                                     | 11                                                           | .6                                                          | .56                                                                      |
| JUNE             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30            | --   | 1680                                       | 7.4                                                     | 140                                                         | 45                                                                 | 72                                                    | 16                                                                | 156                                             | 570                                                     | 7.3                                                          | --                                                          | .56                                                                      |
| JULY             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 428                                        | 7.6                                                     | 180                                                         | 74                                                                 | 90                                                    | 13                                                                | 189                                             | 790                                                     | 12                                                           | .9                                                          | 1.0                                                                      |
| AUG.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31            | --   | 428                                        | 6.9                                                     | 190                                                         | 83                                                                 | 100                                                   | 9.6                                                               | 188                                             | 870                                                     | 13                                                           | .7                                                          | 1.2                                                                      |
| SEP.             |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30            | --   | 303                                        | 5.9                                                     | 200                                                         | 82                                                                 | 100                                                   | 8.8                                                               | 186                                             | 890                                                     | 12                                                           | .6                                                          | .99                                                                      |
| WTD. AVG.        | --   | --                                         | 7.1                                                     | 143                                                         | 58                                                                 | 92                                                    | 14                                                                | 159                                             | 660                                                     | 12                                                           | .5                                                          | 1.3                                                                      |
| TIME WTD. AVG.   | --   | 565                                        | 7.5                                                     | 185                                                         | 90                                                                 | 134                                                   | 14                                                                | 194                                             | 936                                                     | 19                                                           | .5                                                          | 2.3                                                                      |
| TOT. LOAD (TONS) | --   | --                                         | 3970                                                    | 80100                                                       | 32700                                                              | 51400                                                 | 7700                                                              | 88500                                           | 368000                                                  | 6620                                                         | 214                                                         | 704                                                                      |

## ANALYSES OF ADDITIONAL SAMPLES

|       |       |     |     |     |     |     |     |     |      |    |    |     |
|-------|-------|-----|-----|-----|-----|-----|-----|-----|------|----|----|-----|
| JAN.  |       |     |     |     |     |     |     |     |      |    |    |     |
| 11... | A1400 | 47  | 10  | 320 | 180 | 240 | 15  | 414 | 1600 | 37 | .3 | 3.4 |
| FEB.  |       |     |     |     |     |     |     |     |      |    |    |     |
| 07... | A1300 | 26  | 11  | 300 | 150 | 290 | 15  | 412 | 1500 | 31 | .7 | 2.0 |
| APR.  |       |     |     |     |     |     |     |     |      |    |    |     |
| 04... | A1200 | 532 | 6.5 | 140 | 51  | 77  | 9.9 | 220 | 540  | 11 | .4 | .90 |
| AUG.  |       |     |     |     |     |     |     |     |      |    |    |     |
| 09... | A1400 | 263 | 5.9 | 200 | 87  | 100 | 9.3 | 191 | 920  | 13 | .7 | .77 |

A Discharge at time of sampling.

## CHEYENNE RIVER BASIN

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

## EXTREMES.--Continued

Period of record:--Continued

Hardness (1954-58, 1968-69, 1970-72): Maximum, 1,960 mg/l Nov. 16-17, 1955; minimum, 390 mg/l Mar. 1-31, 1972.

Specific conductance (1954-58, 1968-71): Maximum daily, 5,770 micromhos May 25, 1958; minimum daily, 650 micromhos Feb. 15, 1971.

Water temperatures (1954-58, 1968-71): 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, 2,620 mg/l Jan. 11; hardness, 1,500 mg/l Jan. 11; specific conductance, maximum daily, 3,280 micromhos Nov. 23; water temperature, 31.0°C July 13. Minimum observed during water year: Specific conductance, minimum daily, 810 micromhos Mar. 1; water temperatures, freezing point on many days October to February. Additional samples 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 1971 TO SEPTEMBER 1972

| DATE                     | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED PHOSPHORUS (P) (UG/L) (01020) | DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM ADSORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICROMHOS) (00095) | PH (UNITS) (03400) | TEMPERATURE (DEG C) (00010) |
|--------------------------|------------------------------------------|-------------------------------------|------------------------------------------|--------------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|------------------------------------------|--------------------|-----------------------------|
| OCT. 01-31               | --                                       | .050                                | 230                                      | 1090                                                   | 1.48                                       | 1160                                     | 570                              | 440                                   | 2.2                             | 1490                                     | 7.7                | --                          |
| NOV. 01-30               | --                                       | .030                                | 370                                      | 2370                                                   | 3.22                                       | 710                                      | 1300                             | 1000                                  | 3.1                             | 2810                                     | 7.9                | --                          |
| DEC. 01-31               | .040                                     | .34                                 | 350                                      | 2490                                                   | 3.39                                       | 417                                      | 1300                             | 1100                                  | 3.2                             | 2880                                     | 7.9                | --                          |
| JAN. 01-31               | .030                                     | .030                                | 450                                      | 2500                                                   | 3.40                                       | 236                                      | 1400                             | 1200                                  | 2.6                             | 2870                                     | 7.9                | --                          |
| FEB. 01-29               | .11                                      | .11                                 | 290                                      | 1610                                                   | 2.19                                       | 1060                                     | 910                              | 750                                   | 2.2                             | 2040                                     | 7.8                | --                          |
| MAR. 01-31               | .030                                     | .040                                | 140                                      | 761                                                    | 1.04                                       | 3080                                     | 390                              | 280                                   | 1.8                             | 1080                                     | 7.9                | --                          |
| APR. 01-30               | .040                                     | .050                                | 150                                      | 1060                                                   | 1.44                                       | 1360                                     | 650                              | 490                                   | 1.3                             | 1410                                     | 8.1                | --                          |
| MAY 01-31                | .040                                     | .060                                | 170                                      | 1050                                                   | 1.43                                       | 3150                                     | 580                              | 460                                   | 1.7                             | 1410                                     | 8.2                | --                          |
| JUNE 01-30               | .030                                     | .040                                | 180                                      | 937                                                    | 1.27                                       | 4250                                     | 530                              | 410                                   | 1.4                             | 1280                                     | 8.0                | --                          |
| JULY 01-31               | .040                                     | .050                                | 210                                      | 1270                                                   | 1.73                                       | 1470                                     | 750                              | 600                                   | 1.4                             | 1640                                     | 8.1                | --                          |
| AUG. 01-31               | .040                                     | .040                                | 270                                      | 1370                                                   | 1.86                                       | 1580                                     | 820                              | 660                                   | 1.5                             | 1790                                     | 8.2                | --                          |
| SEP. 01-30               | .030                                     | .030                                | 270                                      | 1400                                                   | 1.90                                       | 1150                                     | 840                              | 680                                   | 1.5                             | 1790                                     | 8.1                | --                          |
| WTD. AVG. TIME WTD. AVG. | B.037<br>B.043                           | .050<br>.073                        | 192<br>257                               | 1070<br>1490                                           | 1.46<br>2.03                               | --<br>--                                 | 601<br>836                       | 468<br>672                            | 1.7<br>2.0                      | 1430<br>1870                             | 8.0<br>8.0         | --<br>--                    |
| TOT. LOAD (TONS)         | B19                                      | 28                                  | 107                                      | 598000                                                 | --                                         | --                                       | --                               | --                                    | --                              | --                                       | --                 | --                          |

## ANALYSES OF ADDITIONAL SAMPLES

|            |      |      |     |      |      |      |      |      |     |      |     |      |
|------------|------|------|-----|------|------|------|------|------|-----|------|-----|------|
| JAN. 11... | --   | .010 | 460 | 2620 | 3.56 | 332  | 1500 | 1200 | 2.7 | 3090 | 7.6 | .0   |
| FEB. 07... | --   | .060 | 420 | 2510 | 3.41 | 178  | 1400 | 1000 | 3.4 | 2950 | 7.4 | .0   |
| APR. 04... | .030 | .81  | 140 | 948  | 1.29 | 1360 | 560  | 380  | 1.4 | 1260 | 8.1 | 6.5  |
| AUG. 09... | 1.2  | .11  | 280 | 1440 | 1.96 | 1020 | 860  | 700  | 1.5 | 1820 | 7.8 | 24.5 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

B Based on 305 days of chemical analysis.

## CHEYENNE RIVER BASIN

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|------------------------------------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| FEB.<br>07... | 1300 | 26                                 | 300                                                          | 260                                                 | 920                                                           | 10                                                     | 1                                                           | 0                                                            | 1                                                     | 70                                                    |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT   | NOV   | DEC  | JAN  | FEB   | MAR   | APR   | MAY   | JUN   | JUL  | AUG  | SEP  |
|-----|-------|-------|------|------|-------|-------|-------|-------|-------|------|------|------|
| 1   | 2060  | 2540  | 2750 | ---  | 2880  | 810   | ---   | 1570  | 1220  | 1370 | 1770 | 1850 |
| 2   | 1930  | 2540  | 2700 | ---  | 2820  | 840   | 1170  | 2830  | 1190  | 1410 | ---  | 1870 |
| 3   | 1720  | 2640  | 2850 | ---  | 2810  | 840   | 1150  | 2080  | 1190  | 1390 | 1680 | 1870 |
| 4   | 984   | 2680  | 2950 | ---  | 2800  | 960   | 1290  | 1760  | 1220  | 1430 | 1720 | 1850 |
| 5   | 849   | 2730  | ---  | ---  | 2690  | 1240  | 1380  | 1720  | 2120  | 1670 | 1820 | 1850 |
| 6   | 1020  | 2870  | 3200 | ---  | ---   | 1180  | 1450  | 1490  | 1240  | ---  | ---  | 1840 |
| 7   | 1110  | ---   | ---  | ---  | 2650  | 1260  | 1500  | 1390  | 1480  | 1660 | 1980 | 1800 |
| 8   | 1420  | 2960  | ---  | ---  | ---   | 1360  | 1550  | 1280  | 1410  | 1580 | 1880 | 1830 |
| 9   | 1640  | 2750  | 3100 | ---  | 2600  | 980   | 1450  | 1170  | 1430  | 1670 | 1850 | 1850 |
| 10  | 1790  | 2770  | ---  | ---  | 2550  | 1200  | 1450  | 1140  | 1570  | ---  | 1880 | ---  |
| 11  | 1890  | 2510  | ---  | ---  | 2520  | 950   | 1550  | 1910  | 1390  | 1720 | ---  | 1800 |
| 12  | 1980  | 2490  | ---  | ---  | 2500  | 1060  | 1530  | 1630  | 1630  | 1810 | ---  | 1800 |
| 13  | 2110  | 2600  | ---  | 3200 | 2450  | 1140  | 1580  | 1540  | ---   | 1880 | 1930 | 1770 |
| 14  | 2220  | 2760  | ---  | 3100 | 2400  | 1020  | 1580  | 1300  | 1470  | 2030 | ---  | 1800 |
| 15  | 2250  | 2730  | ---  | 3050 | 2420  | 940   | 1520  | 1180  | ---   | ---  | ---  | 1860 |
| 16  | 2330  | 2770  | ---  | 3150 | 2400  | 980   | 1420  | 1130  | ---   | 1820 | 2010 | 1860 |
| 17  | 2400  | 2640  | ---  | 3000 | 1460  | 1040  | 1480  | 1160  | 1450  | 1780 | 1920 | 1840 |
| 18  | 2380  | 2750  | ---  | 3150 | 2440  | 1070  | 1470  | 1130  | 1390  | ---  | ---  | 1860 |
| 19  | 1560  | 2860  | ---  | 2900 | 1650  | 1090  | 1450  | 1160  | 1190  | ---  | 1800 | 1850 |
| 20  | 2310  | 2860  | ---  | 3200 | ---   | 1080  | 1450  | 1190  | 1210  | 1910 | ---  | 1850 |
| 21  | 1540  | 2890  | ---  | 3050 | 1330  | 1100  | 1740  | 1260  | 1070  | 1840 | 1830 | 1880 |
| 22  | 1450  | ---   | ---  | 3000 | 1150  | 1100  | 1660  | 1290  | 1120  | 1830 | 1840 | 1880 |
| 23  | 1490  | 3280  | ---  | 3000 | 1200  | ---   | 1490  | 1420  | 1140  | ---  | 1800 | 1870 |
| 24  | ---   | 3260  | ---  | 2800 | 1040  | 1200  | 1500  | 1280  | 1260  | 1850 | 1780 | 1820 |
| 25  | 1980  | ---   | ---  | 2900 | 1140  | ---   | ---   | 1120  | 1270  | 1900 | 1740 | ---  |
| 26  | 2080  | ---   | ---  | 3100 | 1060  | 1360  | 1450  | ---   | 1380  | 1780 | 1820 | ---  |
| 27  | 2220  | 2600  | ---  | 3100 | 1340  | ---   | ---   | 1340  | 1390  | 1790 | 1800 | ---  |
| 28  | 2240  | 2460  | ---  | ---  | 1260  | 1360  | 1640  | 1270  | 1340  | 1770 | 1860 | ---  |
| 29  | 2320  | 2830  | ---  | 3200 | 1250  | 1190  | 1720  | ---   | 1400  | 1770 | 1830 | ---  |
| 30  | 2340  | 2910  | ---  | 3200 | ---   | 1130  | 1670  | 1490  | 1420  | 1780 | 1840 | ---  |
| 31  | ---   | ---   | ---  | 3000 | ---   | 1160  | ---   | 1350  | ---   | ---  | 1920 | ---  |
| AVG | C1850 | D2760 | ---  | ---  | D2030 | E1090 | F1490 | C1430 | F1360 | ---  | ---  | ---  |

C Based on 29 days of data.

D Based on 26 days of data.

E Based on 28 days of data.

F Based on 27 days of data.



## CHEYENNE RIVER BASIN

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>SILVER<br>(AG)<br>(UG/L)<br>(01075) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) |
|---------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|
| FEB.<br>07... | 0                                                   | 160                                                    | .3                                            | 0                                                              | 12                                                    | 3                                                            | 0                                                     | 3500                                                          | .3                                                          |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC | JAN | FEB | MAR  | APR   | MAY   | JUN   | JUL  | AUG  | SEP  |
|-----|------|------|-----|-----|-----|------|-------|-------|-------|------|------|------|
| 1   | 13.5 | 4.0  | 0.0 | --- | 0.0 | ---  | ---   | 7.0   | 23.0  | 24.0 | 23.0 | 18.0 |
| 2   | 6.0  | 1.5  | 0.0 | --- | 0.0 | ---  | 8.0   | 9.0   | 26.0  | 20.0 | ---  | 15.0 |
| 3   | 7.5  | 2.5  | 0.0 | --- | 0.0 | ---  | 5.0   | 7.0   | 22.0  | 19.0 | 20.5 | 20.5 |
| 4   | 6.5  | 2.0  | 0.0 | --- | 0.0 | ---  | 5.5   | 9.0   | 25.0  | ---  | 25.0 | 16.0 |
| 5   | 8.5  | 0.0  | --- | --- | --- | ---  | 8.0   | 16.0  | 25.0  | 24.0 | 25.0 | 17.0 |
| 6   | 13.0 | 0.0  | 0.0 | --- | --- | ---  | 11.0  | 11.0  | 24.0  | 24.0 | ---  | 18.0 |
| 7   | 11.0 | ---  | --- | --- | 0.0 | ---  | 10.5  | 11.0  | 22.0  | ---  | 26.0 | 16.5 |
| 8   | 10.0 | 0.0  | --- | --- | --- | 2.0  | 14.0  | 10.5  | 25.0  | 28.0 | 23.0 | 15.5 |
| 9   | 12.5 | 0.0  | 0.0 | --- | 0.0 | 2.0  | 9.5   | 9.0   | 24.0  | 27.0 | 24.0 | 22.0 |
| 10  | 15.0 | 0.0  | --- | --- | 0.0 | 2.5  | 12.0  | 10.0  | 20.0  | ---  | 26.0 | ---  |
| 11  | ---  | 0.0  | --- | --- | 0.0 | 6.0  | 10.5  | 10.0  | 24.0  | 26.0 | ---  | 21.0 |
| 12  | 11.0 | 0.0  | --- | 0.0 | 0.0 | 6.5  | 14.0  | 12.0  | 25.0  | 26.0 | ---  | 17.0 |
| 13  | 7.0  | 3.5  | --- | 0.0 | 0.0 | 6.5  | 12.0  | 13.0  | ---   | 31.0 | 28.0 | 17.0 |
| 14  | 10.0 | 8.0  | --- | 0.0 | 0.0 | 7.0  | 11.0  | 17.0  | ---   | 24.0 | ---  | 15.0 |
| 15  | 8.0  | 6.0  | --- | 0.0 | 0.0 | 6.0  | 9.0   | 17.0  | ---   | ---  | ---  | ---  |
| 16  | 8.0  | 2.5  | --- | 0.0 | 0.0 | ---  | 17.0  | 17.0  | ---   | 27.0 | ---  | 20.0 |
| 17  | 10.0 | 0.5  | --- | 0.0 | 0.0 | ---  | 13.0  | 20.5  | 21.0  | 25.5 | 26.0 | 20.0 |
| 18  | 9.5  | 0.0  | --- | 0.0 | 0.0 | 11.5 | 9.5   | 20.0  | 24.0  | ---  | ---  | 15.0 |
| 19  | 7.0  | 1.5  | --- | 0.0 | 0.0 | 12.0 | 8.5   | 18.0  | 16.0  | ---  | 25.5 | 20.0 |
| 20  | 11.5 | 5.0  | --- | 0.0 | --- | 10.0 | 8.5   | 14.0  | 14.0  | 20.0 | ---  | 14.5 |
| 21  | 9.5  | 0.5  | --- | 0.0 | --- | 9.0  | 14.5  | 24.0  | 16.0  | 23.0 | 22.0 | 11.0 |
| 22  | 11.0 | 0.5  | --- | 0.0 | --- | 9.5  | 11.0  | 23.0  | 20.0  | 24.0 | 20.5 | 12.0 |
| 23  | 7.5  | 1.0  | --- | 0.0 | --- | ---  | 9.0   | 22.0  | 23.0  | ---  | 22.0 | 17.0 |
| 24  | ---  | 0.0  | --- | 0.0 | --- | 7.0  | 9.0   | 22.0  | ---   | 25.0 | 24.0 | 14.0 |
| 25  | 11.0 | ---  | --- | 0.0 | --- | ---  | ---   | 22.0  | 24.0  | 21.5 | 23.0 | ---  |
| 26  | 7.0  | ---  | --- | 0.0 | --- | 8.0  | 10.5  | ---   | 22.0  | 27.0 | 25.0 | ---  |
| 27  | 7.0  | 1.5  | --- | 0.0 | --- | ---  | ---   | 20.0  | 22.0  | 24.0 | 25.0 | ---  |
| 28  | 0.0  | 0.5  | --- | --- | --- | 3.0  | 10.0  | 17.0  | 23.0  | 25.0 | 25.0 | ---  |
| 29  | 1.0  | 0.0  | --- | 0.0 | --- | 3.0  | 11.0  | ---   | 23.0  | 22.0 | 24.0 | ---  |
| 30  | 0.0  | 0.0  | --- | 0.0 | --- | 3.0  | 11.5  | 16.0  | 25.0  | 26.0 | 24.0 | ---  |
| 31  | ---  | ---  | --- | 0.0 | --- | 8.0  | ---   | 22.0  | ---   | ---  | 19.0 | ---  |
| AVG | E8.5 | F1.5 | --- | --- | --- | ---  | F10.5 | C15.5 | G22.5 | ---  | ---  | ---  |

C Based on 29 days of data.

E Based on 28 days of data.

F Based on 27 days of data.

G Based on 25 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 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | CAR-<br>BONATE<br>(CO3)<br>(MG/L)<br>(00445) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) |
|---------------|------|------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCT.<br>21... | 1100 | 303                                | 120                                                         | 60                                                                 | 190                                                   | 8.8                                                               | 128                                             | 0                                            | 830                                                     | 26                                                           | .5                                                          |
| NOV.<br>18... | 1300 | 69                                 | 250                                                         | 130                                                                | --                                                    | --                                                                | --                                              | --                                           | 1400                                                    | 32                                                           | --                                                          |
| DEC.<br>16... | 1200 | 40                                 | 370                                                         | 200                                                                | --                                                    | --                                                                | --                                              | --                                           | 2100                                                    | 49                                                           | --                                                          |
| JAN.<br>12... | 1030 | 20                                 | 350                                                         | 180                                                                | 250                                                   | 16                                                                | 436                                             | 0                                            | 1800                                                    | 40                                                           | .5                                                          |
| FEB.<br>15... | 1130 | 23                                 | 340                                                         | 150                                                                | --                                                    | --                                                                | --                                              | --                                           | 1500                                                    | 34                                                           | --                                                          |
| MAR.<br>13... | 1000 | 2850                               | 77                                                          | 27                                                                 | --                                                    | --                                                                | --                                              | --                                           | 350                                                     | 7.1                                                          | --                                                          |
| APR.<br>11... | 1330 | 444                                | 180                                                         | 69                                                                 | 88                                                    | 11                                                                | 228                                             | 0                                            | 720                                                     | 11                                                           | .5                                                          |
| MAY<br>15...  | 1500 | 1850                               | 110                                                         | 41                                                                 | --                                                    | --                                                                | --                                              | --                                           | 520                                                     | 12                                                           | --                                                          |
| AUG.<br>25... | 1100 | 503                                | 200                                                         | 82                                                                 | 98                                                    | 11                                                                | 179                                             | 0                                            | 890                                                     | 15                                                           | .6                                                          |
| SEP.<br>14... | 1100 | 326                                | 190                                                         | 79                                                                 | 100                                                   | 8.6                                                               | 163                                             | 0                                            | 890                                                     | 12                                                           | .5                                                          |

NOTE.--Carbonate (CO3) analysis for all samples, 0.0 mg/l.

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | CYANIDE<br>(CN)<br>(MG/L)<br>(00720) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BERYL-<br>LIUM<br>(BE)<br>(UG/L)<br>(01010) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|------------------------------------|---------------------------------------------------------------|--------------------------------------|--------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| OCT.<br>21... | 1100 | 303                                | 20                                                            | .00                                  | 6                                                      | 0                                                             | 0                                                           | 1                                                            | 17                                                    |
| JAN.<br>12... | 1030 | 20                                 | 910                                                           | .01                                  | 30                                                     | 0                                                             | 2                                                           | 0                                                            | 40                                                    |
| APR.<br>11... | 1330 | 444                                | 90                                                            | .00                                  | 30                                                     | 0                                                             | 0                                                           | 0                                                            | 5                                                     |

## CHEYENNE RIVER BASIN

65

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

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

PERIOD OF RECORD.--July 1969 to September 1972.

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(RESI-<br>DUE AT<br>180 C)<br>(MG/L)<br>(70300) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|--------------------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>21... | 3.3                                                                      | 230                                                 | 1200                                                                        | 1.63                                                   | 982                                                         | 550                                           | 440                                                          | 3.5                                                | 1790                                                                  | 7.8                      | 9.0                                    |
| NOV.<br>18... | 3.8                                                                      | --                                                  | 2340                                                                        | 3.18                                                   | 436                                                         | --                                            | --                                                           | --                                                 | 2680                                                                  | 7.8                      | .0                                     |
| DEC.<br>16... | 5.0                                                                      | --                                                  | 2480                                                                        | 3.37                                                   | 273                                                         | 1700                                          | --                                                           | --                                                 | 3740                                                                  | 7.6                      | .0                                     |
| JAN.<br>12... | 3.4                                                                      | 470                                                 | 2800                                                                        | 3.81                                                   | 151                                                         | 1600                                          | 1300                                                         | 2.7                                                | 3250                                                                  | 7.7                      | .0                                     |
| FEB.<br>15... | 1.7                                                                      | --                                                  | 2440                                                                        | 3.32                                                   | 154                                                         | 1500                                          | --                                                           | --                                                 | 2890                                                                  | 7.6                      | .0                                     |
| MAR.<br>13... | 1.2                                                                      | --                                                  | 644                                                                         | .88                                                    | 4960                                                        | 300                                           | --                                                           | --                                                 | 888                                                                   | 7.7                      | 4.0                                    |
| APR.<br>11... | 1.0                                                                      | 170                                                 | 1300                                                                        | 1.77                                                   | 1560                                                        | 730                                           | 550                                                          | 1.4                                                | 1550                                                                  | 8.2                      | 14.0                                   |
| MAY<br>15...  | .53                                                                      | --                                                  | 928                                                                         | 1.26                                                   | 4640                                                        | 440                                           | --                                                           | --                                                 | 1200                                                                  | 7.8                      | 19.0                                   |
| AUG.<br>25... | .21                                                                      | --                                                  | 1500                                                                        | 2.04                                                   | 2040                                                        | 840                                           | 690                                                          | 1.5                                                | 1750                                                                  | 8.0                      | 20.0                                   |
| SEP.<br>14... | .62                                                                      | --                                                  | 1480                                                                        | 2.01                                                   | 1300                                                        | 800                                           | 670                                                          | 1.5                                                | 1760                                                                  | 8.0                      | 16.0                                   |

| DATE          | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>SILVER<br>(AG)<br>(UG/L)<br>(01075) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|---------------|-----------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| OCT.<br>21... | 1                                                   | .8                                            | 0                                                              | 6                                                     | 8                                                            | 0                                                     | .4                                                          | 30                                                  |
| JAN.<br>12... | 11                                                  | .2                                            | 7                                                              | 17                                                    | 3                                                            | 1                                                     | .6                                                          | 20                                                  |
| APR.<br>11... | 0                                                   | .5                                            | 18                                                             | 5                                                     | 0                                                            | 0                                                     | .4                                                          | 20                                                  |

## CHEYENNE RIVER BASIN

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00618) | DIS-<br>SOLVED<br>NITRITE<br>(N)<br>(MG/L)<br>(00613) | DIS-<br>SOLVED<br>AMMONIA<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00608) | ORGANIC<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00605) | TOTAL<br>KJEL-<br>DAHL<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00625) | TOTAL<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00600) | DIS-<br>SOLVED<br>ORTHO.<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00671) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|------|------------------------------------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------|
| OCT.<br>21... | 1100 | 303                                | --                                                    | --                                                    | .12                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 9.0                                    |
| NOV.<br>18... | 1300 | 69                                 | 3.8                                                   | .040                                                  | .63                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| DEC.<br>16... | 1200 | 40                                 | 5.0                                                   | .040                                                  | .44                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| JAN.<br>12... | 1030 | 20                                 | --                                                    | --                                                    | .59                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| FEB.<br>15... | 1130 | 23                                 | 1.7                                                   | .030                                                  | .63                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| MAR.<br>13... | 1000 | 2850                               | 1.2                                                   | .000                                                  | .16                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 4.0                                    |
| APR.<br>11... | 1330 | 444                                | --                                                    | --                                                    | .28                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 14.0                                   |
| MAY<br>15...  | 1500 | 1850                               | .52                                                   | .010                                                  | .12                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 19.0                                   |
| AUG.<br>25... | 1100 | 503                                | .21                                                   | .000                                                  | .05                                                                    | .91                                                  | .96                                                                 | 1.2                                                | .030                                                                    | 20.0                                   |
| SEP.<br>14... | 1100 | 326                                | .62                                                   | .000                                                  | .05                                                                    | .51                                                  | .56                                                                 | 1.2                                                | .000                                                                    | 16.0                                   |

## PESTICIDES

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | ALDRIN<br>(UG/L)<br>(39330) | CHLOR-<br>DANE<br>(UG/L)<br>(39350) | DDD<br>(UG/L)<br>(39360) | DDE<br>(UG/L)<br>(39365) | DDT<br>(UG/L)<br>(39370) | DI-<br>ELDRIN<br>(UG/L)<br>(39380) |
|---------------|------|------------------------------------|-----------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|------------------------------------|
| OCT.<br>21... | 1100 | 303                                | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |
| JAN.<br>12... | 1030 | 20                                 | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |
| APR.<br>11... | 1330 | 444                                | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |

## CHEYENNE RIVER BASIN

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## FIELD DETERMINATIONS

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>OXYGEN<br>(MG/L)<br>(00300) | BIO-<br>CHEM-<br>ICAL<br>OXYGEN<br>DEMAND<br>(MG/L)<br>(00310) | PH<br>(UNITS)<br>(00400) | IMME-<br>DIATE<br>COLI-<br>FORM<br>(COL.<br>PER<br>100 ML)<br>(31501) | FECAL<br>COLI-<br>FORM<br>(COL.<br>PER<br>100 ML)<br>(31616) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | AIR<br>TEMP-<br>ERATURE<br>(DEG C)<br>(00020) |
|---------------|------|------------------------------------|-----------------------------------------------|----------------------------------------------------------------|--------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------|----------------------------------------|-----------------------------------------------|
| OCT.<br>21... | 1100 | 303                                | 10.4                                          | 1.0                                                            | 8.6                      | --                                                                    | 2350                                                         | 9.0                                    | 10.5                                          |
| NOV.<br>18... | 1300 | 69                                 | 12.9                                          | .8                                                             | 7.9                      | --                                                                    | 2                                                            | .0                                     | .0                                            |
| DEC.<br>16... | 1200 | 40                                 | 11.7                                          | .4                                                             | 8.2                      | --                                                                    | 10                                                           | .0                                     | 2.0                                           |
| JAN.<br>12... | 1030 | 20                                 | 9.7                                           | .4                                                             | 7.8                      | --                                                                    | 1                                                            | .0                                     | -5.0                                          |
| FEB.<br>15... | 1130 | 23                                 | 7.7                                           | --                                                             | 8.5                      | --                                                                    | 10                                                           | .0                                     | -2.5                                          |
| MAR.<br>13... | 1000 | 2850                               | 9.7                                           | 2.8                                                            | 8.4                      | --                                                                    | 2200                                                         | 4.0                                    | 8.0                                           |
| APR.<br>11... | 1330 | 444                                | 8.8                                           | 1.2                                                            | 7.8                      | --                                                                    | 43                                                           | 14.0                                   | 25.0                                          |
| MAY<br>15...  | 1500 | 1850                               | 7.5                                           | 1.6                                                            | 7.7                      | --                                                                    | 350                                                          | 19.0                                   | 33.0                                          |
| AUG.<br>25... | 1100 | 503                                | 8.7                                           | 1.5                                                            | 10.2                     | 8600                                                                  | 300                                                          | 20.0                                   | 29.5                                          |
| SEP.<br>14... | 1100 | 326                                | 8.2                                           | 1.0                                                            | --                       | 67                                                                    | 36                                                           | 16.0                                   | 25.0                                          |

## PESTICIDES

| DATE          | ENDRIN<br>(UG/L)<br>(39390) | HEPTA-<br>CHLOR<br>(UG/L)<br>(39410) | HEPTA-<br>CHLOR<br>EPOXIDE<br>(UG/L)<br>(39420) | LINDANE<br>(UG/L)<br>(39340) | 2,4-D<br>(UG/L)<br>(39730) | 2,4,5-T<br>(UG/L)<br>(39740) | SILVEX<br>(UG/L)<br>(39760) |
|---------------|-----------------------------|--------------------------------------|-------------------------------------------------|------------------------------|----------------------------|------------------------------|-----------------------------|
| OCT.<br>21... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |
| JAN.<br>12... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |
| APR.<br>11... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |

## CHEYENNE RIVER BASIN

06439300 CHEYENNE RIVER AT CHERRY CREEK, S. DAK.

LOCATION.--Lat 44°36'10", long 101°29'24", in NE¼NW¼ sec.5, T.7 N., R.22 E., Ziebach County, at gaging station, on left bank 0.5 mile east of village of Cherry Creek, 0.5 mile downstream from Cherry Creek, and 1.7 miles upstream from Plum Creek.

DRAINAGE AREA.--23,900 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: June to September 1972.  
Sediment records: October 1971 to September 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SIO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE<br>14... | 1400 | 5450                               | 10                                                      | 90                                                          | 25                                                                 | 64                                                    | 9.9                                                               | 150                                             | 340                                                     | 8.8                                                          | .5                                                          | .55                                                                      |
| AUG.<br>23... | 1200 | 550                                | 7.8                                                     | 170                                                         | 75                                                                 | 130                                                   | 12                                                                | 136                                             | 900                                                     | 96                                                           | 1.1                                                         | .11                                                                      |

NOTE.--Carbonate (CO3) analysis for all samples, 0.0 mg/l.

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | OCTOBER                    |                                      |                                     | NOVEMBER                   |                                      |                                     | DECEMBER                   |                                      |                                     |
|-------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 308                        | 2700                                 | 2250                                | 311                        | 250                                  | 210                                 | 245                        | 600                                  | 397                                 |
| 2     | 328                        | 4600                                 | 4070                                | 356                        | 3500                                 | 3360                                | 220                        | 550                                  | 327                                 |
| 3     | 307                        | 1500                                 | 1220                                | 423                        | 7000                                 | 7990                                | 210                        | 500                                  | 284                                 |
| 4     | 1490                       | 9000                                 | 36200                               | 402                        | 6000                                 | 6510                                | 190                        | 450                                  | 231                                 |
| 5     | 2350                       | 11700                                | 74200                               | 353                        | 3000                                 | 2860                                | 180                        | 425                                  | 207                                 |
| 6     | 1990                       | 9000                                 | 48400                               | 320                        | 2000                                 | 1730                                | 170                        | 403                                  | 184                                 |
| 7     | 1270                       | 3500                                 | 12000                               | 350                        | 3200                                 | 3020                                | 160                        | 410                                  | 177                                 |
| 8     | 709                        | 2300                                 | 4400                                | 350                        | 3300                                 | 3120                                | 140                        | 400                                  | 151                                 |
| 9     | 454                        | 1700                                 | 2080                                | 380                        | 3200                                 | 3280                                | 150                        | 380                                  | 154                                 |
| 10    | 365                        | 1100                                 | 1080                                | 400                        | 3300                                 | 3560                                | 150                        | 370                                  | 150                                 |
| 11    | 317                        | 562                                  | 481                                 | 420                        | 3300                                 | 3740                                | 140                        | 390                                  | 147                                 |
| 12    | 290                        | 430                                  | 337                                 | 350                        | 3000                                 | 2840                                | 130                        | 360                                  | 126                                 |
| 13    | 260                        | 320                                  | 225                                 | 320                        | 2700                                 | 2330                                | 130                        | 380                                  | 133                                 |
| 14    | 239                        | 240                                  | 155                                 | 300                        | 2400                                 | 1940                                | 140                        | 370                                  | 140                                 |
| 15    | 224                        | 190                                  | 115                                 | 280                        | 2100                                 | 1590                                | 140                        | 350                                  | 132                                 |
| 16    | 221                        | 160                                  | 95                                  | 260                        | 1800                                 | 1260                                | 140                        | 370                                  | 140                                 |
| 17    | 221                        | 110                                  | 66                                  | 250                        | 1500                                 | 1010                                | 150                        | 360                                  | 146                                 |
| 18    | 272                        | 250                                  | 184                                 | 240                        | 1000                                 | 648                                 | 160                        | 350                                  | 151                                 |
| 19    | 476                        | 2600                                 | 3340                                | 250                        | 1100                                 | 743                                 | 160                        | 370                                  | 160                                 |
| 20    | 1090                       | 24800                                | 73000                               | 330                        | 900                                  | 802                                 | 160                        | 360                                  | 156                                 |
| 21    | 624                        | 18500                                | 31200                               | 330                        | 850                                  | 757                                 | 160                        | 340                                  | 147                                 |
| 22    | 420                        | 13000                                | 14700                               | 400                        | 800                                  | 864                                 | 170                        | 330                                  | 151                                 |
| 23    | 426                        | 12000                                | 13800                               | 380                        | 825                                  | 846                                 | 180                        | 350                                  | 170                                 |
| 24    | 462                        | 8000                                 | 9980                                | 335                        | 790                                  | 715                                 | 190                        | 320                                  | 164                                 |
| 25    | 383                        | 4300                                 | 4450                                | 320                        | 770                                  | 665                                 | 170                        | 340                                  | 156                                 |
| 26    | 341                        | 2500                                 | 2300                                | 293                        | 780                                  | 617                                 | 140                        | 330                                  | 125                                 |
| 27    | 314                        | 1200                                 | 1020                                | 302                        | 750                                  | 612                                 | 150                        | 310                                  | 126                                 |
| 28    | 308                        | 500                                  | 416                                 | 280                        | 730                                  | 552                                 | 170                        | 290                                  | 133                                 |
| 29    | 305                        | 440                                  | 362                                 | 250                        | 700                                  | 473                                 | 160                        | 330                                  | 143                                 |
| 30    | 302                        | 380                                  | 310                                 | 245                        | 650                                  | 430                                 | 160                        | 310                                  | 134                                 |
| 31    | 293                        | 310                                  | 245                                 | --                         | --                                   | --                                  | 160                        | 300                                  | 130                                 |
| TOTAL | 17354                      | --                                   | 342681                              | 9780                       | --                                   | 59074                               | 5075                       | --                                   | 5272                                |



## CHEYENNE RIVER BASIN

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06439300 CHEYENNE RIVER AT CHERRY CREEK, S. DAK.--Continued

## EXTREMES.--1971-72:

Sediment concentrations: Maximum daily, 65,000 mg/l June 12; minimum daily, 100 mg/l Feb. 11.

Sediment discharge: Maximum daily, 2,530,000 tons June 12; minimum daily, 16 tons Feb. 10.

REMARKS.--Records poor. Flow affected by ice Nov. 6-11, 17-19, Nov. 28 to Mar. 8. Suspended-sediment concentrations prior to July 1 furnished by District office, Corps of Engineers, Omaha, Nebr. Sediment-discharge records prior to Oct. 1, 1971, are on file in the District office, Corps of Engineers, Omaha, Nebr.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| JUNE<br>14... | .040                                                                | 1.1                                                  | 170                                                 | 625                                                                            | .97                                                           | 9200                                                        | 330                                            | 200                                                          | 1.5                                                | 902                                                                   | 7.3                      | 23.5                                   |
| AUG.<br>23... | --                                                                  | .57                                                  | --                                                  | 1470                                                                           | 2.04                                                          | 2230                                                        | 730                                            | 620                                                          | 2.1                                                | 1790                                                                  | 7.9                      | 21.0                                   |

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | JANUARY                    |                                      |                                     | FEBRUARY                   |                                      |                                     | MARCH                      |                                      |                                     |
|-------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 140                        | 300                                  | 113                                 | 55                         | 190                                  | 28                                  | 4000                       | 4500                                 | 48600                               |
| 2     | 125                        | 295                                  | 100                                 | 50                         | 185                                  | 25                                  | 3300                       | 4000                                 | 35600                               |
| 3     | 115                        | 290                                  | 90                                  | 50                         | 180                                  | 24                                  | 3200                       | 3500                                 | 30200                               |
| 4     | 110                        | 290                                  | 86                                  | 48                         | 170                                  | 22                                  | 3100                       | 3000                                 | 25100                               |
| 5     | 105                        | 285                                  | 81                                  | 48                         | 160                                  | 21                                  | 3000                       | 2500                                 | 20300                               |
| 6     | 115                        | 280                                  | 87                                  | 48                         | 150                                  | 19                                  | 2500                       | 2000                                 | 13500                               |
| 7     | 130                        | 275                                  | 97                                  | 48                         | 140                                  | 18                                  | 3500                       | 3000                                 | 28400                               |
| 8     | 140                        | 275                                  | 104                                 | 50                         | 130                                  | 18                                  | 4500                       | 5000                                 | 60800                               |
| 9     | 140                        | 270                                  | 102                                 | 55                         | 120                                  | 18                                  | 3800                       | 8000                                 | 82100                               |
| 10    | 130                        | 265                                  | 93                                  | 55                         | 110                                  | 16                                  | 3000                       | 7500                                 | 60800                               |
| 11    | 120                        | 260                                  | 84                                  | 65                         | 100                                  | 18                                  | 2800                       | 7400                                 | 55900                               |
| 12    | 110                        | 260                                  | 77                                  | 80                         | 150                                  | 32                                  | 3000                       | 7300                                 | 59100                               |
| 13    | 90                         | 255                                  | 62                                  | 95                         | 200                                  | 51                                  | 2800                       | 7200                                 | 54400                               |
| 14    | 80                         | 255                                  | 55                                  | 100                        | 300                                  | 81                                  | 2800                       | 7100                                 | 53700                               |
| 15    | 80                         | 250                                  | 54                                  | 100                        | 400                                  | 108                                 | 2900                       | 7000                                 | 54800                               |
| 16    | 90                         | 250                                  | 61                                  | 130                        | 500                                  | 176                                 | 2500                       | 6500                                 | 43900                               |
| 17    | 90                         | 245                                  | 60                                  | 160                        | 600                                  | 259                                 | 2200                       | 5900                                 | 35000                               |
| 18    | 90                         | 240                                  | 58                                  | 220                        | 800                                  | 475                                 | 1800                       | 5200                                 | 25300                               |
| 19    | 80                         | 240                                  | 52                                  | 500                        | 1200                                 | 1620                                | 1600                       | 4500                                 | 19400                               |
| 20    | 80                         | 235                                  | 51                                  | 700                        | 1800                                 | 3400                                | 1450                       | 4000                                 | 15700                               |
| 21    | 80                         | 235                                  | 51                                  | 1100                       | 2500                                 | 7430                                | 1450                       | 3800                                 | 14900                               |
| 22    | 90                         | 230                                  | 56                                  | 1200                       | 3000                                 | 9720                                | 1350                       | 3600                                 | 13100                               |
| 23    | 80                         | 230                                  | 50                                  | 1000                       | 2000                                 | 5400                                | 1250                       | 3400                                 | 11500                               |
| 24    | 60                         | 225                                  | 36                                  | 900                        | 1500                                 | 3650                                | 1200                       | 3200                                 | 10400                               |
| 25    | 50                         | 225                                  | 30                                  | 800                        | 1100                                 | 2380                                | 1100                       | 3000                                 | 8910                                |
| 26    | 45                         | 220                                  | 27                                  | 700                        | 800                                  | 1510                                | 1050                       | 3100                                 | 8790                                |
| 27    | 45                         | 215                                  | 26                                  | 800                        | 500                                  | 1080                                | 1000                       | 2900                                 | 7830                                |
| 28    | 45                         | 215                                  | 26                                  | 1000                       | 1000                                 | 2700                                | 950                        | 2800                                 | 7180                                |
| 29    | 50                         | 210                                  | 28                                  | 2500                       | 2000                                 | 13500                               | 1100                       | 3000                                 | 8910                                |
| 30    | 55                         | 205                                  | 30                                  | --                         | --                                   | --                                  | 1100                       | 3000                                 | 8910                                |
| 31    | 56                         | 200                                  | 30                                  | --                         | --                                   | --                                  | 1100                       | 3000                                 | 8910                                |
| TOTAL | 2816                       | --                                   | 1957                                | 12657                      | --                                   | 53799                               | 70400                      | --                                   | 931940                              |

## CHEYENNE RIVER BASIN

06439300 CHEYENNE RIVER AT CHERRY CREEK, S. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| 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     | 1050                 | 2800                      | 7940                          |                      |                           |                               |                      |                           |                               |
| 2     | 1050                 | 2800                      | 7940                          | 852                  | 4500                      | 10400                         | 1260                 | 8600                      | 29300                         |
| 3     | 1000                 | 2700                      | 7290                          | 938                  | 1200                      | 3040                          | 1200                 | 7100                      | 23000                         |
| 4     | 880                  | 2600                      | 6180                          | 1560                 | 10200                     | 43000                         | 1090                 | 5800                      | 17100                         |
| 5     | 850                  | 2500                      | 5740                          | 2810                 | 16200                     | 123000                        | 980                  | 4800                      | 12700                         |
|       |                      |                           |                               | 2270                 | 9600                      | 58800                         | 886                  | 3700                      | 8850                          |
| 6     | 800                  | 2200                      | 4750                          | 1600                 | 5800                      | 25100                         | 818                  | 2900                      | 6400                          |
| 7     | 734                  | 2000                      | 3960                          | 1120                 | 3700                      | 11200                         | 810                  | 2200                      | 4810                          |
| 8     | 701                  | 1700                      | 3220                          | 946                  | 2700                      | 6900                          | 784                  | 1600                      | 3390                          |
| 9     | 661                  | 1400                      | 2500                          | 938                  | 2000                      | 5070                          | 742                  | 1200                      | 2400                          |
| 10    | 610                  | 1100                      | 1810                          | 1030                 | 1800                      | 5010                          | 631                  | 900                       | 1530                          |
| 11    | 603                  | 980                       | 1600                          |                      | 2600                      | 11900                         | 3680                 | 11000                     | 109000                        |
| 12    | 569                  | 860                       | 1320                          |                      | 18200                     | 298000                        | 14400                | 65000                     | 2530000                       |
| 13    | 558                  | 740                       | 1110                          |                      | 7260                      |                               | 8190                 | 40000                     | 885000                        |
| 14    | 541                  | 620                       | 906                           |                      | 4750                      | 176000                        | 5280                 | 29000                     | 413000                        |
| 15    | 569                  | 500                       | 768                           |                      | 4450                      | 120000                        | 4080                 | 23000                     | 253000                        |
| 16    | 569                  | 380                       | 584                           |                      | 3220                      | 7800                          | 3160                 | 20000                     | 171000                        |
| 17    | 685                  | 259                       | 479                           |                      | 2120                      | 6200                          | 2320                 | 16000                     | 100000                        |
| 18    | 589                  | 265                       | 421                           |                      | 1600                      | 4900                          | 2220                 | 13000                     | 77900                         |
| 19    | 524                  | 270                       | 382                           |                      | 1330                      | 3900                          | 2280                 | 13000                     | 80000                         |
| 20    | 508                  | 272                       | 373                           |                      | 1120                      | 2900                          | 4970                 | 31000                     | 416000                        |
| 21    | 518                  | 250                       | 350                           |                      | 980                       | 2500                          |                      |                           |                               |
| 22    | 494                  | 230                       | 307                           |                      | 5670                      | 39000                         | 8770                 | 62000                     | 1470000                       |
| 23    | 386                  | 200                       | 208                           |                      | 4110                      | 16000                         | 7360                 | 36000                     | 715000                        |
| 24    | 412                  | 1500                      | 1670                          |                      | 3040                      | 7000                          | 4830                 | 15000                     | 196000                        |
| 25    | 450                  | 1000                      | 1220                          |                      | 1910                      | 4000                          | 3660                 | 8200                      | 81000                         |
|       |                      |                           |                               |                      |                           |                               | 2930                 | 5000                      | 39600                         |
| 26    | 442                  | 792                       | 945                           |                      | 4420                      | 37000                         | 2840                 | 4000                      | 30700                         |
| 27    | 466                  | 650                       | 818                           |                      | 3020                      | 28000                         | 4260                 | 5100                      | 58700                         |
| 28    | 570                  | 3200                      | 4920                          |                      | 1700                      | 16000                         | 4240                 | 3250                      | 37200                         |
| 29    | 1760                 | 42500                     | 202000                        |                      | 1700                      | 15000                         | 3220                 | 1450                      | 12600                         |
| 30    | 810                  | 9500                      | 20800                         |                      | 1750                      | 15000                         | 2980                 | 1250                      | 10100                         |
| 31    | --                   | --                        | --                            |                      | 1370                      | 10000                         | --                   | --                        | --                            |
| TOTAL | 20359                | --                        | 292511                        | 77344                | --                        | 3271610                       | 104871               | --                        | 7795280                       |
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CHEYENNE RIVER BASIN

71

06439300 CHEYENNE RIVER AT CHERRY CREEK, S. DAK.--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEDUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE-<br>MENT<br>DIS-<br>CHARGE<br>(MG/L)<br>(80154) | SUS-<br>PENDE-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.002 MM<br>(70337) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.004 MM<br>(70338) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.016 MM<br>(70340) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(70342) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM<br>(70343) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM<br>(70344) |
|---------------|------|----------------------------------------|----------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| JULY<br>05... | 1700 | 23.0                                   | 1510                                                     | 1080                                                          | 4400                                                           | 45                                                                     | 56                                                                     | 80                                                                     | 95                                                                     | 97                                                                     | 100                                                                    |

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | NUMBER<br>OF<br>SAM-<br>PLING<br>POINTS<br>(00063) | INSTAN-<br>TANEDUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(80158) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM<br>(80159) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM<br>(80160) |
|---------------|------|----------------------------------------|----------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|
| SEP.<br>01... | 1300 | 23.0                                   | 1                                                  | 419                                                      | 0                                                                     | 2                                                                     | 9                                                                     |
| 06...         | 1300 | 22.0                                   | 1                                                  | 462                                                      | --                                                                    | 0                                                                     | 8                                                                     |
| 11...         | 1000 | --                                     | 0                                                  | 454                                                      | --                                                                    | 0                                                                     | 10                                                                    |

| DATE          | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM<br>(80161) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>1.00 MM<br>(80162) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>2.00 MM<br>(80169) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>4.00 MM<br>(80170) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>8.00 MM<br>(80171) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>16.0 MM<br>(80172) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>32.0 MM<br>(80173) |
|---------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|
| SEP.<br>01... | 24                                                                    | 44                                                                    | 62                                                                    | 82                                                                    | 94                                                                    | 100                                                                   | --                                                                    |
| 06...         | 45                                                                    | 82                                                                    | 91                                                                    | 95                                                                    | 100                                                                   | --                                                                    | --                                                                    |
| 11...         | 37                                                                    | 42                                                                    | 47                                                                    | 54                                                                    | 63                                                                    | 84                                                                    | 100                                                                   |

## MISSOURI RIVER BASIN

06440000 MISSOURI RIVER AT PIERRE, S. DAK.

LOCATION.--Lat 44°22'25", long 100°22'20", in SE¼ sec.21, T.5 N., R.31 E., Hughes County, at gaging station, near right bank on downstream side of pier of Chicago and North Western Transportation Co. bridge, 1.3 miles upstream from Bad River, 5.8 miles downstream from Oahe Dam, and at mile 1066.5.

DRAINAGE AREA.--243,500 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: July 1971 to September 1972.  
Water temperatures: July 1971 to September 1972.

## CHEMICAL ANALYSES, PERIOD JULY 1971 TO SEPTEMBER 1971

| DATE  | TIME     | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SiO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|-------|----------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JULY  |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31 | -- 44400 | --                                         | --                                                      | 59                                                          | 22                                                                 | 69                                                    | 5.0                                                               | 195                                             | 210                                                     | 10                                                           | --                                                          | .27                                                                      |
| AUG.  |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31 | -- 46500 | --                                         | --                                                      | 59                                                          | 21                                                                 | 67                                                    | 5.1                                                               | 189                                             | 210                                                     | 10                                                           | --                                                          | .26                                                                      |
| SEP.  |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30 | -- 39800 | --                                         | 6.3                                                     | 59                                                          | 21                                                                 | 69                                                    | 4.9                                                               | 183                                             | 230                                                     | 12                                                           | .4                                                          | .28                                                                      |

## ANALYSIS OF ADDITIONAL SAMPLES

|       |             |    |     |    |    |    |     |     |     |     |    |     |
|-------|-------------|----|-----|----|----|----|-----|-----|-----|-----|----|-----|
| JULY  |             |    |     |    |    |    |     |     |     |     |    |     |
| 22... | --A54200    | -- | --  | 60 | 22 | 71 | 4.0 | 195 | 200 | 8.9 | -- | .18 |
| AUG.  |             |    |     |    |    |    |     |     |     |     |    |     |
| 25... | 0830 A54000 | -- | 5.9 | 56 | 21 | 71 | 4.9 | 194 | 210 | 10  | .5 | .20 |

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME     | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SiO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|----------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 35100 | --                                         | 6.2                                                     | 55                                                          | 21                                                                 | 69                                                    | 4.8                                                               | 187                                             | 200                                                     | 11                                                           | .5                                                          | .28                                                                      |
| NOV.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | -- 37800 | --                                         | 6.2                                                     | 62                                                          | 24                                                                 | 68                                                    | 7.2                                                               | 193                                             | 210                                                     | 10                                                           | .5                                                          | .28                                                                      |
| DEC.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 26500 | --                                         | 6.9                                                     | 58                                                          | 21                                                                 | 69                                                    | 5.0                                                               | 197                                             | 210                                                     | 10                                                           | .5                                                          | .32                                                                      |
| JAN.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 24200 | --                                         | 6.5                                                     | 60                                                          | 22                                                                 | 71                                                    | 5.1                                                               | 198                                             | 220                                                     | 10                                                           | .5                                                          | .29                                                                      |
| FEB.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | -- 22800 | --                                         | 6.4                                                     | 59                                                          | 22                                                                 | 69                                                    | 4.9                                                               | 195                                             | 220                                                     | 9.4                                                          | .4                                                          | .19                                                                      |
| MAR.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 28600 | --                                         | 6.4                                                     | 58                                                          | 23                                                                 | 67                                                    | 4.8                                                               | 193                                             | 210                                                     | 8.9                                                          | .6                                                          | .14                                                                      |
| APR.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | -- 38400 | --                                         | 6.8                                                     | 54                                                          | 24                                                                 | 71                                                    | 5.0                                                               | 188                                             | 220                                                     | 10                                                           | .5                                                          | .14                                                                      |
| MAY                 |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 28100 | --                                         | 6.2                                                     | 57                                                          | 22                                                                 | 66                                                    | 4.9                                                               | 192                                             | 210                                                     | 10                                                           | .6                                                          | .18                                                                      |
| JUNE                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | -- 35800 | --                                         | 6.0                                                     | 54                                                          | 22                                                                 | 67                                                    | 4.7                                                               | 191                                             | 200                                                     | 11                                                           | .5                                                          | .16                                                                      |
| JULY                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 36400 | --                                         | 6.1                                                     | 56                                                          | 22                                                                 | 58                                                    | 4.9                                                               | 183                                             | 200                                                     | 9.3                                                          | .6                                                          | .21                                                                      |
| AUG.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | -- 41600 | --                                         | 6.0                                                     | 54                                                          | 21                                                                 | 63                                                    | 4.8                                                               | 182                                             | 190                                                     | 8.9                                                          | .5                                                          | .21                                                                      |
| SEP.                |          |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 16-30               | -- 42200 | --                                         | 6.4                                                     | 53                                                          | 19                                                                 | 64                                                    | 5.1                                                               | 180                                             | 190                                                     | 8.2                                                          | .5                                                          | .31                                                                      |
| WTD. AVG.           | --       | --                                         | 6.3                                                     | 57                                                          | 22                                                                 | 67                                                    | 5.1                                                               | 189                                             | 206                                                     | 9.8                                                          | .5                                                          | .22                                                                      |
| TOT. LOAD<br>(TONS) | --       | --                                         | 196000                                                  | 1754000                                                     | 683000                                                             | 2067000                                               | 159000                                                            | 5878000                                         | 6391000                                                 | 303000                                                       | 16100                                                       | 6880                                                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|       |             |    |     |    |    |    |     |     |     |     |    |     |
|-------|-------------|----|-----|----|----|----|-----|-----|-----|-----|----|-----|
| AUG.  |             |    |     |    |    |    |     |     |     |     |    |     |
| 29... | 1125 A53300 | -- | 6.2 | 52 | 20 | 64 | 4.5 | 171 | 200 | 7.9 | .5 | .13 |
| SEP.  |             |    |     |    |    |    |     |     |     |     |    |     |
| 29... | 1000 A52700 | -- | 6.6 | 53 | 19 | 64 | 4.7 | 176 | 200 | 9.0 | .5 | .18 |

NOTE.--Carbonate (CO3) analysis for all samples, 0.0 mg/l.  
A Discharge at time of sampling.

## 06440000 MISSOURI RIVER AT PIERRE, S. DAK.--Continued

## EXTREMES.--July 1971 to September 1972:

Dissolved solids: Maximum, 494 mg/l Sept. 1-30, 1971, Jan. 1-31, 1972; minimum, 436 mg/l Sept. 16-30, 1972.  
 Hardness: Maximum, 250 mg/l Nov. 1-30, 1971; minimum, 210 mg/l Sept. 16-30, 1972.

REMARKS.--Daily samples for chemical analysis composited by discharge. Maximum observed during period:  
 Specific conductance, daily, 795 micromhos Jan. 15; water temperatures, 25.0°C Aug. 27, 1971. Minimum  
 observed during period: Specific conductance, daily, 640 micromhos Aug. 23, 1972; water temperatures,  
 freezing point Dec. 15, 28. Additional samples collected for more comprehensive definition of water  
 quality. Discharge furnished by District office, Corps of Engineers, Omaha, Nebr.

## CHEMICAL ANALYSES, PERIOD JULY 1971 TO SEPTEMBER 1971

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS)<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS)<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(03400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| JULY<br>01-31 | --                                                                  | .070                                                 | 470                                                 | --                                                                        | .63                                                            | --                                                           | 240                                            | 78                                                           | 1.9                                                | 755                                                                   | 7.4                      | --                                     |
| AUG.<br>01-31 | --                                                                  | .040                                                 | 300                                                 | --                                                                        | .65                                                            | --                                                           | 230                                            | 79                                                           | 1.9                                                | 744                                                                   | 7.9                      | --                                     |
| SEP.<br>01-30 | --                                                                  | --                                                   | 150                                                 | 494                                                                       | .67                                                            | 53100                                                        | 230                                            | 84                                                           | 2.0                                                | 744                                                                   | 8.1                      | --                                     |

## ANALYSIS OF ADDITIONAL SAMPLES

|               |    |      |     |     |     |       |     |    |     |     |     |    |
|---------------|----|------|-----|-----|-----|-------|-----|----|-----|-----|-----|----|
| JULY<br>22... | -- | .000 | 140 | --  | .66 | --    | 240 | 80 | 2.0 | 706 | 7.9 | -- |
| AUG.<br>25... | -- | .050 | 120 | 476 | .65 | 69400 | 230 | 67 | 2.1 | 718 | 8.2 | -- |

## TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                        | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS)<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS)<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(03400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|-----------------------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>01-31               | --                                                                  | .030                                                 | 120                                                 | 461                                                                       | .63                                                            | 43700                                                        | 220                                            | 70                                                           | 2.0                                                | 736                                                                   | 8.2                      | --                                     |
| NOV.<br>01-30               | --                                                                  | --                                                   | 130                                                 | 484                                                                       | .66                                                            | 49400                                                        | 250                                            | 95                                                           | 1.9                                                | 727                                                                   | 8.1                      | --                                     |
| DEC.<br>01-31               | .010                                                                | .10                                                  | 50                                                  | 479                                                                       | .65                                                            | 34300                                                        | 230                                            | 70                                                           | 2.0                                                | 732                                                                   | 9.1                      | --                                     |
| JAN.<br>01-31               | .020                                                                | .020                                                 | 120                                                 | 494                                                                       | .67                                                            | 32300                                                        | 240                                            | 78                                                           | 2.0                                                | 734                                                                   | 7.9                      | --                                     |
| FEB.<br>01-29               | .050                                                                | .060                                                 | 150                                                 | 488                                                                       | .66                                                            | 30000                                                        | 240                                            | 78                                                           | 1.9                                                | 744                                                                   | 8.1                      | --                                     |
| MAR.<br>01-31               | .020                                                                | .050                                                 | 140                                                 | 474                                                                       | .64                                                            | 36600                                                        | 240                                            | 81                                                           | 1.9                                                | 752                                                                   | 7.9                      | --                                     |
| APR.<br>01-30               | .040                                                                | .040                                                 | 140                                                 | 485                                                                       | .66                                                            | 50300                                                        | 230                                            | 79                                                           | 2.0                                                | 746                                                                   | 8.0                      | --                                     |
| MAY<br>01-31                | .020                                                                | .020                                                 | 140                                                 | 472                                                                       | .64                                                            | 35800                                                        | 230                                            | 75                                                           | 1.9                                                | 733                                                                   | 8.0                      | --                                     |
| JUNE<br>01-30               | .060                                                                | .070                                                 | 130                                                 | 460                                                                       | .63                                                            | 44500                                                        | 230                                            | 69                                                           | 1.9                                                | 725                                                                   | 7.6                      | --                                     |
| JULY<br>01-31               | .040                                                                | .020                                                 | 130                                                 | 448                                                                       | .61                                                            | 44000                                                        | 230                                            | 80                                                           | 1.7                                                | 710                                                                   | 8.2                      | --                                     |
| AUG.<br>01-31               | .020                                                                | .010                                                 | 140                                                 | 439                                                                       | .60                                                            | 49300                                                        | 220                                            | 72                                                           | 1.8                                                | 714                                                                   | 7.7                      | --                                     |
| SEP.<br>16-30               | .020                                                                | .070                                                 | 120                                                 | 436                                                                       | .59                                                            | 49700                                                        | 210                                            | 63                                                           | 1.9                                                | 688                                                                   | 8.1                      | --                                     |
| WTD. AVG.<br>TIME WTD.      | B.031                                                               | C.042                                                | 127                                                 | 467                                                                       | .64                                                            | --                                                           | 231                                            | 76                                                           | 1.9                                                | 728                                                                   | 8.0                      | --                                     |
| AVG.<br>TOT. LOAD<br>(TONS) | B.031                                                               | C.044                                                | 126                                                 | 470                                                                       | .64                                                            | --                                                           | 232                                            | 76                                                           | 1.9                                                | 730                                                                   | 8.0                      | --                                     |
|                             | B771                                                                | C1170                                                | 3940                                                | 14496000                                                                  | --                                                             | --                                                           | --                                             | --                                                           | --                                                 | --                                                                    | --                       | --                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|               |      |      |    |     |     |       |     |    |     |     |     |      |
|---------------|------|------|----|-----|-----|-------|-----|----|-----|-----|-----|------|
| AUG.<br>29... | .020 | .030 | -- | 440 | .63 | 63300 | 210 | 72 | 1.9 | 684 | 9.1 | 20.6 |
| SEP.<br>29... | .010 | .030 | -- | 445 | .54 | 63300 | 210 | 66 | 1.9 | 684 | 8.0 | 15.4 |

B Based on 305 days of chemical analysis.

C Based on 336 days of chemical analysis.

## MISSOURI RIVER BASIN

06440000 MISSOURI RIVER AT PIERRE, S. DAK.--Continued

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), PERIOD JULY 1971 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 740 | 725 | 710 |
| 2   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 730 | 709 |
| 3   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 740 | 730 | 710 |
| 4   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 740 | 725 | 710 |
| 5   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 710 |
| 6   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 740 | 730 | 716 |
| 7   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 730 | 709 |
| 8   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 725 | 709 |
| 9   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 725 | 711 |
| 10  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 720 | 709 |
| 11  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 720 | 715 |
| 12  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 720 | 713 |
| 13  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 713 |
| 14  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 709 |
| 15  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 740 | 725 | 710 |
| 16  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 712 |
| 17  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 740 | 720 | 712 |
| 18  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 720 | 709 |
| 19  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 712 |
| 20  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 712 |
| 21  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 725 | 712 |
| 22  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 725 | 712 |
| 23  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 735 | 725 | 712 |
| 24  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 720 | 716 |
| 25  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 720 | 715 |
| 26  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 720 | 719 |
| 27  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 725 | 725 | 715 |
| 28  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 725 | 716 |
| 29  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 725 | 720 | 716 |
| 30  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 725 | 720 | 716 |
| 31  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 730 | 720 | --- |
| AVG | --- | --- | --- | --- | --- | --- | --- | --- | --- | 733 | 724 | 712 |

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN | FEB  | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|-----|------|------|------|-----|------|-----|-----|-----|-----|-----|-----|-----|
| 1   | 735  | 758  | 745  | --- | ---  | 750 | --- | 700 | 680 | 660 | 660 | --- |
| 2   | ---  | 758  | 740  | 770 | ---  | 760 | 750 | 700 | 680 | 660 | 660 | --- |
| 3   | 740  | 754  | 740  | 770 | ---  | 760 | 720 | 700 | 680 | 660 | 670 | --- |
| 4   | 733  | 754  | 740  | 770 | 710  | 750 | 720 | 700 | 680 | 660 | 670 | --- |
| 5   | 733  | 753  | 760  | 760 | 720  | --- | 720 | 700 | 680 | 660 | 670 | --- |
| 6   | 733  | 763  | 740  | 770 | ---  | 750 | 720 | 700 | 680 | 660 | --- | --- |
| 7   | 746  | 763  | ---  | 770 | 695  | 760 | 680 | 700 | 680 | 660 | 670 | --- |
| 8   | 738  | 759  | 740  | 770 | 710  | 750 | 720 | 700 | 680 | 660 | 660 | --- |
| 9   | 758  | 755  | ---  | 770 | 710  | 760 | 720 | 700 | 680 | 650 | 670 | --- |
| 10  | 744  | 754  | 740  | 770 | 710  | 750 | 720 | 700 | 680 | 660 | 670 | --- |
| 11  | 734  | 758  | 740  | 770 | 700  | --- | 720 | 700 | 680 | 650 | 670 | --- |
| 12  | 734  | 760  | 735  | 765 | 710  | --- | --- | 700 | 680 | 650 | 660 | --- |
| 13  | 738  | 760  | 720  | 775 | 710  | 750 | 710 | 700 | 680 | 650 | 660 | --- |
| 14  | 738  | 758  | 720  | --- | 710  | 760 | --- | 700 | 670 | 660 | --- | --- |
| 15  | 738  | 758  | 750  | 795 | 710  | --- | 720 | 700 | 670 | --- | --- | --- |
| 16  | 742  | 756  | 740  | 760 | 740  | 760 | --- | 700 | 670 | --- | 670 | 705 |
| 17  | 734  | 758  | 740  | 770 | 710  | 760 | 720 | 700 | 670 | --- | 670 | 705 |
| 18  | 734  | 758  | 730  | 775 | 710  | 760 | --- | 700 | 670 | 660 | --- | 705 |
| 19  | 737  | 758  | 720  | 765 | 715  | --- | --- | 700 | 670 | 660 | 670 | 715 |
| 20  | 735  | 756  | 715  | 770 | 710  | 750 | 710 | 700 | 670 | 660 | --- | 710 |
| 21  | 736  | 758  | 715  | 770 | 710  | 760 | --- | 700 | 670 | 660 | 660 | 725 |
| 22  | 733  | 758  | 710  | --- | 680  | 750 | 720 | 700 | 670 | --- | --- | 725 |
| 23  | 733  | 763  | 700  | --- | ---  | --- | 710 | 700 | 670 | --- | 640 | 725 |
| 24  | 746  | 757  | 730  | --- | 710  | 760 | --- | 700 | 670 | 660 | --- | 725 |
| 25  | 737  | 759  | ---  | --- | ---  | 760 | --- | 690 | 670 | 660 | --- | 720 |
| 26  | 740  | 763  | 730  | --- | 715  | 770 | 710 | 690 | 670 | 660 | --- | 720 |
| 27  | 745  | ---  | 730  | --- | 720  | 760 | 710 | 690 | 670 | 660 | --- | 720 |
| 28  | 745  | 762  | 720  | --- | 710  | --- | 710 | 690 | 660 | 660 | --- | 720 |
| 29  | 738  | 758  | 720  | 780 | 710  | 750 | --- | 690 | 660 | --- | --- | 720 |
| 30  | ---  | ---  | 720  | 780 | ---  | 750 | --- | 690 | 660 | --- | --- | 715 |
| 31  | 740  | ---  | 710  | 780 | ---  | --- | --- | 690 | --- | --- | --- | --- |
| AVG | F739 | E758 | E730 | --- | D710 | --- | --- | 698 | 673 | --- | --- | --- |

D Based on 23 days of data.

E Based on 28 days of data.

F Based on 29 days of data.

## MISSOURI RIVER BASIN

75

06440000 MISSOURI RIVER AT PIERRE, S. DAK.--Continued

TEMPERATURE (°C) OF WATER, PERIOD JULY 1971 TO SEPTEMBER 1971

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL  | AUG   | SEP  |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|-------|------|
| 1   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18.0 | 18.5  | 22.0 |
| 2   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18.0 | 20.0  | 22.0 |
| 3   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 17.0 | 16.0  | 22.0 |
| 4   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15.0 | 19.0  | 22.0 |
| 5   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 17.5 | 17.0  | 20.5 |
| 6   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 17.0 | 18.0  | 22.0 |
| 7   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 14.0 | 20.0  | 22.0 |
| 8   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 17.0 | 21.0  | 20.5 |
| 9   | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19.0 | 20.0  | 20.5 |
| 10  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15.5 | 21.0  | 20.5 |
| 11  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 13.0 | 21.0  | 21.0 |
| 12  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18.5 | 21.0  | 20.5 |
| 13  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 15.0 | 20.0  | 21.0 |
| 14  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 19.0  | 20.0 |
| 15  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 19.0  | 19.5 |
| 16  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 19.0  | 19.5 |
| 17  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19.5 | 19.0  | 20.0 |
| 18  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 18.5 | 18.0  | 20.0 |
| 19  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 21.0  | 19.0 |
| 20  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 20.0  | 19.5 |
| 21  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 20.0  | 18.5 |
| 22  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | ---   | 18.5 |
| 23  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 21.0 | 22.0  | 18.5 |
| 24  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19.5 | 21.0  | 18.0 |
| 25  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19.0 | 22.0  | 17.0 |
| 26  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 22.0  | 17.5 |
| 27  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 22.0 | 25.0  | 17.5 |
| 28  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 21.5 | 19.0  | 18.0 |
| 29  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 21.5 | 21.0  | 18.0 |
| 30  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 18.0  | 17.5 |
| 31  | --- | --- | --- | --- | --- | --- | --- | --- | --- | 20.0 | 21.0  | ---  |
| AVG | --- | --- | --- | --- | --- | --- | --- | --- | --- | 19.0 | G20.0 | 20.0 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV   | DEC  | JAN | FEB  | MAR | APR | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|-------|------|-----|------|-----|-----|------|------|------|------|------|
| 1   | 14.0 | 9.0   | 8.5  | --- | ---  | 2.0 | --- | 6.0  | 12.5 | 17.0 | 19.0 | ---  |
| 2   | ---  | 11.5  | 7.0  | 2.5 | ---  | 1.5 | 5.0 | 8.0  | 12.5 | 17.0 | 13.0 | ---  |
| 3   | 16.5 | 12.0  | 7.0  | 3.0 | ---  | 2.0 | 4.0 | 7.0  | 12.0 | 18.5 | 17.0 | ---  |
| 4   | 16.0 | 12.0  | 7.0  | 2.0 | 2.0  | 3.0 | 3.5 | 6.5  | 11.5 | 18.5 | 13.0 | ---  |
| 5   | 17.0 | 10.0  | 8.0  | 4.0 | 2.5  | --- | 7.0 | 7.0  | 12.5 | 18.0 | 19.0 | ---  |
| 6   | 13.0 | 9.0   | 7.0  | 4.0 | ---  | 3.0 | 6.0 | 6.0  | 13.0 | 18.0 | 20.5 | ---  |
| 7   | 11.0 | 8.5   | ---  | 4.0 | 1.0  | 3.0 | 5.0 | 6.0  | 11.0 | 17.0 | 20.5 | ---  |
| 8   | 10.0 | 10.0  | 8.0  | 4.0 | 1.5  | 3.5 | 6.5 | 7.0  | 11.0 | 17.0 | 20.0 | ---  |
| 9   | 15.0 | 11.0  | ---  | 3.0 | 2.5  | 4.0 | 6.0 | 6.5  | 11.5 | 18.0 | 20.5 | ---  |
| 10  | 15.0 | 11.0  | 4.0  | 3.0 | 2.0  | 4.0 | 4.5 | 6.5  | 10.0 | 17.0 | 20.5 | ---  |
| 11  | 15.0 | 10.0  | 1.5  | 2.5 | 2.5  | --- | 4.0 | 6.5  | 11.5 | 16.5 | 18.5 | ---  |
| 12  | 15.0 | 10.5  | 5.0  | 1.0 | 3.0  | --- | --- | 7.0  | 12.0 | 19.5 | 20.0 | ---  |
| 13  | 17.0 | 10.0  | 6.0  | 1.0 | 3.0  | 3.5 | 6.0 | 7.0  | 11.5 | 19.0 | 19.5 | ---  |
| 14  | 15.0 | 11.0  | 6.0  | --- | 2.5  | 5.0 | --- | 7.5  | 11.0 | 17.5 | ---  | ---  |
| 15  | 14.0 | 10.5  | 0.0  | 1.0 | 2.5  | --- | 6.5 | 8.0  | 12.0 | ---  | ---  | ---  |
| 16  | 9.5  | 10.5  | 5.0  | 3.0 | 3.5  | 5.0 | --- | 8.5  | 13.5 | ---  | 20.0 | 20.5 |
| 17  | 9.5  | 11.0  | 3.0  | 3.5 | 3.5  | 4.0 | 5.0 | 9.0  | 13.0 | ---  | 20.0 | 19.5 |
| 18  | 10.0 | 9.0   | 1.0  | 1.0 | 2.0  | 5.0 | --- | 9.0  | 11.5 | 21.5 | ---  | 18.0 |
| 19  | 15.0 | 9.5   | 6.0  | 1.0 | 3.5  | --- | --- | 9.0  | 13.5 | 18.5 | 22.0 | 20.0 |
| 20  | 15.0 | 10.0  | 7.0  | 1.5 | 3.5  | 4.5 | 5.0 | 9.5  | 10.5 | 12.5 | ---  | 19.5 |
| 21  | 15.0 | 8.0   | 5.0  | 2.0 | 2.5  | 5.5 | --- | 13.0 | 16.0 | 22.0 | 22.0 | 19.5 |
| 22  | 15.0 | 9.5   | 4.0  | --- | 2.0  | 5.5 | 4.5 | 9.0  | 14.5 | ---  | ---  | 19.5 |
| 23  | 8.0  | 9.0   | 4.5  | --- | ---  | --- | 6.5 | 9.0  | 11.5 | ---  | 23.0 | 18.5 |
| 24  | 15.0 | 10.0  | 5.0  | --- | 3.0  | 5.0 | --- | 9.5  | 8.5  | 19.5 | 20.0 | 18.0 |
| 25  | 14.0 | 8.0   | ---  | --- | ---  | 4.5 | --- | 10.0 | 11.5 | 19.0 | ---  | 18.0 |
| 26  | 15.0 | 9.0   | 3.0  | --- | 3.0  | 5.0 | 5.5 | 9.0  | 14.5 | 12.0 | ---  | 18.0 |
| 27  | 13.0 | ---   | 4.5  | --- | 3.5  | 6.0 | 7.0 | 11.0 | 14.5 | 19.0 | ---  | 15.5 |
| 28  | 13.0 | 9.0   | 0.0  | --- | 2.5  | --- | 7.5 | 13.0 | 16.5 | 12.5 | ---  | 18.0 |
| 29  | 12.0 | 8.5   | 3.0  | 2.0 | 2.5  | 5.0 | --- | 13.5 | 18.0 | ---  | ---  | 17.5 |
| 30  | ---  | ---   | 4.0  | 2.0 | ---  | 5.5 | --- | 13.0 | 17.0 | ---  | ---  | 18.0 |
| 31  | 12.0 | ---   | ---  | 3.0 | ---  | --- | --- | 12.5 | ---  | ---  | ---  | ---  |
| AVG | 13.5 | E10.0 | E5.0 | --- | D2.5 | --- | --- | 8.5  | 12.5 | ---  | ---  | ---  |

D Based on 23 days of data.

E Based on 28 days of data.

F Based on 29 days of data.

G Based on 30 days of data.



## BAD RIVER BASIN

06441500 BAD RIVER NEAR FORT PIERRE, S. DAK.

LOCATION.--Lat 44°19'36", long 100°23'02", in NW¼NW¼ sec.10, T.4 N., R.31 E., Stanley County, at gaging station, on right bank at downstream side of highway bridge, 2.1 miles south of Fort Pierre, 4.3 miles downstream from Willow Creek, and 6.0 miles upstream from mouth.

DRAINAGE AREA.--3,107 sq mi.

PERIOD OF RECORD.--Sediment records: October 1971 to September 1972.

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | OCTOBER                    |                                 |                                     | NOVEMBER                   |                                 |                                     | DECEMBER                   |                                 |                                     |
|-------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|----------------------------|---------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCENTRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 0                          | 0                               | 0                                   | 6.6                        | 15                              | .27                                 | 3.0                        | 20                              | .16                                 |
| 2     | 0                          | 0                               | 0                                   | 7.9                        | 15                              | .32                                 | 2.5                        | 20                              | .14                                 |
| 3     | 0                          | 0                               | 0                                   | 5.8                        | 15                              | .23                                 | 2.3                        | 20                              | .12                                 |
| 4     | 0                          | 0                               | 0                                   | 3.6                        | 15                              | .15                                 | 2.1                        | 20                              | .11                                 |
| 5     | 26                         | 250                             | 18                                  | 3.8                        | 15                              | .15                                 | 2.1                        | 20                              | .11                                 |
| 6     | 1.1                        | 380                             | 1.1                                 | 3.8                        | 15                              | .15                                 | 2.1                        | 15                              | .09                                 |
| 7     | .42                        | 220                             | .25                                 | 1.4                        | 15                              | .06                                 | 2.0                        | 15                              | .08                                 |
| 8     | .06                        | 150                             | .02                                 | .92                        | 13                              | .03                                 | 1.6                        | 15                              | .06                                 |
| 9     | 0                          | 0                               | 0                                   | .54                        | 13                              | .02                                 | 1.4                        | 15                              | .06                                 |
| 10    | 0                          | 0                               | 0                                   | .54                        | 13                              | .02                                 | 1.2                        | 15                              | .05                                 |
| 11    | 0                          | 0                               | 0                                   | .36                        | 13                              | .01                                 | 1.2                        | 15                              | .05                                 |
| 12    | 0                          | 0                               | 0                                   | 0                          | 0                               | 0                                   | 1.2                        | 15                              | .05                                 |
| 13    | 4.1                        | 340                             | 3.8                                 | 0                          | 0                               | 0                                   | 1.2                        | 15                              | .05                                 |
| 14    | 2.2                        | 170                             | 1.0                                 | .30                        | 10                              | .01                                 | 1.2                        | 15                              | .05                                 |
| 15    | 1.4                        | 120                             | .45                                 | 4.4                        | 20                              | .24                                 | 1.1                        | 15                              | .04                                 |
| 16    | 1.1                        | 90                              | .27                                 | 8.3                        | 30                              | .67                                 | 1.1                        | 15                              | .04                                 |
| 17    | .76                        | 70                              | .14                                 | 8.3                        | 40                              | .90                                 | 1.0                        | 12                              | .03                                 |
| 18    | .76                        | 60                              | .12                                 | 8.8                        | 40                              | .95                                 | .80                        | 12                              | .03                                 |
| 19    | 11                         | 260                             | 7.7                                 | 7.5                        | 40                              | .81                                 | .60                        | 12                              | .02                                 |
| 20    | 8.8                        | 200                             | 4.8                                 | 4.9                        | 35                              | .46                                 | .40                        | 12                              | .01                                 |
| 21    | 3.6                        | 25                              | .24                                 | 4.9                        | 35                              | .46                                 | .30                        | 10                              | .01                                 |
| 22    | 1.7                        | 25                              | .11                                 | 4.4                        | 35                              | .42                                 | .30                        | 10                              | .01                                 |
| 23    | .60                        | 25                              | .04                                 | 3.8                        | 30                              | .31                                 | .30                        | 10                              | .01                                 |
| 24    | 5.2                        | 130                             | 1.8                                 | 3.0                        | 30                              | .24                                 | .30                        | 10                              | .01                                 |
| 25    | 33                         | 310                             | 28                                  | 2.7                        | 30                              | .22                                 | .20                        | 10                              | .01                                 |
| 26    | 21                         | 40                              | 2.3                                 | 2.5                        | 25                              | .17                                 | .20                        | 10                              | .01                                 |
| 27    | 15                         | 35                              | 1.4                                 | 2.5                        | 25                              | .17                                 | .10                        | 10                              | 0                                   |
| 28    | 12                         | 30                              | .97                                 | 3.0                        | 25                              | .20                                 | .10                        | 10                              | 0                                   |
| 29    | 10                         | 25                              | .68                                 | 4.6                        | 20                              | .25                                 | 0                          | 0                               | 0                                   |
| 30    | 7.9                        | 20                              | .43                                 | 4.0                        | 20                              | .22                                 | 0                          | 0                               | 0                                   |
| 31    | 4.4                        | 20                              | .24                                 | --                         | --                              | --                                  | 0                          | 0                               | 0                                   |
| TOTAL | 172.10                     | --                              | 73.86                               | 113.16                     | --                              | 8.11                                | 31.90                      | --                              | 1.41                                |

## BAD RIVER BASIN

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06441500 BAD RIVER NEAR FORT PIERRE, S. DAK.--Continued

## EXTREMES.--1971-72:

Sediment concentrations: Maximum daily, 39,800 mg/l May 2; minimum daily, no flow for many days.

Sediment discharge: Maximum daily, 783,000 tons May 2; minimum daily, 0 tons on many days during October to February and July to September.

REMARKS.--Records fair. Flow affected by ice Nov. 30 to Mar. 5. No flow Oct. 1-4, 9-12, Nov. 12, 13, Dec. 29 to Feb. 17, July 8-10, Aug. 25 to Sept. 30. Suspended-sediment concentrations prior to July furnished by District office, Corps of Engineers, Omaha, Nebr. Sediment-discharge records prior to Oct. 1, 1971, are on file in the District office, Corps of Engineers, Omaha, Nebr. Miscellaneous samples for chemical data published for water years 1946-53.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | JANUARY                    |                                      |                                     | FEBRUARY                   |                                      |                                     | MARCH                      |                                      |                                     |
|-------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 1500                       | 3150                                 | 12800                               |
| 2     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 1000                       | 2350                                 | 6350                                |
| 3     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 900                        | 1600                                 | 3890                                |
| 4     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 800                        | 1300                                 | 2810                                |
| 5     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 800                        | 1200                                 | 2590                                |
| 6     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 1000                       | 1500                                 | 4050                                |
| 7     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 1500                       | 10600                                | 42900                               |
| 8     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 800                        | 4800                                 | 10400                               |
| 9     | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 560                        | 3900                                 | 5900                                |
| 10    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 500                        | 6900                                 | 9320                                |
| 11    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 400                        | 18000                                | 19400                               |
| 12    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 350                        | 23200                                | 21900                               |
| 13    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 300                        | 22100                                | 17900                               |
| 14    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 270                        | 29100                                | 21200                               |
| 15    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 230                        | 28400                                | 17600                               |
| 16    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 185                        | 15700                                | 7840                                |
| 17    | 0                          | 0                                    | 0                                   | 0                          | 0                                    | 0                                   | 123                        | 7800                                 | 2590                                |
| 18    | 0                          | 0                                    | 0                                   | 20                         | 1500                                 | 81                                  | 91                         | 3890                                 | 956                                 |
| 19    | 0                          | 0                                    | 0                                   | 50                         | 2000                                 | 270                                 | 72                         | 2003                                 | 389                                 |
| 20    | 0                          | 0                                    | 0                                   | 75                         | 2180                                 | 441                                 | 61                         | 1430                                 | 236                                 |
| 21    | 0                          | 0                                    | 0                                   | 200                        | 1650                                 | 891                                 | 68                         | 1400                                 | 257                                 |
| 22    | 0                          | 0                                    | 0                                   | 450                        | 1350                                 | 1640                                | 48                         | 1360                                 | 176                                 |
| 23    | 0                          | 0                                    | 0                                   | 1050                       | 1230                                 | 3490                                | 31                         | 1100                                 | 92                                  |
| 24    | 0                          | 0                                    | 0                                   | 1200                       | 1150                                 | 3730                                | 24                         | 800                                  | 52                                  |
| 25    | 0                          | 0                                    | 0                                   | 1500                       | 1300                                 | 5270                                | 21                         | 500                                  | 28                                  |
| 26    | 0                          | 0                                    | 0                                   | 2000                       | 1950                                 | 10500                               | 20                         | 295                                  | 16                                  |
| 27    | 0                          | 0                                    | 0                                   | 2100                       | 2900                                 | 16400                               | 17                         | 283                                  | 13                                  |
| 28    | 0                          | 0                                    | 0                                   | 2000                       | 3750                                 | 20300                               | 13                         | 500                                  | 18                                  |
| 29    | 0                          | 0                                    | 0                                   | 1850                       | 3750                                 | 18700                               | 16                         | 750                                  | 32                                  |
| 30    | 0                          | 0                                    | 0                                   | --                         | --                                   | --                                  | 8.3                        | 400                                  | 9.0                                 |
| 31    | 0                          | 0                                    | 0                                   | --                         | --                                   | --                                  | 7.1                        | 213                                  | 4.1                                 |
| TOTAL | 0                          | --                                   | 0                                   | 12495                      | --                                   | 81713                               | 11715.4                    | --                                   | 211718.1                            |

## BAD RIVER BASIN

06441500 BAD RIVER NEAR FORT PIERRE, S. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| 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     | 6.2                  | 196                       | 3.3                           | 2750                 | 31200                     | 232000                        | 176                  | 2000                      | 950                           |
| 2     | 5.3                  | 180                       | 2.6                           | 7290                 | 39800                     | 783000                        | 117                  | 1550                      | 490                           |
| 3     | 4.9                  | 165                       | 2.2                           | 2910                 | 21000                     | 165000                        | 88                   | 1270                      | 302                           |
| 4     | 4.6                  | 153                       | 1.9                           | 1550                 | 13700                     | 57300                         | 73                   | 1080                      | 213                           |
| 5     | 4.4                  | 150                       | 1.8                           | 972                  | 10200                     | 26800                         | 79                   | 8300                      | 1770                          |
| 6     | 4.4                  | 145                       | 1.7                           | 559                  | 8200                      | 12400                         | 78                   | 16800                     | 3540                          |
| 7     | 4.1                  | 143                       | 1.6                           | 387                  | 7300                      | 7630                          | 45                   | 12300                     | 1490                          |
| 8     | 3.8                  | 140                       | 1.4                           | 250                  | 6800                      | 4590                          | 52                   | 12000                     | 1680                          |
| 9     | 3.6                  | 138                       | 1.3                           | 193                  | 6000                      | 3130                          | 27                   | 6000                      | 437                           |
| 10    | 3.3                  | 144                       | 1.3                           | 573                  | 7800                      | 12100                         | 21                   | 3600                      | 204                           |
| 11    | 3.3                  | 136                       | 1.2                           | 2670                 | 34400                     | 248000                        | 20                   | 2200                      | 119                           |
| 12    | 4.6                  | 180                       | 2.2                           | 1690                 | 26000                     | 119000                        | 18                   | 1200                      | 58                            |
| 13    | 4.9                  | 237                       | 3.1                           | 1120                 | 14800                     | 44800                         | 13                   | 500                       | 18                            |
| 14    | 6.6                  | 250                       | 4.5                           | 1630                 | 12000                     | 52800                         | 11                   | 200                       | 5.9                           |
| 15    | 5.3                  | 237                       | 3.4                           | 1260                 | 13200                     | 44900                         | 8.3                  | 84                        | 1.9                           |
| 16    | 4.6                  | 225                       | 2.8                           | 640                  | 11500                     | 19900                         | 6.6                  | 80                        | 1.4                           |
| 17    | 4.1                  | 212                       | 2.3                           | 367                  | 7000                      | 6940                          | 5.8                  | 78                        | 1.2                           |
| 18    | 3.8                  | 198                       | 2.0                           | 221                  | 3500                      | 2090                          | 5.8                  | 75                        | 1.2                           |
| 19    | 3.6                  | 185                       | 1.8                           | 151                  | 2200                      | 897                           | 7.5                  | 70                        | 1.4                           |
| 20    | 3.0                  | 170                       | 1.4                           | 107                  | 1500                      | 433                           | 80                   | 4300                      | 929                           |
| 21    | 2.7                  | 160                       | 1.2                           | 78                   | 1100                      | 232                           | 72                   | 3800                      | 739                           |
| 22    | 2.5                  | 150                       | 1.0                           | 67                   | 1000                      | 181                           | 31                   | 2100                      | 176                           |
| 23    | 2.2                  | 135                       | .80                           | 186                  | 7600                      | 3820                          | 29                   | 1800                      | 141                           |
| 24    | 1.6                  | 120                       | .52                           | 116                  | 13800                     | 4320                          | 24                   | 800                       | 52                            |
| 25    | 1.2                  | 100                       | .32                           | 72                   | 10000                     | 1940                          | 18                   | 760                       | 37                            |
| 26    | 1.9                  | 95                        | .49                           | 133                  | 14300                     | 5140                          | 15                   | 730                       | 30                            |
| 27    | 3.3                  | 80                        | .71                           | 433                  | 18800                     | 22000                         | 15                   | 690                       | 28                            |
| 28    | 5.3                  | 70                        | 1.0                           | 384                  | 13300                     | 13800                         | 14                   | 650                       | 25                            |
| 29    | 8.3                  | 134                       | 3.0                           | 710                  | 10000                     | 19200                         | 11                   | 620                       | 18                            |
| 30    | 105                  | 3700                      | 1050                          | 491                  | 5300                      | 6880                          | 7.5                  | 580                       | 12                            |
| 31    | --                   | --                        | --                            | 288                  | 3100                      | 2490                          | --                   | --                        | --                            |
| TOTAL | 222.4                | --                        | 1102.84                       | 30248                | --                        | 1923713                       | 1168.5               | --                        | 13471.0                       |

| 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     | 5.8                  | 540                       | 8.5                           | 77                   | 5400                      | 1120                          | 0                    | 0                         | 0                             |
| 2     | 4.6                  | 510                       | 6.3                           | 57                   | 4200                      | 646                           | 0                    | 0                         | 0                             |
| 3     | 4.1                  | 470                       | 5.2                           | 56                   | 2600                      | 393                           | 0                    | 0                         | 0                             |
| 4     | 3.6                  | 430                       | 4.2                           | 58                   | 2200                      | 345                           | 0                    | 0                         | 0                             |
| 5     | 3.0                  | 385                       | 3.1                           | 43                   | 1200                      | 139                           | 0                    | 0                         | 0                             |
| 6     | 2.0                  | 340                       | 1.8                           | 64                   | 3000                      | 518                           | 0                    | 0                         | 0                             |
| 7     | 1.6                  | 290                       | 1.3                           | 179                  | 7700                      | 3720                          | 0                    | 0                         | 0                             |
| 8     | 1.4                  | 230                       | .87                           | 82                   | 3800                      | 841                           | 0                    | 0                         | 0                             |
| 9     | 1.2                  | 180                       | .58                           | 50                   | 2500                      | 338                           | 0                    | 0                         | 0                             |
| 10    | 1.2                  | 130                       | .42                           | 35                   | 1700                      | 161                           | 0                    | 0                         | 0                             |
| 11    | .42                  | 70                        | .08                           | 23                   | 1000                      | 62                            | 0                    | 0                         | 0                             |
| 12    | 1.6                  | 300                       | 1.3                           | 17                   | 500                       | 23                            | 0                    | 0                         | 0                             |
| 13    | .92                  | 200                       | .50                           | 13                   | 212                       | 7.4                           | 0                    | 0                         | 0                             |
| 14    | .54                  | 100                       | .15                           | 9.8                  | 205                       | 5.4                           | 0                    | 0                         | 0                             |
| 15    | .30                  | 50                        | .04                           | 7.1                  | 196                       | 3.8                           | 0                    | 0                         | 0                             |
| 16    | .06                  | 50                        | .01                           | 4.9                  | 190                       | 2.5                           | 0                    | 0                         | 0                             |
| 17    | .06                  | 50                        | .01                           | 3.6                  | 183                       | 1.8                           | 0                    | 0                         | 0                             |
| 18    | 0                    | 0                         | 0                             | 2.0                  | 175                       | .95                           | 0                    | 0                         | 0                             |
| 19    | 0                    | 0                         | 0                             | .92                  | 168                       | .42                           | 0                    | 0                         | 0                             |
| 20    | 0                    | 0                         | 0                             | .76                  | 160                       | .33                           | 0                    | 0                         | 0                             |
| 21    | 2.2                  | 2800                      | 17                            | .48                  | 150                       | .19                           | 0                    | 0                         | 0                             |
| 22    | 1.1                  | 1300                      | 3.9                           | .36                  | 140                       | .14                           | 0                    | 0                         | 0                             |
| 23    | 1.2                  | 500                       | 1.6                           | .30                  | 100                       | .08                           | 0                    | 0                         | 0                             |
| 24    | .54                  | 250                       | .36                           | .12                  | 80                        | .03                           | 0                    | 0                         | 0                             |
| 25    | 12                   | 2800                      | 91                            | 0                    | 0                         | 0                             | 0                    | 0                         | 0                             |
| 26    | 1.9                  | 1200                      | 6.2                           | 0                    | 0                         | 0                             | 0                    | 0                         | 0                             |
| 27    | .60                  | 600                       | .97                           | 0                    | 0                         | 0                             | 0                    | 0                         | 0                             |
| 28    | 1170                 | 32000                     | 101000                        | 0                    | 0                         | 0                             | 0                    | 0                         | 0                             |
| 29    | 1150                 | 22500                     | 69900                         | 0                    | 0                         | 0                             | 0                    | 0                         | 0                             |
| 30    | 310                  | 8300                      | 6950                          | 0                    | 0                         | 0                             | 0                    | 0                         | 0                             |
| 31    | 137                  | 7000                      | 2590                          | 0                    | 0                         | 0                             | --                   | --                        | --                            |
| TOTAL | 2818.94              | --                        | 180595.39                     | 784.34               | --                        | 8329.04                       | 0                    | --                        | 0                             |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

59769.74  
2420725.75

## BAD RIVER BASIN

79

06441500 BAD RIVER NEAR FORT PIERRE, S. DAK.--Continued

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE  | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PENDE<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.002 MM<br>(70337) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.004 MM<br>(70338) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.016 MM<br>(70340) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(70342) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM<br>(70343) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM<br>(70344) | SUS.<br>SED.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM<br>(70345) |
|-------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| JULY  |      |                                        |                                                          |                                                     |                                                       |                                                                        |                                                                        |                                                                        |                                                                        |                                                                        |                                                                        |                                                                        |
| 28... | 1800 | 21.5                                   | 2150                                                     | 64500                                               | 374000                                                | 60                                                                     | 72                                                                     | 92                                                                     | 98                                                                     | 99                                                                     | 99                                                                     | 100                                                                    |
| 29... | 1200 | 22.0                                   | 976                                                      | 11900                                               | 31400                                                 | 55                                                                     | 68                                                                     | 90                                                                     | 98                                                                     | 99                                                                     | 100                                                                    | --                                                                     |
| 31... | 1815 | 24.5                                   | 225                                                      | 7000                                                | 4250                                                  | 70                                                                     | 85                                                                     | 98                                                                     | 100                                                                    | --                                                                     | --                                                                     | --                                                                     |

## PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE  | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | NUMBER<br>OF<br>SAM-<br>PLING<br>POINTS<br>(00063) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(80158) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM<br>(80159) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM<br>(80160) |
|-------|------|----------------------------------------|----------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|
| JULY  |      |                                        |                                                    |                                                          |                                                                       |                                                                       |                                                                       |
| 29... | 1200 | 22.0                                   | 1                                                  | 976                                                      | 0                                                                     | 1                                                                     | 4                                                                     |
| 31... | 1815 | 24.5                                   | 1                                                  | 225                                                      | 0                                                                     | 1                                                                     | 4                                                                     |

| DATE  | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM<br>(80161) | BED<br>MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>1.00 MM<br>(80162) | BED<br>MAT.<br>SIEVE<br>DIAM.<br>% FINER<br>THAN<br>2.00 MM<br>(80169) | BED<br>MAT.<br>SIEVE<br>DIAM.<br>% FINER<br>THAN<br>4.00 MM<br>(80170) | BED<br>MAT.<br>SIEVE<br>DIAM.<br>% FINER<br>THAN<br>8.00 MM<br>(80171) | BED<br>MAT.<br>SIEVE<br>DIAM.<br>% FINER<br>THAN<br>16.0 MM<br>(80172) | BED<br>MAT.<br>SIEVE<br>DIAM.<br>% FINER<br>THAN<br>32.0 MM<br>(80173) |
|-------|-----------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
| JULY  |                                                                       |                                                                       |                                                                        |                                                                        |                                                                        |                                                                        |                                                                        |
| 29... | 36                                                                    | 61                                                                    | 68                                                                     | 75                                                                     | 85                                                                     | 96                                                                     | 100                                                                    |
| 31... | 43                                                                    | 70                                                                    | 78                                                                     | 83                                                                     | 88                                                                     | 96                                                                     | 100                                                                    |

## WHITE RIVER BASIN

06452000 WHITE RIVER NEAR OACOMA, S. DAK.

LOCATION.--Lat 43°44'54", long 99°33'22", in SEkSWk sec.3, T.103 N., R.73 W., Lyman County, at gaging station, on left bank at downstream side of bridge on State Highway 47, 1.5 miles downstream from Wagner Draw, 1.8 miles upstream from high-water line of Lake Francis Case, and 8.8 miles southwest of Oacoma.

DRAINAGE AREA.--10,200 sq mi approximately.

PERIOD OF RECORD.--Sediment records: October 1971 to September 1972.

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | OCTOBER              |                           |                               | NOVEMBER             |                           |                               | DECEMBER             |                           |                               |
|-------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|-------------------------------|
|       | 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     | 82                   | 200                       | 44                            | 167                  | 3600                      | 1620                          | 55                   | 200                       | 30                            |
| 2     | 90                   | 1500                      | 365                           | 182                  | 3400                      | 1670                          | 55                   | 200                       | 30                            |
| 3     | 82                   | 950                       | 210                           | 167                  | 3100                      | 1400                          | 50                   | 200                       | 27                            |
| 4     | 92                   | 1500                      | 373                           | 155                  | 2800                      | 1170                          | 50                   | 190                       | 26                            |
| 5     | 82                   | 950                       | 210                           | 329                  | 7000                      | 6220                          | 45                   | 190                       | 23                            |
| 6     | 87                   | 1500                      | 352                           | 534                  | 6300                      | 9080                          | 42                   | 190                       | 22                            |
| 7     | 56                   | 600                       | 91                            | 779                  | 23200                     | 48800                         | 40                   | 180                       | 19                            |
| 8     | 47                   | 350                       | 44                            | 857                  | 13800                     | 31900                         | 40                   | 180                       | 19                            |
| 9     | 153                  | 2800                      | 1160                          | 779                  | 17000                     | 35800                         | 37                   | 180                       | 18                            |
| 10    | 170                  | 3500                      | 1610                          | 220                  | 20800                     | 12400                         | 37                   | 180                       | 18                            |
| 11    | 141                  | 2500                      | 952                           | 279                  | 11600                     | 8740                          | 35                   | 170                       | 16                            |
| 12    | 117                  | 1800                      | 569                           | 255                  | 9800                      | 6750                          | 35                   | 170                       | 16                            |
| 13    | 107                  | 1500                      | 433                           | 224                  | 7600                      | 4600                          | 37                   | 170                       | 17                            |
| 14    | 92                   | 1300                      | 323                           | 224                  | 5000                      | 3020                          | 37                   | 160                       | 16                            |
| 15    | 78                   | 1000                      | 211                           | 217                  | 3800                      | 2230                          | 37                   | 160                       | 16                            |
| 16    | 76                   | 800                       | 164                           | 245                  | 8000                      | 5290                          | 37                   | 160                       | 16                            |
| 17    | 71                   | 600                       | 115                           | 245                  | 6000                      | 3970                          | 37                   | 150                       | 15                            |
| 18    | 144                  | 6500                      | 2530                          | 217                  | 4000                      | 2340                          | 39                   | 150                       | 16                            |
| 19    | 80                   | 4400                      | 950                           | 191                  | 3000                      | 1550                          | 39                   | 150                       | 16                            |
| 20    | 71                   | 3170                      | 608                           | 179                  | 2000                      | 967                           | 39                   | 140                       | 15                            |
| 21    | 99                   | 3500                      | 936                           | 291                  | 12000                     | 9430                          | 40                   | 140                       | 15                            |
| 22    | 234                  | 9800                      | 6190                          | 283                  | 10000                     | 7640                          | 42                   | 140                       | 16                            |
| 23    | 558                  | 16500                     | 24900                         | 338                  | 14000                     | 12800                         | 42                   | 130                       | 15                            |
| 24    | 419                  | 11600                     | 13100                         | 291                  | 12000                     | 9430                          | 42                   | 130                       | 15                            |
| 25    | 287                  | 8500                      | 6590                          | 234                  | 10000                     | 6320                          | 40                   | 130                       | 14                            |
| 26    | 220                  | 7500                      | 4460                          | 217                  | 6000                      | 3520                          | 35                   | 120                       | 11                            |
| 27    | 231                  | 8200                      | 5110                          | 200                  | 4000                      | 2160                          | 32                   | 120                       | 10                            |
| 28    | 185                  | 5600                      | 2800                          | 120                  | 1000                      | 324                           | 32                   | 120                       | 10                            |
| 29    | 182                  | 3800                      | 1870                          | 80                   | 600                       | 130                           | 30                   | 110                       | 8.9                           |
| 30    | 238                  | 5300                      | 3410                          | 60                   | 300                       | 49                            | 30                   | 110                       | 8.9                           |
| 31    | 150                  | 2000                      | 810                           | --                   | --                        | --                            | 30                   | 110                       | 8.9                           |
| TOTAL | 4721                 | --                        | 81490                         | 8559                 | --                        | 241320                        | 1218                 | --                        | 523.7                         |

## PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE  | TIME | TEMPERATURE (DEG C) (00010)                       | INSTANTANEOUS DISCHARGE (CFS) (00061)             | SUSPENDED SEDIMENT (MG/L) (80154)                 | SUSPENDED SEDIMENT DISCHARGE (T/DAY) (80155)      | SUS. SED. FALL DIAM. % FINER THAN .002 MM (70337) | SUS. SED. FALL DIAM. % FINER THAN .004 MM (70338) |
|-------|------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|---------------------------------------------------|
|       |      |                                                   |                                                   |                                                   |                                                   |                                                   |                                                   |
| JULY  |      |                                                   |                                                   |                                                   |                                                   |                                                   |                                                   |
| 27... | 0745 | 22.0                                              | 3100                                              | 61200                                             | 512000                                            | 40                                                | 47                                                |
| 28... | 0900 | 21.0                                              | 5150                                              | 45000                                             | 626000                                            | 42                                                | 47                                                |
| AUG.  |      |                                                   |                                                   |                                                   |                                                   |                                                   |                                                   |
| 04... | 1240 | 20.5                                              | 440                                               | 4920                                              | 5850                                              | 77                                                | 89                                                |
| 08... | 0750 | 19.0                                              | 1130                                              | 31600                                             | 96400                                             | 67                                                | 79                                                |
| 09... | 1430 | 24.5                                              | 675                                               | 23200                                             | 42300                                             | 24                                                | 29                                                |
|       |      |                                                   |                                                   |                                                   |                                                   |                                                   |                                                   |
| DATE  |      | SUS. SED. FALL DIAM. % FINER THAN .016 MM (70340) | SUS. SED. FALL DIAM. % FINER THAN .062 MM (70342) | SUS. SED. FALL DIAM. % FINER THAN .125 MM (70343) | SUS. SED. FALL DIAM. % FINER THAN .250 MM (70344) | SUS. SED. FALL DIAM. % FINER THAN .500 MM (70345) | SUS. SED. FALL DIAM. % FINER THAN 1.00 MM (70346) |
| JULY  |      |                                                   |                                                   |                                                   |                                                   |                                                   |                                                   |
| 27... | 71   | 93                                                | 94                                                | 95                                                | 97                                                | 99                                                |                                                   |
| 28... | 71   | 98                                                | 99                                                | 99                                                | 100                                               | --                                                |                                                   |
| AUG.  |      |                                                   |                                                   |                                                   |                                                   |                                                   |                                                   |
| 04... | 96   | 100                                               | --                                                | --                                                | --                                                | --                                                |                                                   |
| 08... | 95   | 99                                                | 100                                               | --                                                | --                                                | --                                                |                                                   |
| 09... | 34   | 82                                                | 84                                                | 86                                                | 92                                                | 100                                               |                                                   |

## WHITE RIVER BASIN

81

06452000 WHITE RIVER NEAR OACOMA, S. DAK.--Continued

## EXTREMES.--1971-72:

Sediment concentrations: Maximum daily, 69,000 mg/l May 2; minimum daily, 76 mg/l Sept. 12.

Sediment discharge: Maximum daily, 802,000 tons May 14; minimum daily, 3.0 tons Jan. 26.

REMARKS.--Records poor. Flow affected by ice Nov. 27 to Mar. 12. Suspended-sediment concentrations prior to July 1 furnished by District office, Corps of Engineers, Omaha, Nebr. Sediment-discharge records prior to Oct. 1, 1971, are on file in the District office, Corps of Engineers, Omaha, Nebr. Miscellaneous samples for chemical data published for water years 1946-53, 1969.

## SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | JANUARY              |                           |                               | FEBRUARY             |                           |                               | MARCH                |                           |                               |
|-------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|-------------------------------|----------------------|---------------------------|-------------------------------|
|       | 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     | 27                   | 110                       | 8.0                           | 18                   | 90                        | 4.4                           | 1000                 | 5200                      | 14000                         |
| 2     | 24                   | 100                       | 6.5                           | 16                   | 90                        | 3.9                           | 900                  | 4500                      | 10900                         |
| 3     | 23                   | 100                       | 6.2                           | 15                   | 90                        | 3.6                           | 900                  | 4500                      | 10900                         |
| 4     | 22                   | 100                       | 5.9                           | 15                   | 90                        | 3.6                           | 950                  | 5000                      | 12800                         |
| 5     | 22                   | 100                       | 5.9                           | 15                   | 90                        | 3.6                           | 950                  | 5000                      | 12800                         |
| 6     | 23                   | 100                       | 6.2                           | 16                   | 90                        | 3.9                           | 1000                 | 5200                      | 14000                         |
| 7     | 23                   | 100                       | 6.2                           | 16                   | 90                        | 3.9                           | 1000                 | 5200                      | 14000                         |
| 8     | 24                   | 100                       | 6.5                           | 16                   | 90                        | 3.9                           | 1080                 | 5500                      | 16000                         |
| 9     | 25                   | 90                        | 6.1                           | 17                   | 80                        | 3.7                           | 1100                 | 5500                      | 16300                         |
| 10    | 25                   | 90                        | 6.1                           | 17                   | 80                        | 3.7                           | 1300                 | 6500                      | 22800                         |
| 11    | 25                   | 90                        | 6.1                           | 18                   | 80                        | 3.9                           | 1500                 | 7000                      | 28400                         |
| 12    | 23                   | 90                        | 5.6                           | 18                   | 90                        | 4.4                           | 1700                 | 8000                      | 36700                         |
| 13    | 22                   | 90                        | 5.3                           | 18                   | 90                        | 4.4                           | 1980                 | 9000                      | 48100                         |
| 14    | 20                   | 90                        | 4.9                           | 20                   | 100                       | 5.4                           | 1470                 | 7000                      | 27800                         |
| 15    | 20                   | 90                        | 4.9                           | 20                   | 100                       | 5.4                           | 1200                 | 6000                      | 19400                         |
| 16    | 21                   | 90                        | 5.1                           | 20                   | 130                       | 7.0                           | 690                  | 3900                      | 7270                          |
| 17    | 22                   | 80                        | 4.8                           | 25                   | 130                       | 8.8                           | 540                  | 3100                      | 4520                          |
| 18    | 22                   | 80                        | 4.8                           | 50                   | 150                       | 20                            | 472                  | 2600                      | 3310                          |
| 19    | 21                   | 80                        | 4.5                           | 80                   | 200                       | 43                            | 424                  | 2400                      | 2750                          |
| 20    | 21                   | 80                        | 4.5                           | 150                  | 250                       | 101                           | 399                  | 2300                      | 2480                          |
| 21    | 22                   | 80                        | 4.8                           | 250                  | 500                       | 338                           | 356                  | 2200                      | 2110                          |
| 22    | 22                   | 80                        | 4.8                           | 300                  | 900                       | 729                           | 325                  | 2000                      | 1760                          |
| 23    | 20                   | 80                        | 4.3                           | 400                  | 1200                      | 1300                          | 308                  | 1900                      | 1580                          |
| 24    | 18                   | 80                        | 3.9                           | 350                  | 1000                      | 945                           | 321                  | 2000                      | 1730                          |
| 25    | 16                   | 80                        | 3.5                           | 300                  | 500                       | 405                           | 389                  | 2300                      | 2420                          |
| 26    | 14                   | 80                        | 3.0                           | 500                  | 1000                      | 1350                          | 419                  | 2000                      | 2260                          |
| 27    | 15                   | 80                        | 3.2                           | 1000                 | 3000                      | 8100                          | 304                  | 1800                      | 1480                          |
| 28    | 16                   | 80                        | 3.5                           | 1300                 | 4500                      | 15800                         | 287                  | 1600                      | 1240                          |
| 29    | 18                   | 80                        | 3.9                           | 1500                 | 5000                      | 20300                         | 279                  | 1500                      | 1130                          |
| 30    | 20                   | 80                        | 4.3                           | --                   | --                        | --                            | 271                  | 1400                      | 1020                          |
| 31    | 20                   | 80                        | 4.3                           | --                   | --                        | --                            | 255                  | 1300                      | 895                           |
| TOTAL | 656                  | --                        | 157.6                         | 6480                 | --                        | 49508.5                       | 24069                | --                        | 342855                        |

## PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPERATURE<br>(DEG C)<br>(00010) | NUMBER<br>OF<br>SAM-<br>PLING<br>POINTS<br>(00063) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | BED                                                            | BED                                                            | BED                                                            | BED                                                            | BED                                                            | BED                                                            | BED                                                            | BED                                                            |
|---------------|------|-----------------------------------|----------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|----------------------------------------------------------------|
|               |      |                                   |                                                    |                                                          | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.062 MM<br>(80158) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.125 MM<br>(80159) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.250 MM<br>(80160) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>.500 MM<br>(80161) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>1.00 MM<br>(80162) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>2.00 MM<br>(80169) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>4.00 MM<br>(80170) | MAT.<br>FALL<br>DIAM.<br>% FINER<br>THAN<br>8.00 MM<br>(80171) |
| AUG.<br>04... | 1240 | 20.5                              | 1                                                  | 440                                                      | 0                                                              | 4                                                              | 26                                                             | 68                                                             | 97                                                             | 99                                                             | 100                                                            | --                                                             |
| SEP.<br>14... | 1200 | 18.5                              | 1                                                  | 47                                                       | --                                                             | 0                                                              | 14                                                             | 52                                                             | 86                                                             | 96                                                             | 99                                                             | 100                                                            |
| 22...         | 0845 | 11.0                              | --                                                 | 24                                                       | 48                                                             | 58                                                             | 64                                                             | 83                                                             | 97                                                             | 100                                                            | --                                                             | --                                                             |

## WHITE RIVER BASIN

06452000 WHITE RIVER NEAR OACOMA, S. DAK.--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| 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                                                  | 252                  | 1200                      | 816                           | 2670                 | 50000                     | 360000                        | 914                  | 15000                     | 37000                         |
| 2                                                  | 231                  | 1100                      | 686                           | 3710                 | 69000                     | 691000                        | 733                  | 8500                      | 16800                         |
| 3                                                  | 248                  | 1100                      | 737                           | 2680                 | 56000                     | 405000                        | 583                  | 5600                      | 8810                          |
| 4                                                  | 227                  | 1000                      | 613                           | 2460                 | 46500                     | 309000                        | 477                  | 4300                      | 5540                          |
| 5                                                  | 210                  | 950                       | 539                           | 1890                 | 40000                     | 204000                        | 429                  | 3600                      | 4170                          |
| 6                                                  | 210                  | 907                       | 514                           | 1360                 | 23500                     | 86300                         | 366                  | 3200                      | 3160                          |
| 7                                                  | 207                  | 910                       | 509                           | 1160                 | 15800                     | 49500                         | 366                  | 2800                      | 2770                          |
| 8                                                  | 220                  | 900                       | 535                           | 889                  | 12800                     | 30700                         | 338                  | 2200                      | 2010                          |
| 9                                                  | 204                  | 875                       | 482                           | 756                  | 11200                     | 22900                         | 366                  | 5000                      | 4940                          |
| 10                                                 | 191                  | 880                       | 454                           | 675                  | 10500                     | 19100                         | 366                  | 4500                      | 4450                          |
| 11                                                 | 214                  | 850                       | 491                           | 748                  | 10500                     | 21200                         | 321                  | 6500                      | 5630                          |
| 12                                                 | 207                  | 800                       | 447                           | 973                  | 16500                     | 43300                         | 259                  | 3200                      | 2240                          |
| 13                                                 | 204                  | 780                       | 430                           | 2880                 | 42000                     | 327000                        | 234                  | 2500                      | 1580                          |
| 14                                                 | 255                  | 1800                      | 1240                          | 5770                 | 51500                     | 802000                        | 224                  | 2000                      | 1210                          |
| 15                                                 | 255                  | 2000                      | 1380                          | 3500                 | 31500                     | 298000                        | 602                  | 30000                     | 48800                         |
| 16                                                 | 227                  | 1200                      | 735                           | 2170                 | 26500                     | 155000                        | 857                  | 46000                     | 106000                        |
| 17                                                 | 204                  | 900                       | 496                           | 1480                 | 23200                     | 92700                         | 648                  | 33500                     | 58600                         |
| 18                                                 | 198                  | 800                       | 428                           | 1120                 | 20500                     | 62000                         | 456                  | 24300                     | 29900                         |
| 19                                                 | 220                  | 1800                      | 1070                          | 956                  | 18000                     | 46500                         | 500                  | 20500                     | 27700                         |
| 20                                                 | 317                  | 3000                      | 2570                          | 787                  | 15500                     | 32900                         | 1140                 | 47500                     | 146000                        |
| 21                                                 | 304                  | 2000                      | 1640                          | 565                  | 13000                     | 19800                         | 1200                 | 34000                     | 110000                        |
| 22                                                 | 295                  | 1500                      | 1190                          | 500                  | 10500                     | 14200                         | 810                  | 21500                     | 47000                         |
| 23                                                 | 287                  | 1200                      | 930                           | 650                  | 8000                      | 14000                         | 615                  | 16000                     | 26600                         |
| 24                                                 | 267                  | 900                       | 649                           | 472                  | 6000                      | 7650                          | 608                  | 16000                     | 26300                         |
| 25                                                 | 245                  | 850                       | 562                           | 488                  | 7200                      | 9490                          | 472                  | 11500                     | 14700                         |
| 26                                                 | 275                  | 2000                      | 1490                          | 394                  | 5500                      | 5850                          | 494                  | 11000                     | 14700                         |
| 27                                                 | 338                  | 5760                      | 5260                          | 680                  | 25500                     | 46800                         | 361                  | 7500                      | 7310                          |
| 28                                                 | 404                  | 7000                      | 7640                          | 771                  | 20500                     | 42700                         | 312                  | 5000                      | 4210                          |
| 29                                                 | 414                  | 4000                      | 4470                          | 494                  | 8000                      | 10700                         | 452                  | 15000                     | 18300                         |
| 30                                                 | 631                  | 13000                     | 22100                         | 498                  | 6500                      | 8740                          | 500                  | 16500                     | 22300                         |
| 31                                                 | --                   | --                        | --                            | 1360                 | 38500                     | 141000                        | --                   | --                        | --                            |
| TOTAL                                              | 7961                 | --                        | 61103                         | 45506                | --                        | 4379030                       | 16003                | --                        | 808730                        |
|                                                    |                      |                           |                               |                      |                           |                               |                      |                           |                               |
| 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                                                  | 434                  | 12500                     | 14600                         | 1250                 | 12000                     | 40500                         | 80                   | 870                       | 188                           |
| 2                                                  | 450                  | 10000                     | 12200                         | 704                  | 8500                      | 16200                         | 82                   | 810                       | 179                           |
| 3                                                  | 317                  | 7000                      | 5990                          | 450                  | 6300                      | 7650                          | 76                   | 750                       | 154                           |
| 4                                                  | 259                  | 5000                      | 3500                          | 338                  | 4900                      | 4470                          | 69                   | 690                       | 129                           |
| 5                                                  | 238                  | 4100                      | 2630                          | 1890                 | 37000                     | 189000                        | 67                   | 622                       | 113                           |
| 6                                                  | 217                  | 3600                      | 2110                          | 2680                 | 55500                     | 402000                        | 65                   | 560                       | 98                            |
| 7                                                  | 194                  | 3200                      | 1680                          | 1540                 | 38500                     | 160000                        | 56                   | 500                       | 76                            |
| 8                                                  | 173                  | 2700                      | 1260                          | 982                  | 30200                     | 80100                         | 53                   | 440                       | 63                            |
| 9                                                  | 155                  | 2300                      | 963                           | 682                  | 24000                     | 44200                         | 53                   | 387                       | 55                            |
| 10                                                 | 138                  | 1900                      | 708                           | 505                  | 18500                     | 25200                         | 49                   | 280                       | 37                            |
| 11                                                 | 130                  | 1400                      | 491                           | 409                  | 14000                     | 15500                         | 44                   | 180                       | 21                            |
| 12                                                 | 127                  | 1000                      | 343                           | 312                  | 10500                     | 8850                          | 53                   | 76                        | 11                            |
| 13                                                 | 149                  | 3000                      | 1210                          | 270                  | 7500                      | 5470                          | 54                   | 150                       | 22                            |
| 14                                                 | 245                  | 8000                      | 5290                          | 234                  | 5000                      | 3160                          | 45                   | 241                       | 29                            |
| 15                                                 | 147                  | 1400                      | 556                           | 179                  | 3000                      | 1450                          | 40                   | 228                       | 25                            |
| 16                                                 | 122                  | 1000                      | 329                           | 147                  | 2000                      | 794                           | 37                   | 215                       | 21                            |
| 17                                                 | 117                  | 950                       | 300                           | 120                  | 1800                      | 583                           | 35                   | 202                       | 19                            |
| 18                                                 | 94                   | 900                       | 228                           | 107                  | 1740                      | 503                           | 33                   | 189                       | 17                            |
| 19                                                 | 117                  | 2000                      | 632                           | 80                   | 1680                      | 363                           | 32                   | 175                       | 15                            |
| 20                                                 | 234                  | 8000                      | 5050                          | 56                   | 1610                      | 243                           | 26                   | 163                       | 11                            |
| 21                                                 | 224                  | 2500                      | 1510                          | 248                  | 1550                      | 1040                          | 21                   | 150                       | 8.5                           |
| 22                                                 | 167                  | 1500                      | 676                           | 194                  | 1490                      | 780                           | 26                   | 137                       | 9.6                           |
| 23                                                 | 144                  | 1000                      | 389                           | 133                  | 1430                      | 514                           | 29                   | 124                       | 9.7                           |
| 24                                                 | 248                  | 12000                     | 8040                          | 107                  | 1370                      | 396                           | 32                   | 120                       | 10                            |
| 25                                                 | 384                  | 27000                     | 28000                         | 97                   | 1300                      | 340                           | 37                   | 200                       | 20                            |
| 26                                                 | 2280                 | 56000                     | 345000                        | 99                   | 1240                      | 331                           | 40                   | 250                       | 27                            |
| 27                                                 | 3110                 | 55000                     | 462000                        | 109                  | 1180                      | 347                           | 35                   | 230                       | 22                            |
| 28                                                 | 4380                 | 42500                     | 503000                        | 104                  | 1120                      | 314                           | 32                   | 215                       | 19                            |
| 29                                                 | 6600                 | 43000                     | 766000                        | 90                   | 1060                      | 258                           | 38                   | 200                       | 21                            |
| 30                                                 | 3500                 | 28000                     | 265000                        | 76                   | 990                       | 203                           | 35                   | 180                       | 17                            |
| 31                                                 | 1960                 | 17800                     | 94200                         | 73                   | 930                       | 183                           | --                   | --                        | --                            |
| TOTAL                                              | 27054                | --                        | 2533885                       | 14265                | --                        | 1010942                       | 1374                 | --                        | 1446.8                        |
| TOTAL DISCHARGE FOR YEAR (CFS-DAYS)                |                      |                           |                               |                      |                           |                               |                      |                           | 157866                        |
| TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS) |                      |                           |                               |                      |                           |                               |                      |                           | 9510991.6                     |



## MISSOURI RIVER MAIN STEM

83

06467500 MISSOURI RIVER AT YANKTON, S. DAK.

LOCATION.--Lat 42°51'58", long 97°23'37", 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, 5.2 miles (corrected) 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 1972.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>SOLVED<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>AMMONIA<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00608) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00618) |
|---------------|------|----------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------|
| OCT.<br>27... | 1300 | 52100                                        | 60                                                          | 21                                                                 | --                                                      | 9.9                                                          | .14                                                                    | .14                                                   |
| NOV.<br>16... | 1240 | 52700                                        | 59                                                          | 21                                                                 | 220                                                     | 11                                                           | .09                                                                    | .14                                                   |
| DEC.<br>16... | 0930 | 20500                                        | 61                                                          | 21                                                                 | 220                                                     | 13                                                           | .04                                                                    | .23                                                   |
| JAN.<br>12... | 1130 | 19900                                        | 63                                                          | 23                                                                 | 220                                                     | 13                                                           | .10                                                                    | .22                                                   |
| FEB.<br>09... | 1300 | 20600                                        | 60                                                          | 23                                                                 | 220                                                     | 11                                                           | .01                                                                    | .16                                                   |
| MAR.<br>31... | 1313 | 38000                                        | 59                                                          | 21                                                                 | 220                                                     | 10                                                           | .07                                                                    | .16                                                   |
| APR.<br>25... | 1605 | 41000                                        | 60                                                          | 22                                                                 | 210                                                     | 9.1                                                          | .03                                                                    | .09                                                   |
| MAY<br>30...  | 1330 | 37100                                        | 59                                                          | 21                                                                 | 200                                                     | 13                                                           | .02                                                                    | .09                                                   |
| JUNE<br>29... | 0915 | 41400                                        | 61                                                          | 21                                                                 | 230                                                     | 10                                                           | .04                                                                    | .12                                                   |
| AUG.<br>23... | 1315 | 48600                                        | 60                                                          | 22                                                                 | 220                                                     | 11                                                           | .03                                                                    | .11                                                   |
| SEP.<br>28... | 1130 | 49500                                        | 59                                                          | 21                                                                 | 210                                                     | 9.9                                                          | .03                                                                    | .18                                                   |

| DATE          | DIS-<br>SOLVED<br>NITRITE<br>(N)<br>(MG/L)<br>(00613) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>SOLIDS<br>(RESI-<br>DUE AT<br>180 C)<br>(MG/L)<br>(70300) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>27... | .000                                                  | .14                                                   | .070                                                 | 750                                                                         | 744                                                                   | 7.9                      | 13.5                                   |
| NOV.<br>16... | .000                                                  | .14                                                   | .070                                                 | 502                                                                         | 751                                                                   | 8.2                      | 9.0                                    |
| DEC.<br>16... | .000                                                  | .23                                                   | .050                                                 | 502                                                                         | 755                                                                   | 8.1                      | 1.0                                    |
| JAN.<br>12... | .000                                                  | .22                                                   | .010                                                 | 510                                                                         | 771                                                                   | 8.1                      | .0                                     |
| FEB.<br>09... | .000                                                  | .16                                                   | .020                                                 | 500                                                                         | 768                                                                   | 8.2                      | --                                     |
| MAR.<br>31... | .000                                                  | .16                                                   | .050                                                 | 512                                                                         | 742                                                                   | 8.2                      | --                                     |
| APR.<br>25... | .000                                                  | .09                                                   | .040                                                 | 514                                                                         | 727                                                                   | 8.2                      | 7.8                                    |
| MAY<br>30...  | .000                                                  | .09                                                   | .050                                                 | 476                                                                         | 722                                                                   | 7.3                      | --                                     |
| JUNE<br>29... | .000                                                  | .12                                                   | .060                                                 | 540                                                                         | 758                                                                   | 8.3                      | 21.0                                   |
| AUG.<br>23... | .010                                                  | .12                                                   | .030                                                 | 514                                                                         | 755                                                                   | 8.2                      | 24.0                                   |
| SEP.<br>28... | .000                                                  | .18                                                   | .050                                                 | 458                                                                         | 726                                                                   | 8.0                      | 16.4                                   |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

## JAMES RIVER BASIN

06471000 JAMES RIVER AT COLUMBIA, S. DAK.

LOCATION(corrected).--Lat 45°37'05", long 98°19'30", 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 Transportation Co. bridge, 3.6 miles upstream from Elm River, and 9.4 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 1972 (daily).  
Water temperatures: October 1966 to September 1972.

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 941 mg/l Jan. 1-26; minimum, 282 mg/l Apr. 1-30.

Hardness: Maximum, 480 mg/l Jan. 1-26; minimum, 160 mg/l Apr. 1-30.

Specific conductance: Maximum daily, 1,860 micromhos Jan. 20; minimum daily, 240 micromhos Mar. 17.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SiO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PU-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 28                                         | 19                                                      | 67                                                          | 46                                                                 | 110                                                   | 16                                                                | 405                                             | 210                                                     | 41                                                           | .4                                                          | 1.4                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 89                                         | 20                                                      | 79                                                          | 49                                                                 | 110                                                   | 15                                                                | 392                                             | 260                                                     | 45                                                           | .4                                                          | 1.3                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 88                                         | 21                                                      | 82                                                          | 49                                                                 | 120                                                   | 15                                                                | 412                                             | 280                                                     | 48                                                           | .3                                                          | 1.4                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-26               | --   | 18                                         | 24                                                      | 94                                                          | 60                                                                 | 140                                                   | 16                                                                | 496                                             | 300                                                     | 56                                                           | .3                                                          | 1.3                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 14-31               | --   | 110                                        | 18                                                      | 63                                                          | 46                                                                 | 92                                                    | 15                                                                | 334                                             | 220                                                     | 43                                                           | .3                                                          | 2.3                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 600                                        | 2.9                                                     | 35                                                          | 17                                                                 | 34                                                    | 8.9                                                               | 173                                             | 78                                                      | 17                                                           | .2                                                          | .72                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 309                                        | 4.7                                                     | 43                                                          | 21                                                                 | 46                                                    | 10                                                                | 227                                             | 95                                                      | 21                                                           | .3                                                          | .40                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 68                                         | 11                                                      | 54                                                          | 29                                                                 | 53                                                    | 12                                                                | 287                                             | 120                                                     | 24                                                           | .3                                                          | .77                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 34                                         | 17                                                      | 55                                                          | 36                                                                 | 73                                                    | 14                                                                | 314                                             | 160                                                     | 32                                                           | .4                                                          | .74                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 43                                         | 21                                                      | 59                                                          | 37                                                                 | 83                                                    | 15                                                                | 351                                             | 150                                                     | 36                                                           | .4                                                          | .72                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 32                                         | 34                                                      | 69                                                          | 44                                                                 | 100                                                   | 16                                                                | 444                                             | 210                                                     | 46                                                           | .5                                                          | 1.3                                                                      |
| WTD. AVG.           | --   | --                                         | 8.9                                                     | 48                                                          | 27                                                                 | 58                                                    | 11                                                                | 252                                             | 128                                                     | 26                                                           | .3                                                          | .84                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | A131                                       | 17                                                      | 63                                                          | 39                                                                 | 87                                                    | 14                                                                | 347                                             | 187                                                     | 37                                                           | .3                                                          | 1.1                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 1010                                                    | 5440                                                        | 3020                                                               | 6500                                                  | 1250                                                              | 28400                                           | 14400                                                   | 2920                                                         | 31                                                          | 95                                                                       |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

A Mean discharge for 319 days of analysis; mean discharge for 365 days, 114 cfs.

## JAMES RIVER BASIN

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

## EXTREMES.--1971-72:--Continued

Water temperatures: Maximum, 30.0°C Aug. 13; minimum, freezing point on many days during December and January.

## Period of record:

Dissolved solids (1966-69, 1970-72): Maximum, 1,190 mg/l Dec. 19-21, 1967; minimum, 282 mg/l Apr. 1-30, 1972.

Hardness (1966-69, 1970-72): Maximum, 503 mg/l Dec. 19-21, 1967; minimum, 160 mg/l Apr. 1-30, 1972.

Specific conductance (1966-72): Maximum daily, 1,860 micromhos Jan. 20, 1972; minimum daily, 240 micromhos Mar. 17, 1972.

Water temperatures (1966-72): 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 Jan. 27 to Mar. 13; reverse flow Mar. 18-22. 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 1971 TO SEPTEMBER 1972

| DATE                        | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|-----------------------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.<br>01-31               | --                                                                  | .33                                                  | 330                                                 | 716                                                                       | .97                                                           | 54.1                                                        | 360                                           | 24                                                           | 2.5                                                | 1120                                                                  | 8.0                      | --                                     |
| NOV.<br>01-30               | --                                                                  | .20                                                  | 290                                                 | 778                                                                       | 1.06                                                          | 187                                                         | 400                                           | 77                                                           | 2.4                                                | 1200                                                                  | 8.0                      | --                                     |
| DEC.<br>01-31               | .22                                                                 | .35                                                  | 230                                                 | 825                                                                       | 1.12                                                          | 196                                                         | 410                                           | 69                                                           | 2.6                                                | 1230                                                                  | 8.1                      | --                                     |
| JAN.<br>01-26               | .46                                                                 | .47                                                  | 300                                                 | 941                                                                       | 1.28                                                          | 45.7                                                        | 480                                           | 75                                                           | 2.8                                                | 1400                                                                  | 8.2                      | --                                     |
| MAR.<br>14-31               | .32                                                                 | .33                                                  | 190                                                 | 673                                                                       | .92                                                           | 200                                                         | 350                                           | 73                                                           | 2.2                                                | 1030                                                                  | 7.9                      | --                                     |
| APR.<br>01-30               | .11                                                                 | .11                                                  | 110                                                 | 282                                                                       | .38                                                           | 457                                                         | 160                                           | 15                                                           | 1.2                                                | 475                                                                   | 8.2                      | --                                     |
| MAY<br>01-31                | .22                                                                 | .23                                                  | 150                                                 | 355                                                                       | .48                                                           | 296                                                         | 190                                           | 8                                                            | 1.4                                                | 597                                                                   | 7.9                      | --                                     |
| JUNE<br>01-30               | .35                                                                 | .37                                                  | 220                                                 | 449                                                                       | .61                                                           | 82.4                                                        | 250                                           | 19                                                           | 1.4                                                | 729                                                                   | 8.1                      | --                                     |
| JULY<br>01-31               | .38                                                                 | .38                                                  | 280                                                 | 546                                                                       | .74                                                           | 50.1                                                        | 290                                           | 28                                                           | 1.9                                                | 838                                                                   | 8.0                      | --                                     |
| AUG.<br>01-31               | .53                                                                 | .56                                                  | 320                                                 | 579                                                                       | .79                                                           | 67.2                                                        | 300                                           | 12                                                           | 2.1                                                | 924                                                                   | 7.9                      | --                                     |
| SEP.<br>01-30               | .48                                                                 | .49                                                  | 420                                                 | 746                                                                       | 1.01                                                          | 64.5                                                        | 350                                           | 0                                                            | 2.3                                                | 1110                                                                  | 8.1                      | --                                     |
| WTD. AVG.<br>TIME WTD.      | B.20                                                                | .22                                                  | 173                                                 | 436                                                                       | .59                                                           | --                                                          | 232                                           | 25                                                           | 1.6                                                | 700                                                                   | 8.1                      | --                                     |
| AVG.<br>TOT. LOAD<br>(TONS) | B.34                                                                | .34                                                  | 260                                                 | 620                                                                       | .84                                                           | --                                                          | 319                                           | 34                                                           | 2.1                                                | 960                                                                   | 8.0                      | --                                     |
|                             | B21                                                                 | 25                                                   | 19                                                  | 49100                                                                     | --                                                            | --                                                          | --                                            | --                                                           | --                                                 | --                                                                    | --                       | --                                     |

B Based on 258 days of chemical analysis.

## JAMES RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN  | FEB  | MAR | APR | MAY | JUN | JUL | AUG  | SEP  |
|-----|------|------|------|------|------|-----|-----|-----|-----|-----|------|------|
| 1   | 1070 | 1150 | 1180 | 1380 | ---  | --- | 480 | 475 | 645 | 780 | 890  | 1060 |
| 2   | 1080 | 1100 | 1210 | 1200 | ---  | --- | 525 | 475 | 670 | 800 | 880  | 1080 |
| 3   | 1060 | 1100 | 1220 | 1380 | ---  | --- | 530 | 490 | 675 | 800 | 880  | 1060 |
| 4   | 1060 | 1120 | 1210 | 1380 | ---  | --- | 505 | 500 | 675 | 810 | 890  | 1080 |
| 5   | 1100 | 1200 | 1210 | 1270 | ---  | --- | 490 | 510 | 670 | 800 | 880  | 1090 |
| 6   | 1100 | 1200 | 905  | 1500 | ---  | --- | 480 | 520 | 700 | 810 | 820  | 1080 |
| 7   | 1100 | 1360 | 1080 | 1500 | ---  | --- | 465 | 530 | 695 | 810 | 860  | 1100 |
| 8   | 1100 | 1350 | 1160 | 1470 | ---  | --- | 460 | 545 | 720 | 850 | 870  | 1120 |
| 9   | 1020 | 1190 | 1210 | 1480 | ---  | --- | 435 | 550 | 765 | 810 | 880  | 1110 |
| 10  | 933  | 1200 | 1170 | 1460 | ---  | --- | 420 | 560 | 765 | 810 | 900  | 1120 |
| 11  | 950  | 1120 | 1160 | 1440 | ---  | --- | 430 | 560 | 855 | 850 | 920  | 1140 |
| 12  | 1130 | 1190 | 1210 | 1440 | ---  | --- | 410 | 575 | 840 | 860 | 920  | 1140 |
| 13  | 1120 | 1190 | 1200 | 1470 | ---  | --- | 425 | 560 | 855 | 880 | 960  | 1140 |
| 14  | 1140 | 1120 | 1230 | 1500 | ---  | 960 | 420 | 555 | 740 | 870 | 910  | 1110 |
| 15  | 1140 | 1190 | 1240 | 1390 | ---  | 320 | 420 | 590 | 710 | 960 | 960  | 1100 |
| 16  | 1120 | 1150 | 1250 | 1370 | ---  | 260 | 415 | 570 | 770 | 920 | 960  | 1160 |
| 17  | 1110 | 1200 | 1240 | 1570 | ---  | 240 | 415 | 585 | 800 | 920 | 970  | 1160 |
| 18  | 1120 | 1160 | 1210 | 1540 | ---  | 300 | 450 | 600 | 815 | 850 | 970  | 1180 |
| 19  | 1160 | 1150 | 1230 | 1800 | ---  | 505 | 445 | 610 | 815 | 920 | 940  | 1200 |
| 20  | 1150 | 1150 | 1080 | 1860 | ---  | 330 | 445 | 615 | 780 | 900 | 990  | 1220 |
| 21  | 1130 | 1150 | 1090 | 1500 | ---  | 380 | 455 | 645 | 725 | 900 | 1000 | 1210 |
| 22  | 1130 | 1200 | 1240 | 1610 | ---  | 340 | 460 | 645 | 805 | 850 | 1010 | 1260 |
| 23  | 1150 | 1160 | 1240 | 1500 | ---  | 310 | 465 | 645 | 750 | 960 | 870  | 1240 |
| 24  | 1150 | 1150 | 1230 | 1840 | ---  | 320 | 465 | 645 | 740 | 910 | 900  | 1260 |
| 25  | 1140 | 1220 | 1240 | 1780 | ---  | 320 | 465 | 640 | 740 | 850 | 1010 | 1250 |
| 26  | 1160 | 1230 | 1260 | 1480 | ---  | 330 | 470 | 640 | 735 | 890 | 1020 | 1270 |
| 27  | 1160 | 1210 | 1260 | ---  | ---  | 340 | 470 | 640 | 715 | 800 | 1020 | 1180 |
| 28  | 1150 | 1210 | 1340 | ---  | ---  | 350 | 480 | 620 | 750 | 820 | 1030 | 1160 |
| 29  | 1150 | 1210 | 1340 | ---  | ---  | 370 | 480 | 615 | 750 | 860 | 1030 | 1180 |
| 30  | 1130 | 1230 | 1220 | ---  | ---  | 350 | 480 | 610 | 730 | 800 | 1030 | 1200 |
| 31  | 1160 | ---  | 1320 | ---  | ---  | 360 | --- | 660 | --- | 790 | 1030 | ---  |
| AVG | 1110 | 1190 | 1210 | 1540 | 2140 | --- | 459 | 580 | 747 | 853 | 942  | 1160 |

C Based on 26 days of data.

## JAMES RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV | DEC | JAN | FEB | MAR | APR  | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 1   | 15.0 | 7.0 | 1.0 | 0.0 | --- | --- | 0.5  | 12.0 | 20.0 | 19.0 | 22.0 | 19.0 |
| 2   | 17.0 | 3.0 | 1.0 | 0.0 | --- | --- | 3.0  | 10.0 | 22.0 | 20.0 | 21.0 | 18.0 |
| 3   | 15.0 | 3.0 | 1.0 | 0.5 | --- | --- | 3.0  | 12.0 | 24.0 | 17.0 | 20.0 | 20.0 |
| 4   | 15.0 | 4.0 | 0.5 | 0.0 | --- | --- | 2.0  | 10.0 | 22.0 | 17.0 | 18.0 | 18.0 |
| 5   | 15.0 | 2.0 | 0.0 | 0.0 | --- | --- | 4.0  | 12.0 | 23.0 | 19.0 | 19.0 | 21.0 |
| 6   | 15.0 | 1.0 | 0.0 | 0.0 | --- | --- | 6.0  | 9.0  | 25.0 | 18.0 | 18.0 | 19.0 |
| 7   | 13.0 | 1.0 | 0.0 | 0.0 | --- | --- | 5.0  | 10.0 | 24.0 | 20.0 | 21.0 | 20.0 |
| 8   | 12.0 | 3.0 | 0.0 | 0.0 | --- | --- | 3.0  | 11.0 | 23.0 | 19.0 | 16.0 | 18.0 |
| 9   | 14.0 | 4.0 | 0.0 | 0.0 | --- | --- | 5.0  | 10.0 | 24.0 | 20.0 | 19.0 | 19.0 |
| 10  | 12.0 | 3.0 | 0.0 | 1.0 | --- | --- | 7.0  | 13.5 | 17.0 | 23.0 | 18.5 | 18.0 |
| 11  | 12.0 | 3.0 | 0.0 | 0.5 | --- | --- | 7.0  | 12.0 | 18.0 | 24.0 | 24.0 | 21.0 |
| 12  | 12.0 | 5.0 | 0.0 | 0.0 | --- | --- | 6.0  | 12.0 | 23.0 | 21.0 | 24.0 | 19.0 |
| 13  | 11.0 | 3.0 | 0.0 | 0.0 | --- | --- | 6.0  | 11.0 | 24.0 | 24.0 | 30.0 | 18.0 |
| 14  | 11.0 | 4.0 | 0.0 | 0.0 | --- | 2.0 | 6.0  | 11.0 | 21.0 | 23.0 | 26.0 | 21.0 |
| 15  | 12.0 | 5.0 | 0.0 | 0.0 | --- | 2.5 | 7.0  | 16.0 | 18.0 | 22.0 | 25.0 | 19.0 |
| 16  | 9.0  | 4.0 | 0.0 | 0.0 | --- | 2.5 | 10.0 | 14.0 | 19.0 | 20.0 | 24.0 | 21.0 |
| 17  | 11.0 | 4.0 | 0.0 | 1.0 | --- | 1.0 | 11.0 | 20.0 | 20.0 | 21.0 | 27.0 | 15.0 |
| 18  | 13.0 | 4.0 | 0.0 | 0.5 | --- | 3.0 | 11.0 | 21.0 | 21.0 | 20.0 | 26.0 | 22.0 |
| 19  | 12.0 | 4.0 | 0.0 | 0.0 | --- | 2.0 | 10.0 | 21.0 | 18.0 | 22.0 | 25.0 | 20.0 |
| 20  | 11.0 | 2.5 | 0.0 | 0.0 | --- | 2.5 | 11.0 | 22.0 | 15.0 | 18.0 | 28.0 | 19.0 |
| 21  | 11.0 | 1.0 | 0.0 | 0.5 | --- | 2.0 | 10.0 | 22.0 | 18.0 | 19.0 | 23.0 | 11.0 |
| 22  | 11.0 | 1.0 | 0.0 | 0.0 | --- | 2.0 | 9.0  | 23.0 | 17.0 | 24.0 | 21.0 | 17.0 |
| 23  | 11.0 | 1.0 | 0.0 | 0.0 | --- | 2.0 | 10.0 | 19.0 | 18.0 | 20.0 | 20.0 | 18.0 |
| 24  | 10.0 | 1.0 | 0.0 | 0.0 | --- | 2.5 | 9.0  | 20.0 | 17.0 | 22.0 | 21.0 | 17.0 |
| 25  | 11.0 | 1.0 | 0.0 | 0.0 | --- | 3.0 | 10.0 | 18.0 | 23.0 | 21.0 | 23.0 | 16.0 |
| 26  | 10.0 | 1.0 | 0.0 | 0.0 | --- | 3.0 | 11.0 | 22.0 | 21.0 | 20.0 | 24.0 | 14.0 |
| 27  | 10.0 | 1.0 | 0.0 | --- | --- | 2.0 | 10.0 | 21.0 | 17.0 | 20.0 | 20.0 | 9.0  |
| 28  | 9.0  | 1.0 | 0.0 | --- | --- | 1.0 | 9.0  | 19.0 | 20.0 | 21.0 | 25.0 | 13.0 |
| 29  | 8.0  | 1.0 | 0.0 | --- | --- | 1.0 | 10.0 | 17.0 | 23.0 | 23.0 | 23.0 | 10.0 |
| 30  | 2.0  | 1.0 | 0.0 | --- | --- | 1.0 | 11.0 | 16.0 | 22.0 | 24.0 | 26.0 | 9.0  |
| 31  | 5.0  | --- | 0.0 | --- | --- | 1.0 | ---  | 18.0 | ---  | 23.0 | 20.0 | ---  |
| AVG | 11.5 | 2.5 | 0.0 | 0.0 | 0.5 | --- | 7.5  | 15.5 | 20.5 | 21.0 | 22.5 | 17.5 |

C Based on 26 days of data.

## 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 1972.  
Water temperatures: August 1956 to September 1972.

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 1,240 mg/l Feb. 1-29; minimum, 359 mg/l Apr. 1-30.

Hardness: Maximum, 620 mg/l Feb. 1-29; minimum, 170 mg/l Apr. 1-30.

Specific conductance: Maximum daily, 1,830 micromhos Feb. 27; minimum daily, 370 micromhos Mar. 24.

Water temperatures: Maximum, 27.0°C Aug. 17, 19-21; minimum, freezing point on many days during November to January.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 37                                         | 9.1                                                     | 71                                                          | 42                                                                 | 110                                                   | 16                                                                | 394                                             | 220                                                     | 49                                                           | .4                                                          | .52                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 50                                         | 10                                                      | 72                                                          | 39                                                                 | 110                                                   | 14                                                                | 399                                             | 220                                                     | 50                                                           | .3                                                          | .53                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 79                                         | 20                                                      | 80                                                          | 45                                                                 | 130                                                   | 15                                                                | 437                                             | 240                                                     | 55                                                           | .4                                                          | .50                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 53                                         | 21                                                      | 83                                                          | 61                                                                 | 150                                                   | 18                                                                | 374                                             | 350                                                     | 67                                                           | .4                                                          | .86                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 20                                         | 28                                                      | 130                                                         | 73                                                                 | 180                                                   | 20                                                                | 558                                             | 450                                                     | 78                                                           | .6                                                          | 1.3                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 912                                        | 17                                                      | 65                                                          | 38                                                                 | 90                                                    | 16                                                                | 269                                             | 250                                                     | 44                                                           | .4                                                          | 1.7                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 1030                                       | 10                                                      | 37                                                          | 18                                                                 | 46                                                    | 12                                                                | 148                                             | 130                                                     | 26                                                           | .3                                                          | 1.3                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1520                                       | 14                                                      | 54                                                          | 25                                                                 | 61                                                    | 14                                                                | 190                                             | 190                                                     | 30                                                           | .3                                                          | .71                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 887                                        | 19                                                      | 67                                                          | 33                                                                 | 74                                                    | 17                                                                | 264                                             | 220                                                     | 37                                                           | .3                                                          | .75                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 164                                        | 17                                                      | 79                                                          | 42                                                                 | 110                                                   | 17                                                                | 342                                             | 270                                                     | 53                                                           | .2                                                          | .71                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 159                                        | 20                                                      | 74                                                          | 39                                                                 | 96                                                    | 17                                                                | 324                                             | 230                                                     | 51                                                           | .3                                                          | .52                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 56                                         | 28                                                      | 71                                                          | 36                                                                 | 73                                                    | 19                                                                | 302                                             | 220                                                     | 30                                                           | .8                                                          | .55                                                                      |
| WTD. AVG.           | --   | --                                         | 15                                                      | 58                                                          | 30                                                                 | 72                                                    | 15                                                                | 231                                             | 203                                                     | 36                                                           | .3                                                          | 1.0                                                                      |
| TIME WTD.           |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | 415                                        | 18                                                      | 73                                                          | 41                                                                 | 102                                                   | 16                                                                | 333                                             | 249                                                     | 47                                                           | .4                                                          | .83                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 6240                                                    | 23700                                                       | 12200                                                              | 29500                                                 | 6090                                                              | 94700                                           | 83100                                                   | 14700                                                        | 133                                                         | 415                                                                      |

## ANALYSIS OF ADDITIONAL SAMPLES

|       |      |       |    |    |    |    |    |     |     |    |    |     |
|-------|------|-------|----|----|----|----|----|-----|-----|----|----|-----|
| MAY   |      |       |    |    |    |    |    |     |     |    |    |     |
| 31... | 1635 | A2310 | 18 | 60 | 28 | 75 | 15 | 236 | 190 | 35 | .3 | .10 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for sample Jan. 1-31, 19 mg/l; all other samples, 0.0 mg/l.  
A Discharge at time of sampling.

## JAMES RIVER BASIN

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

## EXTREMES:--Continued

## Period of record:

Dissolved solids (1956-58, 1959-68, 1970-72): Maximum, 2,180 mg/l Mar. 1-20, 1965; minimum, 147 mg/l Apr. 5-7, 1960.

Hardness (1956-58, 1959-68, 1970-72): Maximum, 963 mg/l Mar. 1-20, 1965; minimum, 63 mg/l Apr. 1-4, 1960.

Specific conductance (1956-70, 1971-72): Maximum daily, 3,170 micromhos Mar. 14, 1965; minimum daily, 176 micromhos Mar. 30, Apr. 2, 1960.

Water temperatures (1956-70, 1971-72): 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. 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. Additional samples 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 1971 TO SEPTEMBER 1972

| DATE                  | DIS-SOLVED-PHOSPHORUS (MG/L) (00666) | TOTAL-PHOSPHORUS (MG/L) (00665) | DIS-SOLVED-BORON (UG/L) (01020) | DIS-SOLVED-SOLIDS (MG/L) (70301) | DIS-SOLVED-SOLIDS (TONS PER DAY) (70303) | DIS-SOLVED-SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM AD-SORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|-----------------------|--------------------------------------|---------------------------------|---------------------------------|----------------------------------|------------------------------------------|------------------------------------------|---------------------------|---------------------------------------|----------------------------------|-------------------------------------------|--------------------|-----------------------------|
| OCT. 01-31            | --                                   | .17                             | 370                             | 714                              | .97                                      | 71.3                                     | 350                       | 27                                    | 2.6                              | 1120                                      | 8.2                | --                          |
| NOV. 01-30            | --                                   | .19                             | 340                             | 715                              | .97                                      | 96.5                                     | 340                       | 13                                    | 2.6                              | 1130                                      | 8.0                | --                          |
| DEC. 01-31            | .29                                  | .33                             | 330                             | 804                              | 1.09                                     | 171                                      | 380                       | 27                                    | 2.9                              | 1200                                      | 8.0                | --                          |
| JAN. 01-31            | .21                                  | .27                             | 360                             | 958                              | 1.30                                     | 137                                      | 460                       | 120                                   | 3.1                              | 1410                                      | 8.5                | --                          |
| FEB. 01-29            | .42                                  | .46                             | 440                             | 1240                             | 1.69                                     | 67.0                                     | 620                       | 170                                   | 3.1                              | 1750                                      | 8.3                | --                          |
| MAR. 01-31            | .42                                  | .45                             | 260                             | 662                              | .90                                      | 1630                                     | 320                       | 98                                    | 2.2                              | 1020                                      | 8.1                | --                          |
| APR. 01-30            | .42                                  | .36                             | 160                             | 359                              | .49                                      | 998                                      | 170                       | 45                                    | 1.6                              | 633                                       | 7.9                | --                          |
| MAY 01-31             | .29                                  | .32                             | 190                             | 486                              | .66                                      | 2000                                     | 240                       | 82                                    | 1.7                              | 670                                       | 7.9                | --                          |
| JUNE 01-30            | .34                                  | .36                             | 240                             | 602                              | .82                                      | 1440                                     | 300                       | 87                                    | 1.9                              | 946                                       | 8.0                | --                          |
| JULY 01-31            | .18                                  | .20                             | 340                             | 760                              | 1.03                                     | 337                                      | 370                       | 90                                    | 2.5                              | 1110                                      | 8.1                | --                          |
| AUG. 01-31            | .20                                  | .21                             | 350                             | 690                              | .94                                      | 296                                      | 350                       | 80                                    | 2.2                              | 1080                                      | 8.0                | --                          |
| SEP. 01-30            | .33                                  | .33                             | 280                             | 630                              | .86                                      | 95.3                                     | 330                       | 78                                    | 1.8                              | 923                                       | 8.3                | --                          |
| WTD. AVG. TIME WTD.   | .34                                  | .35                             | 225                             | 548                              | .75                                      | --                                       | 268                       | 77                                    | 1.9                              | 835                                       | 8.0                | --                          |
| AVG. TOT. LOAD (TONS) | .30                                  | .30                             | 305                             | 717                              | .98                                      | --                                       | 352                       | 76                                    | 2.4                              | 1080                                      | 8.1                | --                          |
|                       | 139                                  | 143                             | 92                              | 225000                           | --                                       | --                                       | --                        | --                                    | --                               | --                                        | --                 | --                          |

## ANALYSIS OF ADDITIONAL SAMPLES

|           |     |     |     |     |     |      |     |    |     |     |     |    |
|-----------|-----|-----|-----|-----|-----|------|-----|----|-----|-----|-----|----|
| MAY 31... | .48 | .69 | 270 | 539 | .73 | 3360 | 260 | 71 | 2.0 | 859 | 7.4 | -- |
|-----------|-----|-----|-----|-----|-----|------|-----|----|-----|-----|-----|----|



## JAMES RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC  | JAN  | FEB  | MAR  | APR | MAY | JUN  | JUL  | AUG  | SEP |
|-----|------|------|------|------|------|------|-----|-----|------|------|------|-----|
| 1   | 1140 | 1120 | 1210 | 1390 | 1670 | 1750 | 530 | 635 | 750  | 1160 | 1250 | 945 |
| 2   | 1130 | 1110 | 1130 | 1440 | 1680 | 1720 | 590 | 700 | 750  | 1140 | 1210 | 945 |
| 3   | 1120 | 1120 | 1180 | 1480 | 1670 | 1750 | 555 | 855 | 775  | 1140 | 1190 | 935 |
| 4   | 1110 | 1120 | 1180 | 1500 | 1690 | 1760 | 560 | 735 | 790  | 1150 | 1190 | 935 |
| 5   | 1140 | 1030 | 1180 | 1520 | 1680 | 1770 | 545 | 725 | 790  | 1150 | 1190 | 915 |
| 6   | 1140 | 1120 | 1180 | 1520 | 1710 | 1780 | 530 | 710 | 780  | 1160 | 1190 | 915 |
| 7   | 1140 | 1150 | 1150 | 1520 | 1740 | 1720 | 545 | 700 | 795  | 1170 | 1180 | 915 |
| 8   | 1130 | 1180 | 1180 | 1520 | 1720 | 1750 | 855 | 700 | 805  | 1170 | 1180 | 925 |
| 9   | 1130 | 1220 | 1190 | 1500 | 1750 | 1740 | 520 | 685 | 810  | 1170 | 1170 | 925 |
| 10  | 1120 | 1180 | 1180 | 1500 | 1760 | 1650 | 510 | 695 | 810  | 1180 | 1160 | 925 |
| 11  | 1150 | 1230 | 1190 | 1480 | 1770 | 1300 | 495 | 715 | 830  | 1200 | 1160 | 935 |
| 12  | 1130 | 1260 | 1200 | 1780 | 1760 | 1410 | 520 | 690 | 850  | 1130 | 1140 | 935 |
| 13  | 1140 | 1240 | 1200 | 1500 | 1770 | 660  | 515 | 700 | 865  | 1180 | 1110 | 940 |
| 14  | 1150 | 1220 | 1200 | 1500 | 1780 | 490  | 565 | 765 | 885  | 1170 | 1100 | 925 |
| 15  | 1130 | 1210 | 1210 | 1520 | 1770 | 590  | 590 | 790 | 905  | 1180 | 1110 | 925 |
| 16  | 1140 | 1190 | 1220 | 1540 | 1770 | 570  | 550 | 775 | 905  | 1190 | 1130 | 935 |
| 17  | 1090 | 1210 | 1210 | 1650 | 1780 | 770  | 550 | 725 | 905  | 1200 | 1150 | 940 |
| 18  | 1130 | 1210 | 1180 | 1520 | 1770 | 860  | 535 | 705 | 900  | 1210 | 1180 | 940 |
| 19  | 1130 | 1210 | 1240 | 1540 | 1800 | 770  | 545 | 720 | 905  | 1210 | 1220 | 940 |
| 20  | 1130 | 1200 | 1240 | 1550 | 1790 | 590  | 550 | 760 | 910  | 1190 | 1250 | 940 |
| 21  | 1150 | 1210 | 1240 | 1580 | 1790 | 475  | 570 | 770 | 915  | 1170 | 1250 | 955 |
| 22  | 1120 | 1140 | 1260 | 1580 | 1790 | 900  | 605 | 765 | 915  | 1190 | 1170 | 960 |
| 23  | 1150 | 1160 | 1280 | 1580 | 1800 | 400  | 690 | 765 | 905  | 1200 | 1050 | 965 |
| 24  | 1150 | 1150 | 1280 | 1590 | 1800 | 370  | 625 | 800 | 915  | 1190 | 950  | 970 |
| 25  | 1140 | 1110 | 1290 | 1600 | 1800 | 395  | 605 | 795 | 980  | 1220 | 910  | 975 |
| 26  | 1150 | 1130 | 1300 | 1600 | 1820 | 510  | 600 | 735 | 1030 | 1220 | 905  | 980 |
| 27  | 1120 | 1140 | 1330 | 1620 | 1830 | 480  | 585 | 765 | 1030 | 1220 | 905  | 985 |
| 28  | 1130 | 1150 | 1310 | 1640 | 1800 | 420  | 600 | 790 | 1020 | 1220 | 905  | 995 |
| 29  | 1090 | 1190 | 1370 | 1650 | 1800 | 540  | 570 | 800 | 1040 | 1230 | 915  | 985 |
| 30  | 1110 | 1170 | 1370 | 1670 | ---  | 545  | 680 | 810 | 1070 | 1240 | 935  | 995 |
| 31  | 1110 | ---  | 1390 | 1690 | ---  | 540  | --- | 825 | ---  | 1250 | 955  | --- |
| AVG | 1130 | 1170 | 1230 | 1560 | 1760 | 999  | 576 | 745 | 885  | 1190 | 1110 | 947 |

## JAMES RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV | DEC | JAN | FEB | MAR | APR  | MAY  | JUN  | JUL  | AUG  | SEP  |
|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| 1   | 17.0 | 3.0 | 0.0 | 1.0 | 1.0 | 1.0 | 4.0  | 11.0 | 18.0 | 24.0 | 24.0 | 20.0 |
| 2   | 15.0 | 4.0 | 0.0 | 2.0 | 1.0 | 1.0 | 5.0  | 11.0 | 20.0 | 23.0 | 23.0 | 20.0 |
| 3   | 16.0 | 3.0 | 0.0 | 1.0 | 1.0 | 1.0 | 5.0  | 10.0 | 22.0 | 21.0 | 20.0 | 18.0 |
| 4   | 13.0 | 3.0 | 0.0 | 1.0 | 1.0 | 1.0 | 5.0  | 9.0  | 23.0 | 20.0 | 20.0 | 18.0 |
| 5   | 13.0 | 3.0 | 0.0 | 1.0 | 1.0 | 1.0 | 5.0  | 11.0 | 22.0 | 20.0 | 22.0 | 18.0 |
| 6   | 14.0 | 1.0 | 0.0 | 1.0 | 1.0 | 1.0 | 5.0  | 11.0 | 23.0 | 20.0 | 22.0 | 20.0 |
| 7   | 14.0 | 0.0 | 0.0 | 1.0 | 1.0 | 1.0 | 6.0  | 10.0 | 24.0 | 21.0 | 21.0 | 20.0 |
| 8   | 13.0 | 1.0 | 0.0 | 3.0 | 1.0 | 1.0 | 6.0  | 11.0 | 23.0 | 23.0 | 21.0 | 18.0 |
| 9   | 11.0 | 2.0 | 0.0 | 2.0 | 1.0 | 2.0 | 6.0  | 11.0 | 25.0 | 24.0 | 21.0 | 18.0 |
| 10  | 10.0 | 3.0 | 0.0 | 1.0 | 1.0 | 2.0 | 8.0  | 12.0 | 24.0 | 24.0 | 20.0 | 19.0 |
| 11  | 10.0 | 4.0 | 0.0 | 2.0 | 1.0 | 2.0 | 8.0  | 12.0 | 24.0 | 25.0 | 21.0 | 19.0 |
| 12  | 10.0 | 4.0 | 0.0 | 2.0 | 1.0 | 2.0 | 8.0  | 13.0 | 22.0 | 25.0 | 23.0 | 20.0 |
| 13  | 10.0 | 5.0 | 0.0 | 1.0 | 2.0 | 2.0 | 8.0  | 12.0 | 24.0 | 24.0 | 25.0 | 20.0 |
| 14  | 10.0 | 5.0 | 0.0 | 1.0 | 2.0 | 2.0 | 8.0  | 12.0 | 23.0 | 24.0 | 25.0 | 20.0 |
| 15  | 10.0 | 5.0 | 1.0 | 0.0 | 1.0 | 2.0 | 8.0  | 13.0 | 22.0 | 22.0 | 26.0 | 18.0 |
| 16  | 10.0 | 5.0 | 1.0 | 1.0 | 1.0 | 2.0 | 8.0  | 16.0 | 22.0 | 22.0 | 26.0 | 18.0 |
| 17  | 11.0 | 5.0 | 1.0 | 1.0 | 1.0 | 2.0 | 11.0 | 18.0 | 21.0 | 23.0 | 27.0 | 18.0 |
| 18  | 14.0 | 4.0 | 1.0 | 2.0 | 1.0 | 2.0 | 10.0 | 20.0 | 21.0 | 22.0 | 26.0 | 17.0 |
| 19  | 13.0 | 2.0 | 1.0 | 2.0 | 1.0 | 2.0 | 10.0 | 20.0 | 20.0 | 23.0 | 27.0 | 20.0 |
| 20  | 12.0 | 3.0 | 1.0 | 1.0 | 2.0 | 3.0 | 10.0 | 21.0 | 18.0 | 23.0 | 27.0 | 20.0 |
| 21  | 11.0 | 1.0 | 1.0 | 1.0 | 2.0 | 2.0 | 10.0 | 22.0 | 17.0 | 21.0 | 27.0 | 17.0 |
| 22  | 12.0 | 1.0 | 1.0 | 2.0 | 1.0 | 2.0 | 10.0 | 22.0 | 18.0 | 23.0 | 24.0 | 15.0 |
| 23  | 11.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 10.0 | 20.0 | 20.0 | 24.0 | 22.0 | 16.0 |
| 24  | 11.0 | 1.0 | 1.0 | 1.0 | 1.0 | 2.0 | 9.0  | 19.0 | 20.0 | 25.0 | 20.0 | 15.0 |
| 25  | 11.0 | 2.0 | 2.0 | 0.0 | 1.0 | 3.0 | 9.0  | 19.0 | 19.0 | 25.0 | 20.0 | 14.0 |
| 26  | 10.0 | 2.0 | 1.0 | 0.0 | 1.0 | 3.0 | 9.0  | 20.0 | 20.0 | 25.0 | 20.0 | 12.0 |
| 27  | 12.0 | 2.0 | 1.0 | 0.0 | 2.0 | 3.0 | 10.0 | 21.0 | 22.0 | 25.0 | 21.0 | 12.0 |
| 28  | 9.0  | 1.0 | 1.0 | 0.0 | 1.0 | 3.0 | 10.0 | 21.0 | 21.0 | 24.0 | 22.0 | 12.0 |
| 29  | 5.0  | 1.0 | 0.0 | 1.0 | 1.0 | 3.0 | 10.0 | 21.0 | 22.0 | 24.0 | 23.0 | 12.0 |
| 30  | 5.0  | 0.0 | 1.0 | 1.0 | --- | 3.0 | 11.0 | 18.0 | 23.0 | 24.0 | 23.0 | 12.0 |
| 31  | 3.0  | --- | 1.0 | 1.0 | --- | 4.0 | ---  | 18.0 | ---  | 24.0 | 23.0 | ---  |
| AVG | 11.0 | 2.5 | 0.5 | 1.0 | 1.0 | 2.0 | 8.0  | 15.5 | 21.5 | 23.0 | 23.0 | 17.0 |

## 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, 9.0 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 1972 (discontinued).  
Water temperatures: October 1968 to September 1972 (discontinued).

## EXTREMES.--1971-72:

Dissolved solids: Maximum, 1,230 mg/l Feb. 1-29; minimum, 342 mg/l Apr. 1-30.

Hardness: Maximum, 570 mg/l Feb. 1-29; minimum, 160 mg/l Apr. 1-30.

Specific conductance: Maximum daily, 1,950 micromhos Feb. 7; minimum daily, 385 micromhos Mar. 29-31.

Water temperatures: Maximum, 29.0°C Aug. 20; minimum, freezing point on many days during December to March.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 36                                 | 8.7                                                     | 80                                                          | 45                                                                 | 130                                                   | 17                                                                | 366                                             | 280                                                     | 58                                                           | .3                                                          | .43                                                                      |
| NOV.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 71                                 | 8.1                                                     | 82                                                          | 43                                                                 | 130                                                   | 15                                                                | 364                                             | 300                                                     | 73                                                           | .4                                                          | .29                                                                      |
| DEC.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 95                                 | 17                                                      | 86                                                          | 51                                                                 | 150                                                   | 15                                                                | 359                                             | 300                                                     | 68                                                           | .4                                                          | .50                                                                      |
| JAN.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 74                                 | 22                                                      | 110                                                         | 62                                                                 | 170                                                   | 19                                                                | 493                                             | 380                                                     | 74                                                           | .5                                                          | 1.1                                                                      |
| FEB.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 26                                 | 24                                                      | 110                                                         | 71                                                                 | 190                                                   | 21                                                                | 508                                             | 470                                                     | 83                                                           | .6                                                          | 1.9                                                                      |
| MAR.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1030                               | 10                                                      | 50                                                          | 24                                                                 | 63                                                    | 13                                                                | 183                                             | 180                                                     | 28                                                           | .3                                                          | 1.7                                                                      |
| APR.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 1240                               | 11                                                      | 37                                                          | 17                                                                 | 41                                                    | 13                                                                | 146                                             | 120                                                     | 24                                                           | .3                                                          | 1.2                                                                      |
| MAY                 |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 2450                               | 14                                                      | 53                                                          | 24                                                                 | 54                                                    | 14                                                                | 192                                             | 170                                                     | 25                                                           | .3                                                          | .66                                                                      |
| JUNE                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 1830                               | 19                                                      | 61                                                          | 29                                                                 | 64                                                    | 16                                                                | 247                                             | 180                                                     | 30                                                           | .3                                                          | .60                                                                      |
| JULY                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 348                                | 15                                                      | 78                                                          | 39                                                                 | 98                                                    | 16                                                                | 312                                             | 270                                                     | 43                                                           | .3                                                          | .77                                                                      |
| AUG.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 268                                | 20                                                      | 80                                                          | 40                                                                 | 100                                                   | 18                                                                | 338                                             | 260                                                     | 49                                                           | .4                                                          | .67                                                                      |
| SEP.                |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 68                                 | 22                                                      | 81                                                          | 40                                                                 | 94                                                    | 17                                                                | 294                                             | 310                                                     | 34                                                           | .4                                                          | .66                                                                      |
| WTD. AVG.           | --   | --                                 | 14                                                      | 56                                                          | 27                                                                 | 63                                                    | 15                                                                | 216                                             | 180                                                     | 30                                                           | .3                                                          | .89                                                                      |
| TIME WTD.           |      |                                    |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| AVG.                | --   | 629                                | 16                                                      | 76                                                          | 40                                                                 | 107                                                   | 16                                                                | 317                                             | 267                                                     | 49                                                           | .4                                                          | .87                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                 | 8930                                                    | 34300                                                       | 16300                                                              | 39000                                                 | 8960                                                              | 133000                                          | 111000                                                  | 18500                                                        | 190                                                         | 546                                                                      |

NOTE.--Carbonate (CO3) analysis for all samples, 0.0 mg/l.

## JAMES RIVER BASIN

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1968-69, 1970-72): Maximum, 2,140 mg/l Jan. 1-31, 1971; minimum, 215 mg/l Apr. 4-30, 1969.

Hardness (1968-69, 1970-72): Maximum, 850 mg/l Jan. 1-31, 1971; minimum, 101 mg/l Apr. 4-30, 1969.

Specific conductance (1968-69, 1971-72): Maximum daily, 2,440 micromhos Dec. 27, 1968; minimum daily, 220 micromhos Apr. 10, 1969.

Water temperatures (1968-69, 1971-72): 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.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(MG/L)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(MG/L)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) |
|---------------------|-----------------------------------------------------------|--------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|
| OCT.<br>01-31       | --                                                        | .11                                        | 430                                       | 802                                                                       | 1.09                                                                    | 78.0                                                                  | 380                                           | 85                                                           | 2.9                                                | 1230                                                                  | 8.0                      |
| NOV.<br>01-30       | --                                                        | .29                                        | 420                                       | 833                                                                       | 1.13                                                                    | 160                                                                   | 380                                           | 83                                                           | 2.9                                                | 1330                                                                  | 8.0                      |
| DEC.<br>01-31       | .35                                                       | .37                                        | 400                                       | 867                                                                       | 1.18                                                                    | 222                                                                   | 420                                           | 130                                                          | 3.2                                                | 1360                                                                  | 8.1                      |
| JAN.<br>01-31       | .45                                                       | .59                                        | 470                                       | 1090                                                                      | 1.48                                                                    | 218                                                                   | 530                                           | 130                                                          | 3.2                                                | 1610                                                                  | 7.8                      |
| FEB.<br>01-29       | .52                                                       | .52                                        | 510                                       | 1230                                                                      | 1.67                                                                    | 86.3                                                                  | 570                                           | 150                                                          | 3.5                                                | 1780                                                                  | 8.1                      |
| MAR.<br>01-31       | .54                                                       | .56                                        | 190                                       | 467                                                                       | .64                                                                     | 1300                                                                  | 220                                           | 74                                                           | 1.8                                                | 741                                                                   | 7.8                      |
| APR.<br>01-30       | .36                                                       | .39                                        | 150                                       | 342                                                                       | .47                                                                     | 1150                                                                  | 160                                           | 43                                                           | 1.4                                                | 564                                                                   | 8.0                      |
| MAY<br>01-31        | .37                                                       | .41                                        | 180                                       | 453                                                                       | .62                                                                     | 3000                                                                  | 230                                           | 74                                                           | 1.5                                                | 716                                                                   | 7.5                      |
| JUNE<br>01-30       | .52                                                       | .55                                        | 200                                       | 525                                                                       | .71                                                                     | 2590                                                                  | 270                                           | 69                                                           | 1.7                                                | 829                                                                   | 7.6                      |
| JULY<br>01-31       | .21                                                       | .21                                        | 330                                       | 717                                                                       | .98                                                                     | 674                                                                   | 360                                           | 99                                                           | 2.3                                                | 1100                                                                  | 8.3                      |
| AUG.<br>01-31       | .19                                                       | .26                                        | 410                                       | 737                                                                       | 1.00                                                                    | 533                                                                   | 360                                           | 87                                                           | 2.3                                                | 1140                                                                  | 8.2                      |
| SEP.<br>01-30       | .22                                                       | .22                                        | 350                                       | 747                                                                       | 1.02                                                                    | --                                                                    | 370                                           | 130                                                          | 2.1                                                | 1080                                                                  | 8.2                      |
| WTD. AVG.           | --                                                        | .44                                        | 207                                       | 497                                                                       | .68                                                                     | --                                                                    | 246                                           | 71                                                           | 1.7                                                | 785                                                                   | 7.7                      |
| TIME WTD.<br>AVG.   | --                                                        | .37                                        | 336                                       | 733                                                                       | .00                                                                     | --                                                                    | 353                                           | 96                                                           | 2.4                                                | 1120                                                                  | 8.0                      |
| TOT. LOAD<br>(TCNS) | --                                                        | 275                                        | 128                                       | 306000                                                                    | --                                                                      | --                                                                    | --                                            | --                                                           | --                                                 | --                                                                    | --                       |

## JAMES RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC   | JAN  | FEB   | MAR  | APR | MAY | JUN  | JUL  | AUG  | SEP   |
|-----|------|------|-------|------|-------|------|-----|-----|------|------|------|-------|
| 1   | 1220 | 1240 | 1390  | 1310 | 1880  | 1600 | 418 | 585 | 730  | 1110 | 1030 | 1100  |
| 2   | 1200 | 1240 | 1390  | 1300 | 1870  | 1540 | 445 | 665 | 670  | 1110 | 1030 | 1050  |
| 3   | 1220 | 1240 | 1380  | 1270 | 1850  | 1540 | 500 | 680 | 700  | 1120 | 1070 | 1040  |
| 4   | 1220 | 1220 | 1370  | 1400 | 1870  | 1650 | 500 | 680 | 730  | 1120 | 1060 | 1040  |
| 5   | 1220 | 1160 | 1360  | 1400 | 1900  | 1700 | 533 | 665 | 720  | 1170 | 1130 | 1040  |
| 6   | 1220 | 1260 | 1350  | 1400 | 1900  | 1290 | 595 | 690 | 725  | 1170 | 1090 | 1030  |
| 7   | 1200 | 1260 | 1280  | 1400 | 1950  | 445  | 575 | 710 | 725  | 1180 | 1130 | 1060  |
| 8   | 1210 | 1260 | 1270  | 1420 | 1750  | 470  | 573 | 690 | 755  | 1170 | 1130 | 1090  |
| 9   | 1240 | 1200 | 1300  | 1410 | 1840  | 475  | 558 | 690 | 775  | 1210 | 1130 | 1090  |
| 10  | 1240 | 1230 | 1300  | 1400 | 1870  | 650  | 560 | 690 | 805  | 1210 | 1130 | 1090  |
| 11  | 1220 | 1230 | 1290  | 1400 | 1870  | 640  | 560 | 700 | 820  | 1210 | 1130 | 1070  |
| 12  | 1240 | 1230 | 1290  | 1400 | 1850  | 700  | 553 | 735 | 835  | 1200 | 1130 | 1070  |
| 13  | 1260 | 1250 | 1260  | 1560 | 1860  | 530  | 530 | 735 | 845  | 1210 | 1130 | 1120  |
| 14  | 1260 | 1220 | 1260  | 1560 | 1880  | 710  | 545 | 700 | 860  | 1220 | 1130 | 1130  |
| 15  | 1280 | 1180 | 1260  | 1570 | 1910  | 760  | 525 | 750 | 880  | 1250 | 1130 | 1120  |
| 16  | 1280 | 1230 | 1300  | 1540 | 1850  | 690  | 530 | 730 | 905  | 1240 | 1160 | 1130  |
| 17  | 1280 | 1230 | ---   | 1570 | 1870  | 820  | 550 | 725 | 920  | 1240 | 1170 | 1140  |
| 18  | 1280 | 1240 | 1290  | 1540 | 1880  | 460  | 605 | 745 | 965  | 1300 | 1170 | 1140  |
| 19  | 1280 | 1210 | 1280  | 1570 | 1850  | 420  | 575 | 715 | 975  | 1300 | 1160 | 1130  |
| 20  | 1280 | 1220 | 1300  | 1560 | 1870  | 500  | 575 | 710 | 995  | 1300 | 1160 | 1130  |
| 21  | 1280 | 1200 | 1270  | 1560 | 1840  | 680  | 580 | 720 | 995  | 1300 | 1280 | 1140  |
| 22  | 1280 | 1260 | 1240  | 1630 | 1850  | 670  | 580 | 725 | 990  | 1290 | 1180 | 1150  |
| 23  | 1300 | 1690 | 1280  | 1650 | 1900  | 590  | 575 | 715 | 990  | 1190 | 1200 | 1160  |
| 24  | 1290 | 1690 | ---   | 1660 | 1850  | 540  | 580 | 735 | 1000 | 1200 | 1270 | 1160  |
| 25  | 1310 | 1690 | 1290  | 1560 | 1900  | 560  | 610 | 710 | 995  | 1000 | 1270 | 1160  |
| 26  | 1280 | 1700 | 1290  | 1670 | 1670  | 620  | 625 | 730 | 985  | 910  | 1310 | 1160  |
| 27  | 1260 | 1410 | 1290  | 1550 | 1680  | 415  | 620 | 760 | 985  | 910  | 1320 | ---   |
| 28  | 1280 | 1600 | 1280  | 1700 | 1680  | 390  | 625 | 700 | 985  | 900  | 1190 | ---   |
| 29  | 1220 | 1490 | 1260  | 1700 | ---   | 385  | 625 | 640 | 1000 | 910  | 1110 | ---   |
| 30  | 1260 | 1490 | 1300  | 1720 | ---   | 385  | 620 | 640 | 995  | 910  | 1290 | ---   |
| 31  | 1240 | ---  | 1310  | 1720 | ---   | 385  | --- | 645 | ---  | 1000 | 1280 | ---   |
| AVG | 1250 | 1330 | A1300 | 1520 | B1850 | 749  | 562 | 700 | 875  | 1150 | 1160 | C1110 |

A Based on 29 days of data.

B Based on 28 days of data.

C Based on 26 days of data.

## JAMES RIVER BASIN

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

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV | DEC | JAN | FEB | MAR | APR  | MAY  | JUN  | JUL  | AUG  | SEP   |
|-----|------|-----|-----|-----|-----|-----|------|------|------|------|------|-------|
| 1   | ---  | 6.0 | 1.0 | 0.0 | 0.0 | 0.0 | 4.0  | 9.0  | 20.0 | 25.0 | 26.0 | 22.0  |
| 2   | ---  | 6.0 | 1.0 | 0.0 | 0.0 | 0.0 | 6.0  | 9.0  | 20.0 | 25.0 | 25.0 | 22.0  |
| 3   | ---  | 6.0 | 1.0 | 0.0 | 0.0 | 0.0 | 5.0  | 9.0  | 20.0 | 25.0 | 25.0 | 22.0  |
| 4   | ---  | 6.0 | 1.0 | 0.0 | 0.0 | 0.0 | 4.0  | 10.0 | 18.0 | 24.0 | 24.0 | 21.0  |
| 5   | ---  | 4.0 | 1.0 | 0.0 | 0.0 | 0.0 | 5.0  | 11.0 | 18.0 | 24.0 | 24.0 | 21.0  |
| 6   | ---  | 3.0 | 1.0 | 0.0 | 0.0 | 2.0 | 6.0  | 11.0 | 18.0 | 24.0 | 25.0 | 21.0  |
| 7   | ---  | 2.0 | 1.0 | 0.0 | 0.0 | 1.0 | 7.0  | 12.0 | 18.0 | 25.0 | 25.0 | 21.0  |
| 8   | ---  | 2.0 | 1.0 | 0.0 | 0.0 | 1.0 | 8.0  | 13.0 | 20.0 | 25.0 | 25.0 | 21.0  |
| 9   | ---  | 4.0 | 1.0 | 0.0 | 0.0 | 1.0 | 8.0  | 14.0 | 20.0 | 25.0 | 24.0 | 20.0  |
| 10  | ---  | 4.0 | 1.0 | 0.0 | 0.0 | 1.0 | 9.0  | 15.0 | 20.0 | 25.0 | 24.0 | 20.0  |
| 11  | ---  | 5.0 | 1.0 | 0.0 | 0.0 | 1.0 | 9.0  | 15.0 | 21.0 | 25.0 | 25.0 | 20.0  |
| 12  | ---  | 5.0 | 0.0 | 0.0 | 0.0 | 1.0 | 10.0 | 15.0 | 21.0 | 26.0 | 25.0 | 20.0  |
| 13  | 14.0 | 8.0 | 0.0 | 0.0 | 0.0 | 2.0 | 10.0 | 16.0 | 21.0 | 26.0 | 25.0 | 20.0  |
| 14  | 14.0 | 9.0 | 0.0 | 0.0 | 0.0 | 3.0 | 11.0 | 17.0 | 22.0 | 26.0 | 26.0 | 20.0  |
| 15  | 14.0 | 9.0 | 0.0 | 0.0 | 1.0 | 3.0 | 11.0 | 19.0 | 22.0 | 25.0 | 26.0 | 20.0  |
| 16  | 13.0 | 8.0 | 0.0 | 0.0 | 1.0 | 3.0 | 12.0 | 19.0 | 22.0 | 24.0 | 26.0 | 19.0  |
| 17  | 13.0 | 6.0 | 0.0 | 0.0 | 1.0 | 3.0 | 13.0 | 20.0 | 21.0 | 24.0 | 27.0 | 19.0  |
| 18  | 14.0 | 4.0 | 0.0 | 0.0 | 1.0 | 4.0 | 12.0 | 21.0 | 21.0 | 24.0 | 28.0 | 18.0  |
| 19  | 15.0 | 5.0 | 0.0 | 0.0 | 1.0 | 5.0 | 12.0 | 22.0 | 21.0 | 24.0 | 28.0 | 18.0  |
| 20  | 16.0 | 5.0 | 0.0 | 0.0 | 0.0 | 5.0 | 10.0 | 22.0 | 20.0 | 24.0 | 29.0 | 17.0  |
| 21  | 16.0 | 3.0 | 0.0 | 0.0 | 0.0 | 6.0 | 9.0  | 23.0 | 20.0 | 25.0 | 28.0 | 17.0  |
| 22  | 16.0 | 3.0 | 0.0 | 0.0 | 0.0 | 7.0 | 10.0 | 23.0 | 21.0 | 25.0 | 28.0 | 17.0  |
| 23  | 15.0 | 3.0 | 0.0 | 0.0 | 0.0 | 7.0 | 11.0 | 22.0 | 22.0 | 25.0 | 27.0 | 17.0  |
| 24  | 15.0 | 3.0 | 0.0 | 0.0 | 0.0 | 6.0 | 11.0 | 22.0 | 24.0 | 25.0 | 27.0 | 17.0  |
| 25  | 14.0 | 2.0 | 0.0 | 0.0 | 1.0 | 3.0 | 12.0 | 23.0 | 23.0 | 25.0 | 26.0 | 16.0  |
| 26  | 13.0 | 2.0 | 0.0 | 0.0 | 1.0 | 3.0 | 11.0 | 22.0 | 22.0 | 26.0 | 25.0 | 16.0  |
| 27  | 11.0 | 2.0 | 0.0 | 0.0 | 1.0 | 2.0 | 11.0 | 21.0 | 23.0 | 26.0 | 25.0 | ---   |
| 28  | 7.0  | 2.0 | 0.0 | 0.0 | 1.0 | 2.0 | 10.0 | 20.0 | 23.0 | 26.0 | 25.0 | ---   |
| 29  | 5.0  | 2.0 | 0.0 | 0.0 | 1.0 | 2.0 | 10.0 | 20.0 | 24.0 | 27.0 | 24.0 | ---   |
| 30  | 4.0  | 2.0 | 0.0 | 0.0 | --- | 2.0 | 10.0 | 19.0 | 25.0 | 27.0 | 23.0 | ---   |
| 31  | 4.0  | --- | 0.0 | 0.0 | --- | 2.0 | ---  | 20.0 | ---  | 27.0 | 23.0 | ---   |
| AVG | ---  | 4.5 | 0.5 | 0.0 | 0.5 | 2.5 | 9.0  | 17.0 | 21.0 | 25.0 | 25.5 | C19.5 |

C Based on 26 days of data.

## 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.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | CAR-<br>BONATE<br>(CO3)<br>(MG/L)<br>(00445) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) |
|---------------|------|------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|
| OCT.<br>27... | 1050 | 50                                 | 120                                                         | 58                                                                 | 140                                                   | 17                                                                | 355                                             | 0                                            | 480                                                     | 65                                                           | .6                                                          |
| NOV.<br>16... | 1013 | 70                                 | 120                                                         | 53                                                                 | --                                                    | --                                                                | --                                              | --                                           | 110                                                     | 55                                                           | --                                                          |
| DEC.<br>07... | 1225 | 93                                 | 120                                                         | 54                                                                 | --                                                    | --                                                                | --                                              | --                                           | 440                                                     | 52                                                           | --                                                          |
| JAN.<br>30... | 1515 | 97                                 | 150                                                         | 67                                                                 | 160                                                   | 22                                                                | 513                                             | 0                                            | 470                                                     | 71                                                           | .5                                                          |
| FEB.<br>29... | 1100 | 918                                | 62                                                          | 27                                                                 | --                                                    | --                                                                | --                                              | --                                           | 190                                                     | 29                                                           | --                                                          |
| MAR.<br>31... | 1140 | 1960                               | 35                                                          | 14                                                                 | --                                                    | --                                                                | --                                              | --                                           | 110                                                     | 34                                                           | --                                                          |
| APR.<br>28... | 1105 | 940                                | 52                                                          | 21                                                                 | 57                                                    | 13                                                                | 180                                             | 0                                            | 150                                                     | 28                                                           | .3                                                          |
| MAY<br>30...  | 1130 | 3580                               | 74                                                          | 27                                                                 | --                                                    | --                                                                | --                                              | --                                           | 210                                                     | 24                                                           | --                                                          |
| JUNE<br>29... | 1035 | 780                                | 100                                                         | 44                                                                 | --                                                    | --                                                                | --                                              | --                                           | 340                                                     | 41                                                           | --                                                          |
| AUG.<br>23... | 1045 | 302                                | 100                                                         | 45                                                                 | 110                                                   | 19                                                                | 345                                             | 0                                            | 340                                                     | 46                                                           | .4                                                          |
| SEP.<br>28... | 1330 | 63                                 | 120                                                         | 51                                                                 | 97                                                    | 15                                                                | 317                                             | 0                                            | 410                                                     | 42                                                           | .4                                                          |

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00618) | DIS-<br>SOLVED<br>NITRITE<br>(N)<br>(MG/L)<br>(00613) | DIS-<br>SOLVED<br>AMMONIA<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00608) | ORGANIC<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00605) | TOTAL<br>KJEL-<br>DAHL<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00625) | TOTAL<br>NITRO-<br>GEN<br>(N)<br>(MG/L)<br>(00600) | DIS-<br>SOLVED<br>ORTHO-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00671) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|------|------------------------------------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------|
| OCT.<br>27... | 1050 | 50                                 | --                                                    | --                                                    | .45                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 9.5                                    |
| NOV.<br>16... | 1013 | 70                                 | .24                                                   | .000                                                  | .10                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 7.2                                    |
| DEC.<br>07... | 1225 | 98                                 | .05                                                   | .000                                                  | .13                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| JAN.<br>30... | 1515 | 97                                 | --                                                    | --                                                    | .57                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | .0                                     |
| FEB.<br>29... | 1100 | 918                                | .65                                                   | .010                                                  | 1.9                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 1.0                                    |
| MAR.<br>31... | 1140 | 1960                               | .68                                                   | .010                                                  | .86                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | --                                     |
| APR.<br>28... | 1105 | 940                                | --                                                    | --                                                    | .09                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 9.6                                    |
| MAY<br>30...  | 1130 | 3580                               | .02                                                   | .000                                                  | .07                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | --                                     |
| JUNE<br>29... | 1035 | 780                                | .03                                                   | .000                                                  | .13                                                                    | --                                                   | --                                                                  | --                                                 | --                                                                      | 23.8                                   |
| AUG.<br>23... | 1045 | 302                                | .01                                                   | .010                                                  | .28                                                                    | 1.8                                                  | 2.1                                                                 | 2.1                                                | .060                                                                    | 23.4                                   |
| SEP.<br>28... | 1330 | 63                                 | .00                                                   | .010                                                  | .11                                                                    | 1.7                                                  | 1.8                                                                 | 1.8                                                | .040                                                                    | 13.2                                   |

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(MG/L)<br>(01056) | CYANIDE<br>(CN)<br>(MG/L)<br>(00720) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BERYL-<br>LIUM<br>(BE)<br>(UG/L)<br>(01010) | DIS-<br>SOLVED<br>CAO-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|------------------------------------|---------------------------------------------------------------|--------------------------------------|--------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| OCT.<br>27... | 1050 | 50                                 | 710                                                           | .00                                  | 0                                                      | 0                                                             | 1                                                           | 0                                                            | 4                                                     |
| JAN.<br>30... | 1515 | 97                                 | 450                                                           | .00                                  | 10                                                     | 0                                                             | 1                                                           | 0                                                            | 6                                                     |
| APR.<br>28... | 1105 | 940                                | 0                                                             | .00                                  | 10                                                     | 0                                                             | 1                                                           | --                                                           | 3                                                     |



## JAMES RIVER BASIN

97

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

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

PERIOD OF RECORD.--Chemical analyses: August 1956 to September 1964, July 1967 to September 1972.  
Water temperatures: January 1953 to September 1969.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE       | DIS-SOLVED NITRITE PLUS NITRATE (MG/L) (006311) | 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) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM ADSORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|------------|-------------------------------------------------|-------------------------------------|-----------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|-------------------------------------------|--------------------|-----------------------------|
| OCT. 27... | .02                                             | 530                                 | 276                                                 | .38                                        | 37.3                                     | 540                              | 250                                   | 2.6                             | 1530                                      | 7.7                | 9.5                         |
| NOV. 16... | .24                                             | --                                  | 984                                                 | 1.34                                       | 187                                      | --                               | --                                    | --                              | 1410                                      | 7.5                | 7.2                         |
| DEC. 07... | .05                                             | --                                  | 1020                                                | 1.39                                       | 270                                      | --                               | --                                    | --                              | 1390                                      | 8.5                | .0                          |
| JAN. 30... | .42                                             | 520                                 | 1240                                                | 1.69                                       | 325                                      | 650                              | 230                                   | 2.7                             | 1730                                      | 7.7                | .0                          |
| FEB. 29... | .66                                             | --                                  | 538                                                 | .73                                        | 1330                                     | 270                              | --                                    | --                              | 765                                       | 7.1                | 1.0                         |
| MAR. 31... | .69                                             | --                                  | 370                                                 | .50                                        | 1960                                     | 150                              | --                                    | --                              | 562                                       | 7.3                | --                          |
| APR. 28... | .00                                             | 210                                 | 464                                                 | .63                                        | 1180                                     | 220                              | 69                                    | 1.7                             | 686                                       | 7.5                | 9.6                         |
| MAY 30...  | .02                                             | --                                  | 560                                                 | .76                                        | 5410                                     | 300                              | --                                    | --                              | 810                                       | 7.5                | --                          |
| JUNE 29... | .03                                             | --                                  | 880                                                 | 1.20                                       | 1850                                     | 430                              | --                                    | --                              | 1190                                      | 7.8                | 23.8                        |
| AUG. 23... | .02                                             | --                                  | 908                                                 | 1.23                                       | 740                                      | 430                              | 150                                   | 2.3                             | 1260                                      | 8.0                | 23.4                        |
| SEP. 28... | .00                                             | --                                  | 1050                                                | 1.43                                       | 179                                      | 510                              | 250                                   | 1.9                             | 1330                                      | 7.9                | 13.2                        |

## FIELD DETERMINATIONS

| DATE       | TIME | DIS-CHARGE (CFS) (00060) | DIS-SOLVED OXYGEN (MG/L) (00300) | BIO-CHEMICAL OXYGEN DEMAND (MG/L) (00310) | PH (UNITS) (00400) | IMMEDIATE COLIFORM (COL. PER 100 ML) (31501) | FECAL COLIFORM (COL. PER 100 ML) (31616) | TEMPERATURE (DEG C) (00010) | AIR TEMPERATURE (DEG C) (00020) |
|------------|------|--------------------------|----------------------------------|-------------------------------------------|--------------------|----------------------------------------------|------------------------------------------|-----------------------------|---------------------------------|
| OCT. 27... | 1050 | 50                       | 8.2                              | 5.2                                       | 8.1                | --                                           | 300                                      | 9.5                         | -5                              |
| NOV. 16... | 1013 | 70                       | 10.7                             | 3.2                                       | 8.7                | --                                           | 590                                      | 7.2                         | 8.9                             |
| DEC. 07... | 1225 | 98                       | 20.6                             | 7.3                                       | 8.3                | --                                           | 15                                       | .0                          | -1.0                            |
| JAN. 30... | 1515 | 97                       | 7.3                              | 5.0                                       | 8.0                | --                                           | 29                                       | .0                          | -4.0                            |
| FEB. 29... | 1100 | 918                      | 8.8                              | 6.8                                       | 7.5                | --                                           | 100                                      | 1.0                         | 1.5                             |
| MAR. 31... | 1140 | 1960                     | 12.4                             | 4.9                                       | 7.2                | --                                           | 500                                      | 2.4                         | .0                              |
| APR. 28... | 1105 | 940                      | 8.8                              | 3.9                                       | 7.6                | --                                           | 300                                      | 9.6                         | 9.7                             |
| MAY 30...  | 1130 | 3580                     | 6.8                              | 3.3                                       | --                 | --                                           | 220                                      | --                          | --                              |
| JUNE 29... | 1035 | 780                      | 5.7                              | 4.4                                       | 8.1                | --                                           | 230                                      | 23.8                        | 26.8                            |
| AUG. 23... | 1045 | 302                      | 8.0                              | 4.8                                       | 8.3                | 280                                          | 170                                      | 23.4                        | 25.1                            |
| SEP. 28... | 1330 | 63                       | 9.8                              | 6.2                                       | 8.4                | 2670                                         | 70                                       | 13.2                        | 12.2                            |

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE       | DIS-SOLVED LEAD (PB) (UG/L) (01049) | TOTAL MERCURY (HG) (UG/L) (71900) | 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 VANADIUM (V) (UG/L) (01085) | DIS-SOLVED ZINC (ZN) (UG/L) (01090) |
|------------|-------------------------------------|-----------------------------------|-------------------------------------------|---------------------------------------|-----------------------------------------|---------------------------------------|----------------------------------------|-------------------------------------|
| OCT. 27... | 0                                   | .2                                | 1                                         | 5                                     | 7                                       | 0                                     | 2.7                                    | 10                                  |
| JAN. 30... | 1                                   | .2                                | 13                                        | 8                                     | 10                                      | 0                                     | .8                                     | 8                                   |
| APR. 28... | 3                                   | .2                                | 0                                         | 8                                     | 9                                       | 1                                     | 1.6                                    | 8                                   |

## JAMES RIVER BASIN

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## PESTICIDES

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | ALDRIN<br>(UG/L)<br>(39330) | CHLOR-<br>DANE<br>(UG/L)<br>(39350) | DDD<br>(UG/L)<br>(39360) | DDE<br>(UG/L)<br>(39365) | DDT<br>(UG/L)<br>(39370) | DI-<br>ELDRIN<br>(UG/L)<br>(39380) |
|---------------|------|------------------------------------|-----------------------------|-------------------------------------|--------------------------|--------------------------|--------------------------|------------------------------------|
| OCT.<br>27... | 1050 | 50                                 | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |
| JAN.<br>30... | 1515 | 97                                 | .00                         | .0                                  | .00                      | .00                      | .00                      | .01                                |
| APR.<br>28... | 1105 | 940                                | .00                         | .0                                  | .00                      | .00                      | .00                      | .00                                |

| DATE          | ENDRIN<br>(UG/L)<br>(39390) | HEPTA-<br>CHLOR<br>(UG/L)<br>(39410) | HEPTA-<br>CHLOR<br>EPOXIDE<br>(UG/L)<br>(39420) | LINDANE<br>(UG/L)<br>(39340) | 2,4-D<br>(UG/L)<br>(39730) | 2,4,5-T<br>(UG/L)<br>(39740) | SILVEX<br>(UG/L)<br>(39760) |
|---------------|-----------------------------|--------------------------------------|-------------------------------------------------|------------------------------|----------------------------|------------------------------|-----------------------------|
| OCT.<br>27... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |
| JAN.<br>30... | .00                         | .00                                  | .00                                             | .06                          | .00                        | .00                          | .00                         |
| APR.<br>28... | .00                         | .00                                  | .00                                             | .00                          | .00                        | .00                          | .00                         |

## VERMILLION RIVER BASIN

06479000 VERMILLION RIVER NEAR WAKONDA, S. DAK.

LOCATION.--Lat 42°59'27", long 96°57'49", in SW 1/4 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 29.6 miles upstream from mouth.

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

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1972 (partial-record station).

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

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRATE<br>PLUS<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|
| NOV.<br>04... | 1045 | 8.7                                | 16                                                      | 140                                                         | 59                                                                 | 39                                                    | 7.3                                                               | 266                                             | 420                                                     | 8.6                                                          | .3                                                          | .18                                                           |
| APR.<br>25... | 1510 | 86                                 | 6.0                                                     | 150                                                         | 64                                                                 | 40                                                    | 9.2                                                               | 259                                             | 500                                                     | 11                                                           | .3                                                          | .00                                                           |
| JUNE<br>28... | 1400 | 98                                 | 14                                                      | 150                                                         | 65                                                                 | 36                                                    | 10                                                                | 287                                             | 480                                                     | 10                                                           | .3                                                          | .00                                                           |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(MG/L)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(MG/L)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(MG/L)<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(MG/L)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>04... | --                                                                  | .18                                                  | 160                                                 | 822                                                                            | 1.12                                                                    | 19.3                                                                  | 590                                            | 370                                                 | .7                                                           | 1180                                                                            | 7.9                      | 4.3                                    |
| APR.<br>25... | .040                                                                | .16                                                  | 170                                                 | 903                                                                            | 1.23                                                                    | 211                                                                   | 640                                            | 430                                                 | .7                                                           | 1220                                                                            | 7.9                      | 13.6                                   |
| JUNE<br>28... | .040                                                                | .28                                                  | 180                                                 | 907                                                                            | 1.23                                                                    | 240                                                                   | 640                                            | 410                                                 | .6                                                           | 1260                                                                            | 7.9                      | 24.6                                   |

## BIG SIOUX RIVER BASIN

99

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 1972 (partial-record station).

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>03... | 0840 | 18                                 | 28                                                      | 84                                                          | 39                                                                 | 15                                                    | 4.4                                                               | 321                                             | 130                                                     | 5.0                                                          | .3                                                          | .02                                                                      |
| APR.<br>06... | 1045 | 195                                | 17                                                      | 46                                                          | 23                                                                 | 7.7                                                   | 5.9                                                               | 216                                             | 59                                                      | 6.0                                                          | .3                                                          | .56                                                                      |
| JUNE<br>27... | 1155 | 190                                | 16                                                      | 50                                                          | 26                                                                 | 12                                                    | 6.2                                                               | 242                                             | 63                                                      | 3.3                                                          | .3                                                          | .17                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>03... | --                                                                  | .14                                                  | 90                                                  | 464                                                                            | .63                                                           | 23.1                                                        | 370                                           | 110                                                          | .3                                                 | 714                                                                   | 7.8                      | .3                                     |
| APR.<br>06... | .080                                                                | .17                                                  | 120                                                 | 274                                                                            | .37                                                           | 144                                                         | 210                                           | 32                                                           | .2                                                 | 427                                                                   | 7.9                      | 5.8                                    |
| JUNE<br>27... | .11                                                                 | .17                                                  | 80                                                  | 297                                                                            | .40                                                           | 152                                                         | 230                                           | 33                                                           | .3                                                 | 481                                                                   | 8.0                      | 22.0                                   |

## 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 5.0 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 1972 (partial-record station).

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SD4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>02... | 1625 | 10                                 | 15                                                      | 89                                                          | 34                                                                 | 8.1                                                   | 6.8                                                               | 240                                             | 180                                                     | 4.9                                                          | .3                                                          | .06                                                                      |
| APR.<br>06... | 1135 | 42                                 | 15                                                      | 72                                                          | 29                                                                 | 7.5                                                   | 4.8                                                               | 233                                             | 120                                                     | 3.9                                                          | .2                                                          | .03                                                                      |
| JUNE<br>27... | 1245 | 30                                 | 21                                                      | 89                                                          | 41                                                                 | 8.9                                                   | 5.6                                                               | 330                                             | 130                                                     | 4.9                                                          | .3                                                          | .55                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>(SUM OF<br>CONSTITUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(03400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>02... | --                                                                  | .17                                                  | 80                                                  | 457                                                             | .62                                                           | 13.2                                                        | 360                                           | 170                                                          | .2                                                 | 697                                                                   | 7.8                      | 4.2                                    |
| APR.<br>06... | .010                                                                | .12                                                  | 70                                                  | 367                                                             | .50                                                           | 41.6                                                        | 300                                           | 110                                                          | .2                                                 | 564                                                                   | 7.9                      | 7.0                                    |
| JUNE<br>27... | .060                                                                | .16                                                  | 100                                                 | 466                                                             | .63                                                           | 37.7                                                        | 390                                           | 120                                                          | .2                                                 | 731                                                                   | 7.9                      | 23.6                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PEN-<br>DED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(MG/L)<br>(80154) | SUS-<br>PEN-<br>DED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------|
| OCT.<br>04... | 1620 | 13.0                                   | .01                                                      | 134                                                                         | .00                                                                          |
| APR.<br>05... | 1750 | 8.0                                    | 41                                                       | 50                                                                          | 5.5                                                                          |
| MAY<br>03...  | 0735 | 7.0                                    | 131                                                      | 120                                                                         | 42                                                                           |
| JUNE<br>06... | 1650 | 25.0                                   | 84                                                       | 101                                                                         | 23                                                                           |
| JULY<br>11... | 1605 | 27.0                                   | 20                                                       | 129                                                                         | 7.0                                                                          |
| AUG.<br>01... | 1635 | 23.0                                   | 2.0                                                      | 121                                                                         | 6.5                                                                          |
| SEP.<br>12... | 1525 | 17.5                                   | 3.7                                                      | 107                                                                         | 1.1                                                                          |

## BIG SIOUX RIVER BASIN

101

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 highway 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 1972 (partial-record station).  
Sediment records: October 1970 to September 1972 (partial-record station).

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SIO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>02... | 1505 | .70                                | 5.7                                                     | 130                                                         | 66                                                                 | 38                                                    | 6.5                                                               | 207                                             | 520                                                     | 7.4                                                          | .3                                                          | .15                                                                      |
| APR.<br>06... | 1230 | 5.2                                | 11                                                      | 96                                                          | 35                                                                 | 9.6                                                   | 5.5                                                               | 236                                             | 200                                                     | 6.0                                                          | .3                                                          | .85                                                                      |
| JUNE<br>27... | 1505 | 8.8                                | 14                                                      | 110                                                         | 49                                                                 | 14                                                    | 5.6                                                               | 255                                             | 300                                                     | 7.9                                                          | .3                                                          | .20                                                                      |

NOTE.--Carbonate (CO3) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>02... | --                                                                  | .12                                                  | 340                                                 | 877                                                                            | 1.19                                                          | 1.66                                                        | 600                                           | 430                                                          | .7                                                 | 1200                                                                  | 7.8                      | 6.0                                    |
| APR.<br>06... | .040                                                                | .13                                                  | 90                                                  | 483                                                                            | .66                                                           | 6.78                                                        | 380                                           | 190                                                          | .2                                                 | 732                                                                   | 8.1                      | 7.7                                    |
| JUNE<br>27... | .070                                                                | .11                                                  | 130                                                 | 627                                                                            | .85                                                           | 14.9                                                        | 480                                           | 270                                                          | .3                                                 | 920                                                                   | 7.9                      | 24.0                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PEN-<br>DED<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PEN-<br>DED<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------|
| OCT.<br>04... | 1400 | 17.0                                   | .03                                                      | 42                                                        | .00                                                                          |
| APR.<br>06... | 1115 | 6.5                                    | 5.3                                                      | 59                                                        | .84                                                                          |
| MAY<br>02...  | 1630 | 8.0                                    | 142                                                      | 144                                                       | 55                                                                           |
| JUNE<br>06... | 1430 | 24.0                                   | 22                                                       | 719                                                       | 43                                                                           |
| JULY<br>10... | 1500 | 27.5                                   | 14                                                       | 111                                                       | 4.2                                                                          |
| AUG.<br>01... | 1335 | 22.0                                   | 28                                                       | 137                                                       | 10                                                                           |
| SEP.<br>12... | 1345 | 17.5                                   | 4.6                                                      | 82                                                        | 1.0                                                                          |

## 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 1972 (partial-record station).  
Sediment records: October 1970 to September 1972 (partial-record station).

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(S04)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>02... | 1210 | 8.1                                | 13                                                      | 99                                                          | 40                                                                 | 22                                                    | 4.0                                                               | 276                                             | 230                                                     | 6.9                                                          | .3                                                          | .11                                                                      |
| APR.<br>06... | 1325 | 46                                 | 12                                                      | 73                                                          | 29                                                                 | 9.6                                                   | 5.4                                                               | 231                                             | 130                                                     | 8.3                                                          | .3                                                          | .05                                                                      |
| JUNE<br>27... | 1555 | 37                                 | 13                                                      | 93                                                          | 41                                                                 | 15                                                    | 5.2                                                               | 312                                             | 180                                                     | 8.3                                                          | .3                                                          | .27                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | TIME | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(MG/L)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(MG/L)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>02... | --   | .11                                                                 | .11                                                  | 120                                                 | 552                                                                            | .75                                                                     | 12.1                                                                  | 410                                            | 190                                                          | .5                                                 | 816                                                                   | 8.0                      | 3.6                                    |
| APR.<br>06... | .020 | .10                                                                 | .10                                                  | 90                                                  | 382                                                                            | .52                                                                     | 47.4                                                                  | 300                                            | 110                                                          | .2                                                 | 591                                                                   | 7.9                      | 8.0                                    |
| JUNE<br>27... | .020 | .14                                                                 | .14                                                  | 110                                                 | 511                                                                            | .70                                                                     | 51.0                                                                  | 400                                            | 150                                                          | .3                                                 | 796                                                                   | 7.9                      | 22.4                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------|
| OCT.<br>04... | 1310 | 13.0                                   | .21                                                      | 100                                                 | .06                                                                    |
| APR.<br>06... | 1310 | 8.0                                    | 46                                                       | 72                                                  | 8.9                                                                    |
| MAY<br>02...  | 1530 | 8.0                                    | 390                                                      | 232                                                 | 244                                                                    |
| JUNE<br>06... | 1105 | 23.0                                   | 152                                                      | 96                                                  | 39                                                                     |
| JULY<br>10... | 1215 | 25.0                                   | 35                                                       | 136                                                 | 13                                                                     |
| AUG.<br>01... | 1110 | 20.0                                   | 380                                                      | 337                                                 | 346                                                                    |
| SEP.<br>12... | 1205 | 16.0                                   | 3.9                                                      | 109                                                 | 1.1                                                                    |

## BIG SIOUX RIVER BASIN

103

06479910 SIXMILE CREEK NEAR BROOKINGS, S. DAK.

LOCATION.--Lat 44°20'46", long 96°44'51", in NE¼SE¼ sec.7, T.110 N., R.49 W., Brookings County, at gaging station, on left bank 8.0 ft downstream from highway 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 1972 (partial-record station).  
Sediment records: October 1970 to September 1972 (partial-record station).

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

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(STO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLU-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>03... | 1105 | 1.7                                | 24                                                      | 140                                                         | 53                                                                 | 26                                                    | 5.3                                                               | 309                                             | 330                                                     | 6.7                                                          | .4                                                          | .72                                                                      |
| APR.<br>06... | 1425 | 4.7                                | 9.4                                                     | 97                                                          | 40                                                                 | 18                                                    | 4.1                                                               | 246                                             | 210                                                     | 8.4                                                          | .3                                                          | .25                                                                      |
| JUNE<br>27... | 1825 | 11                                 | 17                                                      | 100                                                         | 40                                                                 | 14                                                    | 4.2                                                               | 295                                             | 210                                                     | 6.6                                                          | .3                                                          | .44                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis of all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(01020) | DIS-<br>SOLVED<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(03400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|-----------------------------------------------------------|--------------------------------------------|-------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>03... | --                                                        | .10                                        | 170                                       | 741                                                                  | 1.01                                                          | 3.50                                                        | 570                                           | 310                                                          | .5                                                 | 1080                                                                  | 7.4                      | 2.3                                    |
| APR.<br>06... | .020                                                      | .060                                       | 120                                       | 509                                                                  | .69                                                           | 6.46                                                        | 410                                           | 210                                                          | .4                                                 | 761                                                                   | 8.1                      | 12.1                                   |
| JUNE<br>27... | .020                                                      | .090                                       | 120                                       | 539                                                                  | .73                                                           | 16.0                                                        | 410                                           | 170                                                          | .3                                                 | 817                                                                   | 8.0                      | 23.6                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------|----------------------------------------------------------------|
| OCT.<br>05... | 0915 | 11.0                                   | .23                                                      | 53                                                  | .03                                                            |
| APR.<br>06... | 1220 | 7.0                                    | 4.7                                                      | 50                                                  | .63                                                            |
| MAY<br>02...  | 1230 | 8.0                                    | 234                                                      | 126                                                 | 80                                                             |
| JUNE<br>06... | 1100 | 24.0                                   | 14                                                       | 57                                                  | 2.2                                                            |
| AUG.<br>02... | 0910 | 19.0                                   | 9.6                                                      | 79                                                  | 2.0                                                            |
| SEP.<br>12... | 1045 | 18.0                                   | 1.1                                                      | 94                                                  | .28                                                            |



## 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 3.0 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 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>18... | 1445 | 92                                 | 14                                                      | 79                                                          | 35                                                                 | 30                                                    | 5.4                                                               | 245                                             | 160                                                     | 33                                                           | .4                                                          | .57                                                                      |
| APR.<br>28... | 1545 | 569                                | 11                                                      | 82                                                          | 39                                                                 | 16                                                    | 5.7                                                               | 285                                             | 150                                                     | 12                                                           | .3                                                          | .04                                                                      |
| MAY<br>31...  | 1430 | 4450                               | 21                                                      | 72                                                          | 32                                                                 | 14                                                    | 6.0                                                               | 255                                             | 130                                                     | 8.9                                                          | .4                                                          | .02                                                                      |
| JUNE<br>28... | 0745 | 734                                | 17                                                      | 77                                                          | 43                                                                 | 27                                                    | 9.3                                                               | 293                                             | 180                                                     | 14                                                           | .2                                                          | .38                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(02400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>18... | --                                                                  | .36                                                  | 100                                                 | 481                                                                 | .65                                                           | 120                                                         | 340                                           | 140                                                          | .7                                                 | 768                                                                   | 7.8                      | 2.2                                    |
| APR.<br>28... | --                                                                  | .19                                                  | 90                                                  | 457                                                                 | .62                                                           | 702                                                         | 370                                           | 130                                                          | .4                                                 | 731                                                                   | 7.9                      | 8.6                                    |
| MAY<br>31...  | .16                                                                 | .26                                                  | 130                                                 | 410                                                                 | .56                                                           | 4930                                                        | 310                                           | 100                                                          | .3                                                 | 645                                                                   | 7.4                      | --                                     |
| JUNE<br>28... | .14                                                                 | .32                                                  | 150                                                 | 514                                                                 | .70                                                           | 1020                                                        | 370                                           | 130                                                          | .6                                                 | 799                                                                   | 7.8                      | 20.9                                   |

## BIG SIOUX RIVER BASIN

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

PERIOD OF RECORD.--Chemical analyses: July 1967 to September 1969, October 1969 to September 1972 (partial-record station).

Sediment records: October 1970 to September 1972 (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 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(000060) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|---------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| NOV.<br>18... | 1445 | 92                                                            | 100                                                 | 20                                                            | 310                                                    | 0                                                           | --                                                           | 0                                                     | --                                                    |
| APR.<br>28... | 1545 | 569                                                           | 100                                                 | 30                                                            | 0                                                      | 5                                                           | 1                                                            | --                                                    | 1                                                     |
|               |      |                                                               |                                                     |                                                               |                                                        |                                                             |                                                              |                                                       | 2                                                     |

| DATE          | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>SILVER<br>(AG)<br>(UG/L)<br>(01075) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) |
|---------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|
| NOV.<br>18... | --                                                  | 29                                                     | .5                                            | 0                                                              | --                                                    | 2                                                            | --                                                    | 280                                                           | 1.0                                                         |
| APR.<br>28... | 2                                                   | 20                                                     | .1                                            | 0                                                              | 5                                                     | 3                                                            | 1                                                     | 290                                                           | 1.2                                                         |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------|
| OCT.<br>05... | 1100 | 13.0                                   | 12                                                       | 88                                                  | 2.9                                                                    |
| APR.<br>06... | 1100 | 7.0                                    | 391                                                      | 85                                                  | 90                                                                     |
| MAY<br>03...  | 1715 | 8.0                                    | 1950                                                     | 75                                                  | 395                                                                    |
| JULY<br>12... | 1500 | 25.0                                   | 513                                                      | 180                                                 | 249                                                                    |
| AUG.<br>02... | 1200 | 20.0                                   | 780                                                      | 177                                                 | 373                                                                    |
| SEP.<br>13... | 1145 | 18.0                                   | 234                                                      | 153                                                 | 97                                                                     |

## 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 1972.

Water temperatures: October 1967 to September 1972.

Sediment records: October 1967 to September 1972.

EXTREMES.--1971-72:

Dissolved solids: Maximum, 876 mg/l Feb. 1-29; minimum, 172 mg/l Mar. 12-23.

Hardness: Maximum, 650 mg/l Feb. 1-29; minimum, 120 mg/l Mar. 12-23.

Sediment concentrations: Maximum daily, 425 mg/l May 25; minimum daily, 20 mg/l Mar. 8.

Sediment discharge: Maximum daily, 1,730 tons May 25; minimum daily, 1.0 tons Mar. 8.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE                | TIME | MEAN<br>DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------------|------|--------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| OCT.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 28                                         | 9.4                                                     | 80                                                          | 42                                                                 | 39                                                    | 7.4                                                               | 257                                             | 210                                                     | 32                                                           | .3                                                          | 1.3                                                                      |
| NOV.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 76                                         | 13                                                      | 85                                                          | 40                                                                 | 29                                                    | 8.3                                                               | 262                                             | 190                                                     | 30                                                           | .3                                                          | 1.2                                                                      |
| DEC.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 58                                         | 20                                                      | 120                                                         | 48                                                                 | 39                                                    | 6.6                                                               | 296                                             | 260                                                     | 29                                                           | .3                                                          | 1.8                                                                      |
| JAN.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 24                                         | 24                                                      | 130                                                         | 54                                                                 | 39                                                    | 5.8                                                               | 414                                             | 240                                                     | 30                                                           | .4                                                          | 2.4                                                                      |
| FEB.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-29               | --   | 13                                         | 27                                                      | 160                                                         | 60                                                                 | 50                                                    | 6.9                                                               | 451                                             | 290                                                     | 42                                                           | .5                                                          | 3.7                                                                      |
| MAR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-11               | --   | 18                                         | 22                                                      | 110                                                         | 49                                                                 | 56                                                    | 6.3                                                               | 296                                             | 260                                                     | 57                                                           | .5                                                          | 3.3                                                                      |
| 12-23               | --   | 1480                                       | 10                                                      | 33                                                          | 9.5                                                                | 4.6                                                   | 7.4                                                               | 103                                             | 39                                                      | 4.8                                                          | .3                                                          | 2.7                                                                      |
| 24-31               | --   | 827                                        | 15                                                      | 60                                                          | 21                                                                 | 11                                                    | 6.4                                                               | 177                                             | 93                                                      | 8.3                                                          | .4                                                          | 2.4                                                                      |
| APR.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 593                                        | 16                                                      | 73                                                          | 30                                                                 | 15                                                    | 6.0                                                               | 234                                             | 130                                                     | 11                                                           | .4                                                          | 1.1                                                                      |
| MAY                 |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 1600                                       | 15                                                      | 89                                                          | 38                                                                 | 17                                                    | 6.7                                                               | 267                                             | 180                                                     | 9.8                                                          | .4                                                          | .49                                                                      |
| JUNE                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 1600                                       | 20                                                      | 82                                                          | 37                                                                 | 16                                                    | 7.3                                                               | 288                                             | 140                                                     | 8.4                                                          | .4                                                          | .49                                                                      |
| JULY                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 795                                        | 19                                                      | 75                                                          | 41                                                                 | 21                                                    | 9.7                                                               | 267                                             | 180                                                     | 13                                                           | .4                                                          | .98                                                                      |
| AUG.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-31               | --   | 542                                        | 23                                                      | 80                                                          | 43                                                                 | 23                                                    | 9.3                                                               | 289                                             | 160                                                     | 12                                                           | .4                                                          | 1.0                                                                      |
| SEP.                |      |                                            |                                                         |                                                             |                                                                    |                                                       |                                                                   |                                                 |                                                         |                                                              |                                                             |                                                                          |
| 01-30               | --   | 231                                        | 18                                                      | 78                                                          | 47                                                                 | 31                                                    | 11                                                                | 281                                             | 210                                                     | 20                                                           | .4                                                          | 1.1                                                                      |
| WTD. AVG.           | --   | --                                         | 17                                                      | 77                                                          | 35                                                                 | 17                                                    | 7.6                                                               | 255                                             | 151                                                     | 11                                                           | .4                                                          | .98                                                                      |
| TIME WTD.           | --   | 531                                        | 18                                                      | 93                                                          | 42                                                                 | 29                                                    | 7.6                                                               | 291                                             | 193                                                     | 22                                                           | .4                                                          | 1.5                                                                      |
| TOT. LOAD<br>(TONS) | --   | --                                         | 9050                                                    | 40600                                                       | 18500                                                              | 9130                                                  | 4000                                                              | 134000                                          | 79000                                                   | 5630                                                         | 204                                                         | 515                                                                      |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |       |    |    |    |    |     |     |     |     |    |     |
|-------|------|-------|----|----|----|----|-----|-----|-----|-----|----|-----|
| MAY   |      |       |    |    |    |    |     |     |     |     |    |     |
| 31... | 1600 | A3170 | 20 | 73 | 30 | 12 | 6.8 | 232 | 130 | 6.3 | .4 | .62 |
| AUG.  |      |       |    |    |    |    |     |     |     |     |    |     |
| 24... | 1430 | A368  | 20 | 78 | 47 | 32 | 11  | 286 | 200 | 17  | .4 | .34 |
| SEP.  |      |       |    |    |    |    |     |     |     |     |    |     |
| 27... | 1220 | A90   | 11 | 68 | 46 | 33 | 9.0 | 271 | 190 | 21  | .3 | .30 |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

A Discharge at time of sampling.

## BIG SIOUX RIVER BASIN

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

## EXTREMES.--Continued

## Period of record:

Dissolved solids (1967-68, 1970-72): Maximum, 876 mg/l Feb. 1-29, 1972; minimum, 172 mg/l Mar. 12-23, 1972.

Hardness (1967-68, 1970-72): Maximum, 650 mg/l Feb. 1-29, 1972; minimum, 120 mg/l Mar. 12-23, 1972.

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

Water temperatures (1967-71): Maximum, 31.0°C June 26, 1971; minimum, freezing point on many days during winter period.

Sediment concentrations (1968-72): 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.--Sediment records good. Daily samples for chemical analysis composited by discharge. Maximum observed during water year: Specific conductance, daily, 1,750 micromhos Feb. 22; water temperatures, 31.0°C Aug. 19, 20. Minimum observed during water year: Specific conductance, daily, 220 micromhos Mar. 16; water temperatures, freezing point on many days during December to March. Flow affected by ice Dec. 2 to Mar. 19. Miscellaneous samples of chemical data published for water years 1960-62, 1967. Additional samples collected for more comprehensive definition of water quality.

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1973

| DATE                | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TJENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS)<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS)<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA, MG)<br>(00700) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------------|-----------------------------------------------------------|--------------------------------------------|-------------------------------------------|--------------------------------------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------------|--------------------------|----------------------------------------|
| OCT.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-31               | --                                                        | .29                                        | 150                                       | 553                                                                            | .75                                                            | 41.8                                                         | 370                                  | 160                                                          | .9                                                 | 855                                                                  | 8.1                      | --                                     |
| NOV.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-30               | --                                                        | --                                         | 110                                       | 530                                                                            | .72                                                            | 109                                                          | 380                                  | 160                                                          | .7                                                 | 822                                                                  | 7.9                      | --                                     |
| DEC.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-31               | .26                                                       | .34                                        | 50                                        | 677                                                                            | .92                                                            | 106                                                          | 500                                  | 250                                                          | .8                                                 | 1030                                                                 | 8.1                      | --                                     |
| JAN.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-31               | .36                                                       | .38                                        | 140                                       | 738                                                                            | 1.00                                                           | 47.8                                                         | 550                                  | 210                                                          | .7                                                 | 1110                                                                 | 7.5                      | --                                     |
| FEB.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-29               | .46                                                       | .62                                        | 170                                       | 876                                                                            | 1.19                                                           | 30.7                                                         | 650                                  | 280                                                          | .9                                                 | 1270                                                                 | 8.2                      | --                                     |
| MAR.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-11               | .28                                                       | .26                                        | 140                                       | 722                                                                            | .98                                                            | 35.1                                                         | 480                                  | 230                                                          | 1.1                                                | 1080                                                                 | 8.0                      | --                                     |
| 12-23               | .39                                                       | .35                                        | 50                                        | 172                                                                            | .23                                                            | 687                                                          | 120                                  | 37                                                           | .2                                                 | 280                                                                  | 7.7                      | --                                     |
| 24-31               | .22                                                       | .19                                        | 60                                        | 313                                                                            | .43                                                            | 699                                                          | 240                                  | 91                                                           | .3                                                 | 505                                                                  | 7.8                      | --                                     |
| APR.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-30               | .17                                                       | .15                                        | 70                                        | 402                                                                            | .55                                                            | 644                                                          | 310                                  | 110                                                          | .4                                                 | 629                                                                  | 8.0                      | --                                     |
| MAY                 |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-31               | .16                                                       | .11                                        | 90                                        | 490                                                                            | .67                                                            | 2120                                                         | 380                                  | 160                                                          | .4                                                 | 751                                                                  | 8.0                      | --                                     |
| JUNE                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-30               | .23                                                       | .23                                        | 120                                       | 456                                                                            | .62                                                            | 1970                                                         | 360                                  | 120                                                          | .4                                                 | 717                                                                  | 8.0                      | --                                     |
| JULY                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-31               | .22                                                       | .22                                        | 140                                       | 495                                                                            | .67                                                            | 1060                                                         | 360                                  | 140                                                          | .5                                                 | 764                                                                  | 8.1                      | --                                     |
| AUG.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-31               | .22                                                       | .23                                        | 170                                       | 498                                                                            | .68                                                            | 729                                                          | 380                                  | 140                                                          | .5                                                 | 777                                                                  | 7.9                      | --                                     |
| SEP.                |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| 01-30               | .15                                                       | .16                                        | 220                                       | 559                                                                            | .76                                                            | 349                                                          | 390                                  | 160                                                          | .7                                                 | 810                                                                  | 8.2                      | --                                     |
| WTD. AVG.           | B.21                                                      | C.20                                       | 109                                       | 447                                                                            | .61                                                            | --                                                           | 340                                  | 129                                                          | .4                                                 | 693                                                                  | 8.0                      | --                                     |
| TIME WTD.           |                                                           |                                            |                                           |                                                                                |                                                                |                                                              |                                      |                                                              |                                                    |                                                                      |                          |                                        |
| AVG.                | B.25                                                      | C.27                                       | 126                                       | 555                                                                            | .76                                                            | --                                                           | 408                                  | 167                                                          | .6                                                 | 845                                                                  | 8.0                      | --                                     |
| TOT. LOAD<br>(TONS) | B112                                                      | C104                                       | 57                                        | 234000                                                                         | --                                                             | --                                                           | --                                   | --                                                           | --                                                 | --                                                                   | --                       | --                                     |

## ANALYSES OF ADDITIONAL SAMPLES

|       |      |     |     |     |     |      |     |     |    |     |     |      |
|-------|------|-----|-----|-----|-----|------|-----|-----|----|-----|-----|------|
| MAY   |      |     |     |     |     |      |     |     |    |     |     |      |
| 31... | .23  | .43 | 100 | 396 | .54 | 3390 | 310 | 120 | .3 | 612 | 7.9 | 18.9 |
| AUG.  |      |     |     |     |     |      |     |     |    |     |     |      |
| 24... | --   | .33 | --  | 548 | .81 | 54.4 | 390 | 150 | .7 | 834 | 8.1 | 20.2 |
| SEP.  |      |     |     |     |     |      |     |     |    |     |     |      |
| 27... | .050 | .21 | --  | 513 | .87 | 26.3 | 360 | 140 | .8 | 812 | 7.8 | 12.6 |

B Based on 305 days of chemical analysis.

C Based on 336 days of chemical analysis.

## BIG SIOUX RIVER BASIN

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

SPECIFIC CONDUCTANCE (MICROMHOS AT 25°C), WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT | NOV  | DEC  | JAN  | FEB  | MAR  | APR | MAY | JUN  | JUL  | AUG  | SEP  |
|-----|-----|------|------|------|------|------|-----|-----|------|------|------|------|
| 1   | 805 | 760  | 950  | ---  | 1160 | ---  | 540 | --- | 620  | ---  | ---  | 850  |
| 2   | 847 | 730  | 980  | ---  | ---  | 1250 | --- | --- | 620  | 780  | 680  | ---  |
| 3   | 860 | 780  | 950  | ---  | ---  | 1100 | 560 | --- | 580  | 796  | 660  | ---  |
| 4   | 844 | 780  | 960  | ---  | ---  | 1070 | --- | --- | ---  | 792  | 690  | 860  |
| 5   | 844 | ---  | ---  | ---  | ---  | 1260 | --- | --- | 640  | 792  | 690  | 860  |
| 6   | 829 | ---  | ---  | ---  | ---  | 900  | 570 | --- | 680  | 754  | 610  | 860  |
| 7   | 847 | ---  | ---  | ---  | ---  | 900  | 570 | 675 | 710  | 780  | 690  | 850  |
| 8   | --- | 775  | ---  | ---  | ---  | 980  | 580 | 680 | 730  | 780  | 720  | 830  |
| 9   | 867 | 795  | 1020 | ---  | ---  | 1060 | 585 | 700 | 750  | 785  | 730  | 840  |
| 10  | --- | 785  | 1010 | 1060 | ---  | 970  | 585 | 710 | 760  | 785  | 760  | 850  |
| 11  | --- | 750  | 1040 | 1060 | 1180 | ---  | 600 | --- | ---  | 795  | 750  | 860  |
| 12  | --- | 750  | 1080 | 1040 | 1160 | ---  | 600 | --- | 760  | 770  | 740  | 840  |
| 13  | 918 | 770  | 1100 | ---  | 1150 | 245  | --- | 710 | 760  | 755  | 740  | 840  |
| 14  | 918 | 785  | 1100 | ---  | 1170 | 230  | 660 | 750 | 770  | 718  | 740  | 840  |
| 15  | 936 | 775  | 1110 | ---  | 1120 | 240  | 630 | 750 | 750  | 663  | 740  | 840  |
| 16  | 941 | 785  | 1110 | ---  | 1180 | 220  | 645 | 780 | 785  | 730  | 750  | 800  |
| 17  | 946 | ---  | 1100 | 1070 | ---  | ---  | --- | 750 | ---  | 767  | 750  | ---  |
| 18  | --- | 815  | 1070 | 1040 | 1560 | 270  | 615 | 760 | ---  | 785  | 750  | 810  |
| 19  | --- | 790  | 1110 | ---  | 1460 | 285  | 600 | 810 | 800  | 792  | 750  | ---  |
| 20  | --- | 790  | 1100 | 1120 | ---  | 285  | 650 | 830 | 790  | 787  | 760  | 840  |
| 21  | 934 | 775  | 1110 | 1120 | ---  | 300  | 635 | 810 | 780  | ---  | 760  | 840  |
| 22  | --- | 770  | 1080 | 1100 | 1750 | 320  | 630 | 780 | 670  | 550  | 760  | ---  |
| 23  | 922 | 790  | ---  | ---  | ---  | 365  | 635 | 750 | 625  | 674  | 750  | 840  |
| 24  | 918 | 790  | ---  | ---  | 1150 | 510  | 650 | 750 | 660  | 725  | 750  | 850  |
| 25  | 918 | 790  | ---  | ---  | 1140 | 470  | 680 | 680 | 690  | 718  | 740  | ---  |
| 26  | 918 | 810  | ---  | ---  | 1150 | ---  | 700 | 710 | 730  | 655  | 730  | 830  |
| 27  | 872 | 820  | ---  | ---  | 1140 | 490  | --- | 710 | 750  | 671  | 740  | 830  |
| 28  | 890 | 810  | ---  | ---  | 1330 | 530  | 700 | 690 | 750  | 700  | 760  | 850  |
| 29  | --- | 900  | ---  | 1120 | 1240 | 500  | 710 | 670 | 790  | 718  | 760  | 850  |
| 30  | 791 | 890  | ---  | 1140 | ---  | 520  | --- | 635 | ---  | 697  | ---  | 820  |
| 31  | 797 | ---  | ---  | 1150 | ---  | 550  | --- | 590 | ---  | 723  | ---  | ---  |
| AVG | --- | F791 | ---  | ---  | ---  | F608 | --- | --- | E718 | J739 | H730 | D841 |

TEMPERATURE (°C) OF WATER, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY | OCT  | NOV  | DEC | JAN | FEB | MAR  | APR   | MAY  | JUN   | JUL   | AUG   | SEP   |
|-----|------|------|-----|-----|-----|------|-------|------|-------|-------|-------|-------|
| 1   | 22.0 | 10.0 | 0.0 | --- | 0.0 | 0.0  | 5.5   | ---  | 22.0  | ---   | ---   | 20.0  |
| 2   | 19.0 | 9.0  | 0.0 | --- | --- | 0.0  | ---   | ---  | 23.5  | 22.0  | 23.5  | ---   |
| 3   | 15.5 | 6.5  | 0.0 | --- | --- | 1.0  | 5.5   | ---  | 25.5  | 22.0  | 23.5  | ---   |
| 4   | 19.0 | 10.0 | 0.0 | --- | --- | 0.0  | ---   | ---  | ---   | 21.0  | 23.5  | 20.0  |
| 5   | 18.0 | ---  | --- | --- | --- | 1.0  | ---   | ---  | 26.0  | 21.0  | 22.0  | 22.0  |
| 6   | 19.0 | ---  | --- | --- | --- | 3.5  | 9.0   | ---  | 26.0  | 22.0  | 21.0  | 23.5  |
| 7   | 19.0 | 0.0  | --- | --- | --- | 1.0  | 8.0   | 14.5 | 23.5  | 24.5  | 21.0  | 21.0  |
| 8   | ---  | 1.0  | --- | --- | --- | 1.0  | 6.5   | 13.5 | 25.5  | 24.5  | 19.0  | 21.0  |
| 9   | 15.5 | 9.0  | 0.0 | --- | --- | 1.0  | 8.0   | 14.5 | 25.5  | 25.5  | 19.0  | 20.0  |
| 10  | ---  | 10.5 | 0.5 | 0.0 | --- | 2.0  | 14.5  | 15.5 | 23.5  | 26.5  | 22.0  | 20.5  |
| 11  | ---  | 11.0 | 0.5 | 0.0 | 0.0 | ---  | 11.0  | ---  | ---   | 26.5  | 26.5  | 21.0  |
| 12  | ---  | 11.0 | 0.5 | 0.0 | 0.0 | ---  | 12.0  | ---  | 25.5  | 25.5  | 26.5  | 21.0  |
| 13  | 15.5 | 10.5 | 1.0 | --- | 0.0 | 4.5  | 10.0  | 15.5 | 23.5  | 25.5  | 29.0  | 20.0  |
| 14  | 16.0 | 10.0 | 1.0 | --- | 0.0 | 4.5  | 10.0  | 16.0 | 24.5  | 24.5  | 28.0  | 21.0  |
| 15  | 14.5 | 11.0 | 0.5 | --- | 0.0 | 6.5  | 12.0  | 19.0 | 24.5  | 25.5  | 29.0  | 22.0  |
| 16  | 16.5 | 10.0 | 0.0 | --- | 0.0 | 6.5  | 13.5  | 21.0 | 21.0  | 24.5  | 30.0  | 22.0  |
| 17  | 18.0 | ---  | 0.0 | --- | --- | ---  | ---   | 22.0 | ---   | 23.5  | 30.0  | ---   |
| 18  | ---  | 8.0  | 0.0 | 0.0 | 0.0 | 3.5  | 12.0  | 23.5 | ---   | 24.5  | 29.0  | 23.5  |
| 19  | ---  | 4.5  | 0.0 | --- | 0.0 | 9.0  | 10.0  | 25.5 | 22.0  | 24.5  | 31.0  | ---   |
| 20  | ---  | 5.5  | 1.0 | 0.0 | --- | 5.5  | 13.5  | 25.5 | 19.0  | 22.0  | 31.0  | 20.0  |
| 21  | 16.5 | 3.5  | 1.0 | 0.0 | --- | 5.5  | 9.0   | 25.5 | 20.0  | ---   | 26.5  | 19.0  |
| 22  | ---  | 2.0  | 2.0 | --- | 0.0 | 6.5  | 10.0  | 24.5 | 23.5  | 26.5  | 21.0  | ---   |
| 23  | 15.5 | 5.5  | --- | 0.0 | 0.0 | 8.0  | 12.0  | 21.0 | 21.0  | 28.0  | 22.0  | 18.0  |
| 24  | 16.5 | 5.5  | --- | --- | 0.0 | 4.5  | 11.0  | 20.0 | 20.0  | 29.0  | 21.0  | 18.0  |
| 25  | 15.0 | 3.5  | --- | --- | 0.0 | 4.5  | 14.5  | 22.0 | 23.5  | 24.5  | 21.0  | ---   |
| 26  | 18.5 | 1.0  | --- | --- | --- | ---  | 13.5  | 22.0 | 24.5  | 25.5  | 22.0  | 15.5  |
| 27  | 12.0 | 1.0  | --- | --- | --- | 5.5  | ---   | 21.0 | 23.5  | 24.5  | 24.0  | 14.5  |
| 28  | 1.0  | 1.0  | --- | --- | --- | 4.5  | 11.0  | 21.5 | 22.0  | 25.5  | 26.5  | 14.5  |
| 29  | ---  | 2.0  | --- | 0.0 | --- | 5.5  | 11.0  | 19.0 | 25.5  | 25.5  | 25.5  | 13.5  |
| 30  | 1.0  | 2.0  | --- | 0.0 | --- | 6.5  | ---   | 19.0 | ---   | 28.0  | ---   | 18.0  |
| 31  | 5.5  | ---  | --- | 0.0 | --- | 4.5  | ---   | 19.0 | ---   | 25.5  | ---   | ---   |
| AVG | ---  | G6.0 | --- | --- | --- | G4.0 | D10.5 | ---  | E23.5 | K25.0 | H25.0 | D19.5 |

D Based on 24 days of data.

E Based on 25 days of data.

F Based on 26 days of data.

G Based on 27 days of data.

H Based on 28 days of data.

J Based on 29 days of data.

K Based on 30 days of data.

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

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DAY   | OCTOBER                    |                                      |                                     | NOVEMBER                   |                                      |                                     | DECEMBER                   |                                      |                                     |
|-------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|----------------------------|--------------------------------------|-------------------------------------|
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 26                         | 94                                   | 6.6                                 | 66                         | 67                                   | 12                                  | 77                         | 49                                   | 10                                  |
| 2     | 31                         | 96                                   | 8.0                                 | 69                         | 63                                   | 12                                  | 76                         | 56                                   | 11                                  |
| 3     | 28                         | 100                                  | 7.6                                 | 69                         | 75                                   | 14                                  | 75                         | 59                                   | 12                                  |
| 4     | 27                         | 101                                  | 7.4                                 | 75                         | 80                                   | 16                                  | 74                         | 63                                   | 13                                  |
| 5     | 25                         | 102                                  | 6.9                                 | 66                         | 78                                   | 14                                  | 72                         | 62                                   | 12                                  |
| 6     | 23                         | 102                                  | 6.3                                 | 53                         | 76                                   | 11                                  | 71                         | 62                                   | 12                                  |
| 7     | 23                         | 104                                  | 6.5                                 | 53                         | 74                                   | 11                                  | 70                         | 62                                   | 12                                  |
| 8     | 22                         | 90                                   | 5.3                                 | 66                         | 71                                   | 13                                  | 68                         | 61                                   | 11                                  |
| 9     | 21                         | 80                                   | 4.5                                 | 60                         | 82                                   | 13                                  | 66                         | 61                                   | 11                                  |
| 10    | 19                         | 85                                   | 4.4                                 | 60                         | 82                                   | 13                                  | 65                         | 78                                   | 14                                  |
| 11    | 22                         | 90                                   | 5.3                                 | 58                         | 54                                   | 8.5                                 | 62                         | 75                                   | 13                                  |
| 12    | 21                         | 95                                   | 5.4                                 | 58                         | 53                                   | 8.3                                 | 60                         | 70                                   | 11                                  |
| 13    | 21                         | 98                                   | 5.6                                 | 61                         | 58                                   | 9.6                                 | 58                         | 82                                   | 13                                  |
| 14    | 22                         | 102                                  | 6.1                                 | 63                         | 56                                   | 9.5                                 | 55                         | 55                                   | 8.2                                 |
| 15    | 21                         | 108                                  | 6.1                                 | 63                         | 95                                   | 16                                  | 53                         | 50                                   | 7.2                                 |
| 16    | 21                         | 93                                   | 5.3                                 | 81                         | 105                                  | 23                                  | 51                         | 73                                   | 10                                  |
| 17    | 21                         | 120                                  | 6.8                                 | 87                         | 110                                  | 26                                  | 50                         | 54                                   | 7.3                                 |
| 18    | 25                         | 130                                  | 8.8                                 | 89                         | 74                                   | 18                                  | 49                         | 67                                   | 8.9                                 |
| 19    | 22                         | 120                                  | 7.1                                 | 89                         | 46                                   | 11                                  | 50                         | 58                                   | 7.8                                 |
| 20    | 22                         | 115                                  | 6.8                                 | 105                        | 73                                   | 21                                  | 52                         | 60                                   | 8.4                                 |
| 21    | 22                         | 111                                  | 6.6                                 | 109                        | 63                                   | 19                                  | 54                         | 60                                   | 8.7                                 |
| 22    | 22                         | 115                                  | 6.8                                 | 94                         | 65                                   | 16                                  | 55                         | 61                                   | 9.1                                 |
| 23    | 24                         | 121                                  | 7.8                                 | 73                         | 63                                   | 12                                  | 56                         | 60                                   | 9.1                                 |
| 24    | 29                         | 147                                  | 12                                  | 89                         | 66                                   | 16                                  | 56                         | 60                                   | 9.1                                 |
| 25    | 33                         | 145                                  | 13                                  | 87                         | 62                                   | 15                                  | 55                         | 60                                   | 8.9                                 |
| 26    | 33                         | 113                                  | 10                                  | 114                        | 39                                   | 12                                  | 54                         | 60                                   | 8.7                                 |
| 27    | 36                         | 132                                  | 13                                  | 85                         | 43                                   | 9.9                                 | 52                         | 60                                   | 8.4                                 |
| 28    | 44                         | 110                                  | 13                                  | 75                         | 69                                   | 14                                  | 48                         | 58                                   | 7.5                                 |
| 29    | 47                         | 90                                   | 11                                  | 79                         | 55                                   | 12                                  | 46                         | 58                                   | 7.2                                 |
| 30    | 56                         | 71                                   | 11                                  | 81                         | 65                                   | 14                                  | 43                         | 59                                   | 6.8                                 |
| 31    | 60                         | 64                                   | 10                                  | --                         | --                                   | --                                  | 39                         | 58                                   | 6.1                                 |
| TOTAL | 869                        | --                                   | 241.0                               | 2277                       | --                                   | 419.8                               | 1812                       | --                                   | 302.4                               |
| DAY   | JANUARY                    |                                      |                                     | FEBRUARY                   |                                      |                                     | MARCH                      |                                      |                                     |
|       | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) | MEAN<br>DISCHARGE<br>(CFS) | MEAN<br>CONCEN-<br>TRATION<br>(MG/L) | SEDIMENT<br>DISCHARGE<br>(TONS/DAY) |
| 1     | 37                         | 58                                   | 5.8                                 | 14                         | 40                                   | 1.5                                 | 16                         | 48                                   | 2.1                                 |
| 2     | 35                         | 58                                   | 5.5                                 | 14                         | 50                                   | 1.9                                 | 15                         | 50                                   | 2.0                                 |
| 3     | 33                         | 57                                   | 5.1                                 | 13                         | 58                                   | 2.0                                 | 14                         | 52                                   | 2.0                                 |
| 4     | 32                         | 56                                   | 4.8                                 | 12                         | 60                                   | 1.9                                 | 14                         | 50                                   | 1.9                                 |
| 5     | 31                         | 56                                   | 4.7                                 | 12                         | 61                                   | 2.0                                 | 14                         | 47                                   | 1.8                                 |
| 6     | 32                         | 57                                   | 4.9                                 | 11                         | 59                                   | 1.8                                 | 15                         | 33                                   | 1.3                                 |
| 7     | 34                         | 59                                   | 5.4                                 | 10                         | 64                                   | 1.7                                 | 17                         | 46                                   | 2.1                                 |
| 8     | 36                         | 58                                   | 5.6                                 | 9.0                        | 69                                   | 1.7                                 | 19                         | 20                                   | 1.0                                 |
| 9     | 39                         | 56                                   | 5.9                                 | 8.0                        | 66                                   | 1.4                                 | 21                         | 36                                   | 2.0                                 |
| 10    | 38                         | 54                                   | 5.5                                 | 8.5                        | 70                                   | 1.6                                 | 24                         | 50                                   | 3.2                                 |
| 11    | 36                         | 54                                   | 5.2                                 | 9.0                        | 75                                   | 1.8                                 | 26                         | 100                                  | 7.0                                 |
| 12    | 33                         | 55                                   | 4.9                                 | 9.5                        | 78                                   | 2.0                                 | 200                        | 150                                  | 81                                  |
| 13    | 30                         | 52                                   | 4.2                                 | 9.5                        | 79                                   | 2.0                                 | 600                        | 167                                  | 271                                 |
| 14    | 25                         | 49                                   | 3.3                                 | 10                         | 66                                   | 1.8                                 | 1100                       | 126                                  | 374                                 |
| 15    | 20                         | 48                                   | 2.6                                 | 10                         | 69                                   | 1.9                                 | 1400                       | 128                                  | 484                                 |
| 16    | 19                         | 52                                   | 2.7                                 | 11                         | 56                                   | 1.7                                 | 1750                       | 207                                  | 978                                 |
| 17    | 19                         | 51                                   | 2.6                                 | 12                         | 70                                   | 2.3                                 | 1850                       | 250                                  | 1250                                |
| 18    | 21                         | 47                                   | 2.7                                 | 12                         | 68                                   | 2.2                                 | 2100                       | 292                                  | 1660                                |
| 19    | 21                         | 46                                   | 2.6                                 | 13                         | 72                                   | 2.5                                 | 2000                       | 232                                  | 1250                                |
| 20    | 21                         | 50                                   | 2.8                                 | 14                         | 65                                   | 2.5                                 | 1980                       | 181                                  | 968                                 |
| 21    | 20                         | 50                                   | 2.7                                 | 14                         | 68                                   | 2.6                                 | 1850                       | 164                                  | 819                                 |
| 22    | 19                         | 48                                   | 2.5                                 | 15                         | 64                                   | 2.6                                 | 1610                       | 131                                  | 569                                 |
| 23    | 17                         | 46                                   | 2.1                                 | 16                         | 61                                   | 2.6                                 | 1290                       | 104                                  | 362                                 |
| 24    | 15                         | 49                                   | 2.0                                 | 16                         | 60                                   | 2.6                                 | 1030                       | 99                                   | 275                                 |
| 25    | 11                         | 47                                   | 1.4                                 | 16                         | 58                                   | 2.5                                 | 914                        | 92                                   | 227                                 |
| 26    | 10                         | 48                                   | 1.3                                 | 17                         | 53                                   | 2.4                                 | 916                        | 104                                  | 257                                 |
| 27    | 10                         | 45                                   | 1.2                                 | 17                         | 56                                   | 2.6                                 | 928                        | 115                                  | 288                                 |
| 28    | 14                         | 44                                   | 1.7                                 | 18                         | 54                                   | 2.6                                 | 831                        | 104                                  | 233                                 |
| 29    | 15                         | 45                                   | 1.8                                 | 17                         | 50                                   | 2.3                                 | 728                        | 74                                   | 145                                 |
| 30    | 15                         | 43                                   | 1.7                                 | --                         | --                                   | --                                  | 662                        | 77                                   | 138                                 |
| 31    | 14                         | 41                                   | 1.5                                 | --                         | --                                   | --                                  | 606                        | 111                                  | 182                                 |
| TOTAL | 752                        | --                                   | 106.7                               | 367.5                      | --                                   | 61.0                                | 24540                      | --                                   | 10837.4                             |

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

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| 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     | 566                  | 92                        | 141                           | 945                  | 190                       | 485                           | 3310                 | 132                       | 1180                          |
| 2     | 540                  | 100                       | 146                           | 1590                 | 250                       | 1070                          | 3330                 | 114                       | 1020                          |
| 3     | 524                  | 110                       | 156                           | 1830                 | 200                       | 988                           | 3630                 | 146                       | 1430                          |
| 4     | 507                  | 115                       | 157                           | 2130                 | 150                       | 863                           | 3510                 | 140                       | 1330                          |
| 5     | 488                  | 118                       | 155                           | 2240                 | 140                       | 847                           | 2980                 | 135                       | 1090                          |
| 6     | 480                  | 120                       | 156                           | 2240                 | 144                       | 871                           | 2470                 | 160                       | 1070                          |
| 7     | 473                  | 130                       | 166                           | 2160                 | 136                       | 793                           | 2150                 | 149                       | 865                           |
| 8     | 465                  | 101                       | 127                           | 1980                 | 141                       | 754                           | 1920                 | 179                       | 928                           |
| 9     | 468                  | 77                        | 97                            | 1750                 | 136                       | 643                           | 1700                 | 172                       | 789                           |
| 10    | 461                  | 119                       | 148                           | 1520                 | 122                       | 501                           | 1520                 | 180                       | 739                           |
| 11    | 455                  | 131                       | 161                           | 1340                 | 115                       | 416                           | 1370                 | 190                       | 703                           |
| 12    | 457                  | 101                       | 125                           | 1210                 | 100                       | 327                           | 1260                 | 206                       | 701                           |
| 13    | 467                  | 139                       | 175                           | 1230                 | 140                       | 465                           | 1160                 | 219                       | 686                           |
| 14    | 488                  | 122                       | 161                           | 1310                 | 130                       | 460                           | 1060                 | 220                       | 630                           |
| 15    | 522                  | 95                        | 134                           | 1320                 | 131                       | 467                           | 982                  | 226                       | 599                           |
| 16    | 595                  | 135                       | 217                           | 1340                 | 136                       | 492                           | 928                  | 220                       | 551                           |
| 17    | 746                  | 205                       | 413                           | 1300                 | 171                       | 600                           | 888                  | 210                       | 503                           |
| 18    | 837                  | 243                       | 549                           | 1250                 | 175                       | 591                           | 868                  | 205                       | 480                           |
| 19    | 816                  | 245                       | 540                           | 1200                 | 205                       | 664                           | 827                  | 201                       | 449                           |
| 20    | 729                  | 240                       | 472                           | 1120                 | 169                       | 511                           | 827                  | 228                       | 509                           |
| 21    | 683                  | 196                       | 361                           | 1020                 | 174                       | 479                           | 962                  | 272                       | 706                           |
| 22    | 653                  | 160                       | 282                           | 959                  | 245                       | 634                           | 1190                 | 217                       | 697                           |
| 23    | 643                  | 181                       | 314                           | 1080                 | 325                       | 948                           | 1360                 | 184                       | 676                           |
| 24    | 671                  | 172                       | 312                           | 1150                 | 159                       | 494                           | 1450                 | 172                       | 673                           |
| 25    | 690                  | 179                       | 333                           | 1510                 | 425                       | 1730                          | 1410                 | 184                       | 700                           |
| 26    | 683                  | 205                       | 378                           | 1560                 | 195                       | 821                           | 1230                 | 193                       | 641                           |
| 27    | 683                  | 197                       | 363                           | 1700                 | 174                       | 799                           | 1090                 | 260                       | 765                           |
| 28    | 683                  | 180                       | 332                           | 1930                 | 152                       | 792                           | 1010                 | 285                       | 777                           |
| 29    | 671                  | 139                       | 252                           | 2110                 | 165                       | 940                           | 875                  | 202                       | 477                           |
| 30    | 659                  | 130                       | 231                           | 2440                 | 205                       | 1350                          | 796                  | 200                       | 430                           |
| 31    | --                   | --                        | --                            | 3100                 | 203                       | 1700                          | --                   | --                        | --                            |
| TOTAL | 17803                | --                        | 7554                          | 49564                | --                        | 23495                         | 48063                | --                        | 22794                         |

| 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     | 738                  | 220                       | 438                           | 1030                 | 250                       | 695                           | 303                  | 180                       | 147                           |
| 2     | 686                  | 243                       | 450                           | 1020                 | 251                       | 691                           | 294                  | 190                       | 151                           |
| 3     | 648                  | 236                       | 413                           | 969                  | 243                       | 636                           | 284                  | 185                       | 142                           |
| 4     | 608                  | 230                       | 378                           | 880                  | 231                       | 549                           | 273                  | 180                       | 133                           |
| 5     | 577                  | 254                       | 396                           | 849                  | 257                       | 589                           | 271                  | 190                       | 139                           |
| 6     | 570                  | 189                       | 291                           | 842                  | 260                       | 591                           | 265                  | 205                       | 147                           |
| 7     | 546                  | 190                       | 280                           | 751                  | 214                       | 434                           | 252                  | 225                       | 153                           |
| 8     | 529                  | 200                       | 286                           | 695                  | 210                       | 394                           | 245                  | 214                       | 142                           |
| 9     | 529                  | 226                       | 323                           | 645                  | 207                       | 360                           | 242                  | 200                       | 131                           |
| 10    | 526                  | 246                       | 349                           | 614                  | 200                       | 332                           | 240                  | 192                       | 124                           |
| 11    | 532                  | 253                       | 363                           | 589                  | 180                       | 286                           | 228                  | 182                       | 112                           |
| 12    | 580                  | 266                       | 417                           | 563                  | 200                       | 304                           | 222                  | 158                       | 95                            |
| 13    | 620                  | 226                       | 378                           | 531                  | 212                       | 304                           | 230                  | 177                       | 110                           |
| 14    | 739                  | 220                       | 439                           | 504                  | 171                       | 233                           | 248                  | 147                       | 98                            |
| 15    | 895                  | 225                       | 544                           | 436                  | 180                       | 212                           | 258                  | 162                       | 113                           |
| 16    | 723                  | 227                       | 443                           | 432                  | 217                       | 253                           | 255                  | 175                       | 120                           |
| 17    | 649                  | 240                       | 421                           | 418                  | 239                       | 270                           | 248                  | 174                       | 117                           |
| 18    | 629                  | 222                       | 377                           | 398                  | 208                       | 224                           | 232                  | 174                       | 109                           |
| 19    | 617                  | 242                       | 403                           | 380                  | 200                       | 205                           | 222                  | 172                       | 103                           |
| 20    | 654                  | 227                       | 401                           | 365                  | 195                       | 192                           | 215                  | 173                       | 100                           |
| 21    | 1170                 | 400                       | 1260                          | 348                  | 191                       | 179                           | 208                  | 153                       | 86                            |
| 22    | 1330                 | 363                       | 1300                          | 342                  | 197                       | 182                           | 205                  | 156                       | 86                            |
| 23    | 1090                 | 250                       | 736                           | 339                  | 190                       | 174                           | 195                  | 159                       | 84                            |
| 24    | 1020                 | 263                       | 724                           | 365                  | 198                       | 195                           | 188                  | 147                       | 75                            |
| 25    | 1010                 | 240                       | 654                           | 383                  | 200                       | 207                           | 190                  | 154                       | 79                            |
| 26    | 1050                 | 250                       | 709                           | 377                  | 202                       | 206                           | 195                  | 162                       | 85                            |
| 27    | 1090                 | 266                       | 783                           | 371                  | 202                       | 202                           | 190                  | 177                       | 91                            |
| 28    | 1110                 | 244                       | 731                           | 362                  | 194                       | 190                           | 180                  | 146                       | 71                            |
| 29    | 1070                 | 263                       | 760                           | 348                  | 188                       | 177                           | 170                  | 159                       | 73                            |
| 30    | 1050                 | 267                       | 757                           | 333                  | 190                       | 171                           | 169                  | 163                       | 74                            |
| 31    | 1050                 | 262                       | 743                           | 311                  | 185                       | 155                           | --                   | --                        | --                            |
| TOTAL | 24635                | --                        | 16947                         | 16790                | --                        | 9792                          | 6917                 | --                        | 3290                          |

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)

TOTAL DISCHARGE FOR YEAR (CFS-DAYS)  
TOTAL SUSPENDED-SEDIMENT DISCHARGE FOR YEAR (TONS)

194389.5

194389.3  
95840.3



## BIG SIOUX RIVER BASIN

111

06481500 SKUNK CREEK AT SIOUX FALLS, S. DAK.  
(Formerly published as Skunk Creek near Sioux Falls)

LOCATION.--Lat 43°32'01", long 96°47'26", in NW¼SW¼ sec.24, T.101 N., R.50 W., Minnehaha County, at gaging station, on right bank 5.0 ft downstream from bridge on Marion Road, 1.3 miles upstream from mouth, 1.8 miles downstream from small right-bank tributary, and 4.0 miles southwest of Sioux Falls.

DRAINAGE AREA.--570 sq mi, approximately.

PERIOD OF RECORD.--Chemical analyses: November 1971 to September 1972 (partial-record station).  
Sediment records: October 1971 to September 1972 (partial-record station).

REMARKS.--Prior to October 1971, sampling site was 1.9 miles upstream. 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 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRATE<br>PLUS<br>NITRITE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>03... | 1615 | 3.9                                | 10                                                      | 100                                                         | 47                                                                 | 20                                                    | 7.0                                                               | 260                                             | 270                                                     | 11                                                           | .4                                                          | .25                                                                      |
| APR.<br>25... | 1300 | 22                                 | 3.8                                                     | 110                                                         | 53                                                                 | 26                                                    | 10                                                                | 326                                             | 290                                                     | 17                                                           | .3                                                          | .02                                                                      |
| JUNE<br>28... | 0925 | 64                                 | 12                                                      | 130                                                         | 82                                                                 | 65                                                    | 14                                                                | 376                                             | 420                                                     | 55                                                           | .3                                                          | .16                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(MG/L)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(MG/L)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>03... | --                                                                  | .17                                                  | 90                                                  | 594                                                                            | .81                                                                     | 6.30                                                                  | 440                                           | 230                                                          | .4                                                 | 879                                                                   | 7.8                      | 4.4                                    |
| APR.<br>25... | .060                                                                | .16                                                  | 80                                                  | 671                                                                            | .91                                                                     | 39.9                                                                  | 490                                           | 230                                                          | .5                                                 | 1000                                                                  | 8.3                      | 9.9                                    |
| JUNE<br>28... | .19                                                                 | .28                                                  | 160                                                 | 965                                                                            | 1.31                                                                    | 167                                                                   | 660                                           | 350                                                          | 1.1                                                | 1400                                                                  | 8.1                      | 21.2                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(MG/L)<br>(80154) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| OCT.<br>06... | 1430 | 17.0                                   | 1.3                                                      | 67                                                                    | .24                                                                    |
| MAR.<br>20... | 1445 | 5.0                                    | 164                                                      | 90                                                                    | 40                                                                     |
| APR.<br>06... | 1415 | 7.0                                    | 35                                                       | 92                                                                    | 8.7                                                                    |
| MAY<br>08...  | 1215 | 12.0                                   | 286                                                      | 141                                                                   | 109                                                                    |
| JUNE<br>08... | 0910 | 21.0                                   | 178                                                      | 105                                                                   | 50                                                                     |
| JULY<br>14... | 1520 | 25.0                                   | 50                                                       | 165                                                                   | 22                                                                     |
| AUG.<br>03... | 1415 | 22.0                                   | 36                                                       | 177                                                                   | 17                                                                     |
| SEP.<br>15... | 1015 | 17.0                                   | 9.7                                                      | 136                                                                   | 3.6                                                                    |

## BIG SIOUX RIVER BASIN

06482100 BIG SIOUX RIVER NEAR BRANDON, S. DAK.

LOCATION.--Lat 43°36'25", long 96°37'55", in NE 1/4 sec.30, T.102 N., R.48 W., Minnehaha County, at gaging station, on left bank 130 ft upstream from Burlington Northern Railway bridge (corrected), 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 1972 (discontinued).

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE  | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>AMMONIA<br>GEN<br>(N)<br>(MG/L)<br>(00608) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00618) |
|-------|------|------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| NOV.  |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 03... | 1405 | 89                                 | 87                                                          | 37                                                                 | 200                                                     | 120                                                          | 10                                                           | .40                                                   |
| 18... | 1215 | 125                                | 69                                                          | 30                                                                 | 160                                                     | 85                                                           | 8.5                                                          | .34                                                   |
| DEC.  |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 13... | 1315 | 90                                 | 120                                                         | 52                                                                 | 290                                                     | 70                                                           | .47                                                          | 3.8                                                   |
| JAN.  |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 10... | 1245 | 51                                 | 110                                                         | 43                                                                 | 270                                                     | 140                                                          | 20                                                           | .84                                                   |
| 31... | 1010 | 21                                 | 120                                                         | 51                                                                 | 150                                                     | 180                                                          | 22                                                           | .69                                                   |
| MAR.  |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 31... | 1540 | 678                                | 63                                                          | 24                                                                 | 120                                                     | 14                                                           | 1.6                                                          | 1.1                                                   |
| APR.  |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 25... | 1205 | 608                                | 79                                                          | 34                                                                 | 150                                                     | 19                                                           | .31                                                          | .49                                                   |
| MAY   |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 31... | 1230 | 2910                               | 84                                                          | 35                                                                 | 160                                                     | 13                                                           | .06                                                          | .30                                                   |
| JUNE  |      |                                    |                                                             |                                                                    |                                                         |                                                              |                                                              |                                                       |
| 28... | 1045 | 1140                               | 82                                                          | 42                                                                 | 180                                                     | 21                                                           | .07                                                          | .32                                                   |

| DATE  | DIS-<br>SOLVED<br>NITRITE<br>(N)<br>(MG/L)<br>(00613) | DIS-<br>SOLVED<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>SOLIDS<br>(RESI-<br>DUE AT<br>180 C)<br>(MG/L)<br>(70300) | SPECI-<br>FIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|-------|-------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.  |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 03... | .040                                                  | .45                                                   | 2.2                                                  | 792                                                                         | 1280                                                                  | 7.0                      | 6.8                                    |
| 18... | .030                                                  | .37                                                   | 1.5                                                  | 560                                                                         | 957                                                                   | 7.3                      | 6.0                                    |
| DEC.  |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 13... | 1.5                                                   | 5.3                                                   | 1.7                                                  | 832                                                                         | 1240                                                                  | 7.3                      | .0                                     |
| JAN.  |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 10... | .000                                                  | .84                                                   | .84                                                  | 708                                                                         | 1500                                                                  | 7.6                      | .0                                     |
| 31... | .100                                                  | .79                                                   | 6.4                                                  | 1060                                                                        | 1760                                                                  | 7.5                      | .5                                     |
| MAR.  |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 31... | .030                                                  | 1.1                                                   | .52                                                  | 392                                                                         | 576                                                                   | 7.7                      | --                                     |
| APR.  |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 25... | .020                                                  | .51                                                   | .57                                                  | 502                                                                         | 697                                                                   | 8.4                      | 9.2                                    |
| MAY   |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 31... | .030                                                  | .33                                                   | .59                                                  | 502                                                                         | 723                                                                   | 7.4                      | --                                     |
| JUNE  |                                                       |                                                       |                                                      |                                                                             |                                                                       |                          |                                        |
| 28... | .030                                                  | .35                                                   | .47                                                  | 592                                                                         | 817                                                                   | 8.0                      | 22.1                                   |

## BIG SIOUX RIVER BASIN

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06482610 SPLIT ROCK CREEK AT CORSON, S. DAK.

LOCATION.--Lat 43°36'59", long 96°33'54", in NE¼NW¼ sec.26, T.102 N., 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 1972 (partial-record station).  
Sediment records: October 1970 to September 1972 (partial-record station).

## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(S04)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>03... | 1515 | 15                                 | 5.1                                                     | 67                                                          | 31                                                                 | 20                                                    | 4.1                                                               | 287                                             | 88                                                      | 11                                                           | .5                                                          | .46                                                                      |
| APR.<br>25... | 1125 | 39                                 | .1                                                      | 61                                                          | 32                                                                 | 28                                                    | 4.2                                                               | 244                                             | 100                                                     | 34                                                           | .5                                                          | .00                                                                      |
| JUNE<br>28... | 1010 | 38                                 | .1                                                      | 43                                                          | 34                                                                 | 23                                                    | 4.0                                                               | 192                                             | 120                                                     | 23                                                           | .3                                                          | .00                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(MG/L)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(MG/L)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------------------------|-----------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>03... | --                                                                  | .20                                                  | 100                                                 | 370                                                                            | .50                                                                     | 15.4                                                                  | 290                                           | 59                                                  | .5                                                 | 613                                                                   | 8.0                      | 5.4                                    |
| APR.<br>25... | .040                                                                | .26                                                  | 90                                                  | 380                                                                            | .52                                                                     | 40.0                                                                  | 280                                           | 84                                                  | .7                                                 | 648                                                                   | 8.3                      | 9.7                                    |
| JUNE<br>28... | .020                                                                | .29                                                  | 90                                                  | 342                                                                            | .47                                                                     | 7210                                                                  | 250                                           | 90                                                  | .6                                                 | 581                                                                   | 7.5                      | 22.0                                   |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>(MG/L)<br>(80154) | SUS-<br>PENDE<br>SEDI-<br>MENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------|------------------------------------------------------------------------|
| OCT.<br>06... | 1300 | 13.5                                   | 5.7                                                      | 82                                                  | 1.3                                                                    |
| MAR.<br>17... | 1125 | 6.0                                    | 486                                                      | 108                                                 | 142                                                                    |
| APR.<br>05... | 1200 | 8.0                                    | 36                                                       | 51                                                  | 5.0                                                                    |
| MAY<br>04...  | 1405 | 14.0                                   | 490                                                      | 96                                                  | 127                                                                    |
| JUNE<br>08... | 1330 | 23.5                                   | 140                                                      | 78                                                  | 30                                                                     |
| AUG.<br>03... | 1100 | 21.0                                   | 34                                                       | 96                                                  | 8.8                                                                    |
| SEP.<br>14... | 1410 | 19.5                                   | 10                                                       | 120                                                 | 3.2                                                                    |

## 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 1971 TO SEPTEMBER 1972

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HC03)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(S04)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>18... | 1045 | 248                                | 9.4                                                     | 100                                                         | 39                                                                 | 73                                                    | 6.4                                                               | 270                                             | 200                                                     | 90                                                           | .4                                                          | 2.3                                                                      |
| APR.<br>28... | 1335 | 1260                               | 10                                                      | 87                                                          | 38                                                                 | 21                                                    | 6.0                                                               | 274                                             | 160                                                     | 21                                                           | .3                                                          | 1.3                                                                      |
| MAY<br>31...  | 1145 | 3770                               | 15                                                      | 88                                                          | 37                                                                 | 18                                                    | 7.2                                                               | 268                                             | 170                                                     | 13                                                           | .4                                                          | 1.5                                                                      |
| JUNE<br>28... | 1510 | 1860                               | 12                                                      | 78                                                          | 38                                                                 | 23                                                    | 7.2                                                               | 254                                             | 170                                                     | 15                                                           | .2                                                          | .68                                                                      |

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| NOV.<br>18... | --                                                                  | .94                                                  | 120                                                 | 664                                                                            | .90                                                           | 445                                                         | 410                                           | 190                                                          | 1.6                                                | 1110                                                                  | 7.6                      | 5.4                                    |
| APR.<br>28... | --                                                                  | .45                                                  | 90                                                  | 485                                                                            | .66                                                           | 1650                                                        | 370                                           | 150                                                          | .5                                                 | 777                                                                   | 7.8                      | 9.8                                    |
| MAY<br>31...  | .25                                                                 | .73                                                  | 110                                                 | 488                                                                            | .66                                                           | 4970                                                        | 370                                           | 150                                                          | .4                                                 | 755                                                                   | 7.0                      | --                                     |
| JUNE<br>28... | .14                                                                 | .52                                                  | 120                                                 | 472                                                                            | .64                                                           | 2370                                                        | 350                                           | 140                                                          | .5                                                 | 736                                                                   | 7.9                      | 24.0                                   |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|------------------------------------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| NOV.<br>18... | 1045 | 248                                | 100                                                          | 20                                                  | 90                                                            | 1                                                      | 0                                                           | 0                                                            | 0                                                     | 1                                                     |
| APR.<br>28... | 1335 | 1260                               | 0                                                            | 20                                                  | 0                                                             | 6                                                      | 1                                                           | --                                                           | 2                                                     | 3                                                     |

| DATE          | TIME | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>SILVER<br>(AG)<br>(UG/L)<br>(01075) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) |
|---------------|------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|
| NOV.<br>18... |      | 0                                                   | 38                                                     | .0                                            | 0                                                              | 12                                                    | 6                                                            | 0                                                     | 450                                                           | 2.3                                                         |
| APR.<br>28... |      | 5                                                   | 20                                                     | .1                                            | 0                                                              | 5                                                     | 5                                                            | 1                                                     | 350                                                           | 2.2                                                         |

## BIG SIOUX RIVER BASIN

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06485500 BIG SIOUX RIVER AT AKRON, IOWA--Continued

PERIOD OF RECORD.--Chemical analyses: June 1967 to September 1972 (partial-record station).  
Sediment records: September 1970 to September 1972 (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 1971 TO SEPTEMBER 1972

## PESTICIDES

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | ALDRIN<br>(UG/L)<br>(39330) | ALDRIN<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39333) | LINDANE<br>(UG/L)<br>(39340) | LINDANE<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39343) | CHLOR-<br>DANE<br>(UG/L)<br>(39350) | CHLOR-<br>DANE<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39351) | DDD<br>(UG/L)<br>(39360) |
|---------------|------|------------------------------------|-----------------------------|---------------------------------------------------------------|------------------------------|----------------------------------------------------------------|-------------------------------------|-----------------------------------------------------------------------|--------------------------|
| JAN.<br>12... | 1030 | 136                                | .00                         | <.2                                                           | .00                          | <.2                                                            | .0                                  | <1.0                                                                  | .00                      |
| MAR.<br>16... | 1545 | 9810                               | .00                         | --                                                            | .00                          | --                                                             | .0                                  | --                                                                    | .00                      |
| JUNE<br>01... | 1300 | 3870                               | .00                         | <.2                                                           | .00                          | <.2                                                            | .0                                  | 7.1                                                                   | .00                      |
| SEP.<br>11... | 1450 | 464                                | .00                         | --                                                            | .00                          | --                                                             | .0                                  | --                                                                    | .00                      |

| DATE          | DDD<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39363) | DDE<br>(UG/L)<br>(39365) | DDE<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39368) | DDT<br>(UG/L)<br>(39370) | DDT<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39373) | DI-<br>ELDRIN<br>(UG/L)<br>(39380) | DI-<br>ELDRIN<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39383) | ENDRIN<br>(UG/L)<br>(39390) | ENDRIN<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39393) |
|---------------|------------------------------------------------------------|--------------------------|------------------------------------------------------------|--------------------------|------------------------------------------------------------|------------------------------------|----------------------------------------------------------------------|-----------------------------|---------------------------------------------------------------|
| JAN.<br>12... | <.2                                                        | .00                      | <.2                                                        | .01                      | <.2                                                        | .01                                | <.2                                                                  | .00                         | <.2                                                           |
| MAR.<br>16... | --                                                         | .00                      | --                                                         | .00                      | --                                                         | .01                                | --                                                                   | .00                         | --                                                            |
| JUNE<br>01... | .7                                                         | .00                      | <.2                                                        | .00                      | 1.3                                                        | .01                                | 5.2                                                                  | .00                         | <.2                                                           |
| SEP.<br>11... | --                                                         | .00                      | --                                                         | .00                      | --                                                         | .00                                | --                                                                   | .00                         | --                                                            |

| DATE          | HEPTA-<br>CHLOR<br>(UG/L)<br>(39410) | HEPTA-<br>CHLOR<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/L)<br>(39413) | HEPTA-<br>CHLOR<br>EPOXIDE<br>(UG/L)<br>(39420) | HEPTA-<br>CHLOR<br>EPOXIDE<br>IN BOT-<br>TOM DE-<br>POSITS<br>(UG/KG)<br>(39423) | PCB<br>(UG/L)<br>(39516) | PCB<br>IN<br>BOTTOM<br>DE-<br>POSITS<br>(UG/KG)<br>(39519) | 2,4-D<br>(UG/L)<br>(39730) | 2,4,5-T<br>(UG/L)<br>(39740) | SILVEX<br>(UG/L)<br>(39760) |
|---------------|--------------------------------------|-----------------------------------------------------------------------|-------------------------------------------------|----------------------------------------------------------------------------------|--------------------------|------------------------------------------------------------|----------------------------|------------------------------|-----------------------------|
| JAN.<br>12... | .00                                  | <.2                                                                   | .00                                             | <.2                                                                              | .0                       | <2.0                                                       | .00                        | .00                          | .00                         |
| MAR.<br>16... | .00                                  | --                                                                    | .00                                             | --                                                                               | .0                       | --                                                         | .03                        | .01                          | .00                         |
| JUNE<br>01... | .00                                  | <.2                                                                   | .00                                             | <.2                                                                              | .0                       | <2.0                                                       | .06                        | .00                          | .00                         |
| SEP.<br>11... | .00                                  | --                                                                    | .00                                             | --                                                                               | .0                       | --                                                         | .03                        | .00                          | .00                         |

## SUSPENDED-SEDIMENT DISCHARGE MEASUREMENTS, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

| DATE          | TIME | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) | INSTAN-<br>TANEOUS<br>DIS-<br>CHARGE<br>(CFS)<br>(00061) | SUS-<br>PEN-<br>DED<br>SEDIM-<br>ENT<br>DIS-<br>CHARGE<br>(MG/L)<br>(80154) | SUS-<br>PEN-<br>DED<br>SEDIM-<br>ENT<br>DIS-<br>CHARGE<br>(T/DAY)<br>(80155) |
|---------------|------|----------------------------------------|----------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------|
| APR.<br>04... | 1530 | 9.0                                    | 1150                                                     | 213                                                                         | 661                                                                          |
| JULY<br>06... | 1020 | 19.0                                   | 1440                                                     | 347                                                                         | 1350                                                                         |
| AUG.<br>11... | 1600 | 24.0                                   | 1230                                                     | 1660                                                                        | 5510                                                                         |
| SEP.<br>11... | 1445 | 19.0                                   | 464                                                      | 236                                                                         | 296                                                                          |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES  
 CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## MISSOURI RIVER BASIN

OAHÉ RESERVOIR NEAR KENEL, S. DAK. (LAT 45 55 09 LONG 100 30 58)

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SIO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE<br>15... | 1800 | --                                 | 5.6                                                     | 51                                                          | 21                                                                 | 66                                                    | 4.5                                                               | 185                                             | 190                                                     | 7.8                                                          | .5                                                          | .00                                                                      |

| DATE          | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|---------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| JUNE<br>15... | 1800 | 0                                                            | 30                                                  | 0                                                             | .060                                 | .006                               | 2                                                      | 0                                                     | 0                                                   | 0                                                            | 1                                                     |

## GRAND RIVER BASIN

06357000 SHADEHILL RESERVOIR AT SHADEHILL, S. DAK. (LAT 45 45 12 LONG 102 12 12)

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SIO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| APR.<br>18... | 1430 | --                                 | 4.8                                                     | 28                                                          | 16                                                                 | 150                                                   | 7.5                                                               | 246                                             | 260                                                     | 7.1                                                          | .3                                                          | .28                                                                      |

06357500 GRAND RIVER AT SHADEHILL, S. DAK. (LAT 45 45 25 LONG 102 11 24)

|               |      |     |     |    |    |     |     |     |     |     |    |     |
|---------------|------|-----|-----|----|----|-----|-----|-----|-----|-----|----|-----|
| DEC.<br>01... | 1345 | 97  | 5.2 | 33 | 18 | 200 | 7.4 | 311 | 340 | 4.6 | .3 | .24 |
| JUNE<br>15... | 1500 | 300 | 3.5 | 34 | 21 | 180 | 7.8 | 274 | 360 | 3.2 | .3 | .11 |

| DATE          | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| JUNE<br>15... | 1500 | 50                                                           | 160                                                 | 10                                                            | 0                                                      | 0                                                     | 0                                                   | 0                                                            | 10                                                    | 4                                                     |

GRAND RIVER NEAR MCINTOSH, S. DAK. (LAT 45 41 16 LONG 101 20 18)

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SIO2)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE<br>15... | 1300 | --                                 | 3.8                                                     | 36                                                          | 21                                                                 | 200                                                   | 7.8                                                               | 299                                             | 350                                                     | 5.8                                                          | .4                                                          | .10                                                                      |

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

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## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## MISSOURI RIVER BASIN

## OAHE RESERVOIR NEAR KENEL, S. DAK. (LAT 45 55 09 LONG 100 30 58)

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORDON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| JUNE<br>15... | --                                                                  | --                                                   | 130                                                  | 438                                                                            | .62                                                           | --                                                          | 210                                           | 62                                                           | 2.0                                                | 675                                                                   | 7.9                      | 23.5                                   |

| DATE          | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(MG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|---------------|-------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| JUNE<br>15... | 2                                                     | 2                                                   | 40                                                     | .1                                            | 2                                                              | 4                                                     | 4                                                            | 500                                                           | 1.0                                                         | 10                                                  |

## GRAND RIVER BASIN

## 06357000 SHADEHILL RESERVOIR AT SHADEHILL, S. DAK. (LAT 45 45 12 LONG 102 12 12)

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORDON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| APR.<br>18... | .000                                                                | .000                                                 | 280                                                  | 596                                                                            | .81                                                           | --                                                          | 140                                           | 0                                                            | 5.6                                                | 910                                                                   | 8.2                      | 6.0                                    |

## 06357500 GRAND RIVER AT SHADEHILL, S. DAK. (LAT 45 45 25 LONG 102 11 24)

|               |    |      |     |     |      |     |     |   |     |      |     |      |
|---------------|----|------|-----|-----|------|-----|-----|---|-----|------|-----|------|
| DEC.<br>01... | -- | .030 | 340 | 763 | 1.04 | 200 | 160 | 0 | 7.0 | 1190 | 8.3 | 2.0  |
| JUNE<br>15... | -- | --   | 330 | 746 | 1.16 | 604 | 170 | 0 | 6.0 | 1130 | 8.1 | 22.0 |

| DATE          | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(MG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>SILVER<br>(AG)<br>(UG/L)<br>(01075) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|---------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| JUNE<br>15... | 2                                                   | 0                                                      | .1                                            | 3                                                              | 0                                                     | 6                                                            | 0                                                     | 410                                                           | 2.0                                                         | 10                                                  |

## GRAND RIVER NEAR MCINTOSH, S. DAK. (LAT 45 41 16 LONG 101 20 18)

| DATE          | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORDON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|---------------|---------------------------------------------------------------------|------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| JUNE<br>15... | .020                                                                | .15                                                  | 330                                                  | 773                                                                            | 1.12                                                          | --                                                          | 180                                           | 0                                                            | 6.6                                                | 1200                                                                  | 8.1                      | 25.5                                   |



ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES  
CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

MOREAU RIVER BASIN

06359500 MOREAU RIVER NEAR FAITH, S. DAK. (LAT 45 11 52 LONG 102 09 22)

| DATE       | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE 14... | 1800 | 309                                | 7.6                                                     | 18                                                          | 5.3                                                                | 130                                                   | 5.9                                                               | 222                                             | 190                                                     | 2.2                                                          | .3                                                          | 3.4                                                                      |

| DATE       | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| JUNE 14... | 1800 | 10                                                           | 250                                                 | 3                                                             | .030                                 | .020                               | 1                                                      | 0                                                     | 4                                                           | 0                                                            | 7                                                     |

06360000 MOREAU RIVER NEAR EAGLE BUTTE, S. DAK. (LAT 45 11 20 LONG 101 13 05)

| DATE       | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE 15... | 1000 | --                                 | 8.7                                                     | 75                                                          | 24                                                                 | 220                                                   | 9.5                                                               | 252                                             | 540                                                     | 9.1                                                          | .4                                                          | .03                                                                      |

MISSOURI RIVER BASIN

06361070 OAHE RESERVOIR NEAR FOREST CITY, S. DAK. (LAT 45 01 20 LONG 100 15 13)

| DATE       | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| JUNE 16... | 1000 | 10                                                           | 40                                                  | 30                                                            | .030                                 | .007                               | 1                                                      | 0                                                     | 0                                                           | 0                                                            | 1                                                     |

CHEYENNE RIVER BASIN

06385000 CHEYENNE RIVER NEAR PLAINVIEW, S. DAK. (LAT 44 31 16 LONG 101 59 34)

| DATE       | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE 14... | 1700 | 3080                               | 14                                                      | 91                                                          | 26                                                                 | 78                                                    | 10                                                                | 160                                             | 360                                                     | 9.0                                                          | .5                                                          | .88                                                                      |

| DATE       | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| JUNE 14... | 1700 | 0                                                            | 30                                                  | 0                                                             | .050                                 | .010                               | 7                                                      | 0                                                     | 0                                                           | 0                                                            | 7                                                     |

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

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## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## MOREAU RIVER BASIN

06359500 MOREAU RIVER NEAR FAITH, S. DAK. (LAT 45 11 52 LONG 102 09 22)

| DATE       | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORON (B) (UG/L) (01020)    | DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900)        | NON-CARBONATE HARDNESS (MG/L) (00902)    | SODIUM AD-SORPTION RATIO (00931)       | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|------------|------------------------------------------|-------------------------------------|----------------------------------------|--------------------------------------------------------|--------------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|----------------------------------------|-------------------------------------------|--------------------|-----------------------------|
| JUNE 14... | --                                       | --                                  | 140                                    | 484                                                    | .72                                        | 404                                      | 67                                      | 0                                        | 6.9                                    | 749                                       | 7.7                | 22.0                        |
| DATE       | DIS-SOLVED COPPER (CU) (UG/L) (01040)    | DIS-SOLVED LEAD (PB) (UG/L) (01049) | DIS-SOLVED LITHIUM (LI) (UG/L) (01130) | TOTAL MERCURY (HG) (UG/L) (71900)                      | DIS-SOLVED MOLYBDENUM (MO) (UG/L) (01060)  | DIS-SOLVED NICKEL (NI) (UG/L) (01065)    | DIS-SOLVED SELENIUM (SE) (UG/L) (01145) | DIS-SOLVED STRONTIUM (SR) (UG/L) (01080) | DIS-SOLVED VANADIUM (V) (UG/L) (01085) | DIS-SOLVED ZINC (ZN) (UG/L) (01090)       |                    |                             |
| JUNE 14... |                                          | 32                                  | 7                                      | 40                                                     | .6                                         | 3                                        | 6                                       | 10                                       | 180                                    | 2.4                                       | 50                 |                             |

06360000 MOREAU RIVER NEAR EAGLE BUTTE, S. DAK. (LAT 45 11 20 LONG 101 13 05)

| DATE       | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORON (B) (UG/L) (01020) | DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM AD-SORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|------------|------------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|----------------------------------|-------------------------------------------|--------------------|-----------------------------|
| JUNE 15... | .050                                     | .63                                 | 60                                  | 1010                                                   | 1.41                                       | --                                       | 290                              | 79                                    | 5.7                              | 1460                                      | 7.8                | 21.0                        |

## MISSOURI RIVER BASIN

06361070 OAAE RESERVOIR NEAR FOREST CITY, S. DAK. (LAT 45 01 20 LONG 100 15 13)

| DATE       | DIS-SOLVED COPPER (CU) (UG/L) (01040) | DIS-SOLVED LEAD (PB) (UG/L) (01049) | DIS-SOLVED LITHIUM (LI) (UG/L) (01130) | TOTAL MERCURY (HG) (UG/L) (71900) | DIS-SOLVED MOLYBDENUM (MO) (UG/L) (01060) | DIS-SOLVED NICKEL (NI) (UG/L) (01065) | DIS-SOLVED SELENIUM (SE) (UG/L) (01145) | DIS-SOLVED STRONTIUM (SR) (UG/L) (01080) | DIS-SOLVED VANADIUM (V) (UG/L) (01085) | DIS-SOLVED ZINC (ZN) (UG/L) (01090) |    |  |
|------------|---------------------------------------|-------------------------------------|----------------------------------------|-----------------------------------|-------------------------------------------|---------------------------------------|-----------------------------------------|------------------------------------------|----------------------------------------|-------------------------------------|----|--|
| JUNE 16... |                                       | 8                                   | 2                                      | 40                                | .1                                        | 2                                     | 2                                       | 3                                        | 420                                    | .9                                  | 20 |  |

## CHEYENNE RIVER BASIN

06385000 CHEYENNE RIVER NEAR PLAINVIEW, S. DAK. (LAT 44 31 16 LONG 101 59 34)

| DATE       | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORON (B) (UG/L) (01020)    | DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900)        | NON-CARBONATE HARDNESS (MG/L) (00902)    | SODIUM AD-SORPTION RATIO (00931)       | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|------------|------------------------------------------|-------------------------------------|----------------------------------------|--------------------------------------------------------|--------------------------------------------|------------------------------------------|-----------------------------------------|------------------------------------------|----------------------------------------|-------------------------------------------|--------------------|-----------------------------|
| JUNE 14... | --                                       | --                                  | 180                                    | 672                                                    | 1.02                                       | 5590                                     | 330                                     | 200                                      | 1.9                                    | 959                                       | 7.5                | 23.5                        |
| DATE       | DIS-SOLVED COPPER (CU) (UG/L) (01040)    | DIS-SOLVED LEAD (PB) (UG/L) (01049) | DIS-SOLVED LITHIUM (LI) (UG/L) (01130) | TOTAL MERCURY (HG) (UG/L) (71900)                      | DIS-SOLVED MOLYBDENUM (MO) (UG/L) (01060)  | DIS-SOLVED NICKEL (NI) (UG/L) (01065)    | DIS-SOLVED SELENIUM (SE) (UG/L) (01145) | DIS-SOLVED STRONTIUM (SR) (UG/L) (01080) | DIS-SOLVED VANADIUM (V) (UG/L) (01085) | DIS-SOLVED ZINC (ZN) (UG/L) (01090)       |                    |                             |
| JUNE 14... |                                          | 4                                   | 4                                      | 70                                                     | .7                                         | 4                                        | 2                                       | 8                                        | 990                                    | .8                                        | 10                 |                             |

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## CHEYENNE RIVER BASIN (Continued)

RED COAT CREEK AT RED SCAFFOLD, S. DAK. (LAT 44 45 45 LONG 100 50 00)

| DATE         | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|--------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| MAY<br>10... | 1800 | 2.5                                | 6.1                                                     | 71                                                          | 24                                                                 | 140                                                   | 7.6                                                               | 154                                             | 460                                                     | 8.3                                                          | .3                                                          | .07                                                                      |

| DATE         | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|--------------|------|------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| MAY<br>10... | 1800 | 2.5                                | 60                                                  | 0                                                             | .070                                 | .002                               | 8                                                      | 0                                                     | 0                                                           | 0                                                            | 0                                                     |

CHERRY CREEK AT CHERRY CREEK, S. DAK. (LAT 44 36 13 LONG 101 30 33)

| DATE         | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|--------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| MAY<br>11... | 1100 | 70                                 | 8.9                                                     | 78                                                          | 30                                                                 | 170                                                   | 8.0                                                               | 145                                             | 540                                                     | 17                                                           | .2                                                          | .29                                                                      |

| DATE         | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|--------------|------|------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| MAY<br>11... | 1100 | 70                                 | 50                                                  | 0                                                             | .080                                 | .006                               | 0                                                      | 0                                                     | 0                                                           | 0                                                            | 0                                                     |

06439500 CHEYENNE RIVER NEAR EAGLE BUTTE, S. DAK. (LAT 44 41 40 LONG 101 13 05)

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| JUNE<br>14... | 1500 | --                                 | 9.5                                                     | 85                                                          | 24                                                                 | 67                                                    | 9.8                                                               | 135                                             | 330                                                     | 15                                                           | .4                                                          | .95                                                                      |

| DATE          | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | BROMIDE<br>(BR)<br>(MG/L)<br>(71870) | IODIDE<br>(I)<br>(MG/L)<br>(71865) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>BARIUM<br>(BA)<br>(UG/L)<br>(01005) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) |
|---------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------|------------------------------------|--------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| JUNE<br>14... | 1500 | 10                                                           | 90                                                  | 0                                                             | .050                                 | .005                               | 8                                                      | 0                                                     | 1                                                           | 0                                                            | 10                                                    |

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

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## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## CHEYENNE RIVER BASIN (Continued)

## RED COAT CREEK AT RED SCAFFOLD, S. DAK. (LAT 44 45 45 LONG 100 50 00)

| DATE      | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|-----------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| MAY 10... | --                                                                  | .23                                                  | 80                                                  | 794                                                                            | 1.08                                                          | 5.36                                                        | 280                                           | 150                                                          | 3.7                                                | 1130                                                                  | 7.8                      | 9.0                                    |

| DATE      | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|-----------|-------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| MAY 10... | 4                                                     | 2                                                   | 75                                                     | .1                                            | 2                                                              | 5                                                     | 7                                                            | 780                                                           | .2                                                          |                                                     |

## CHERRY CREEK AT CHERRY CREEK, S. DAK. (LAT 44 36 13 LONG 101 30 33)

| DATE      | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|-----------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| MAY 11... | --                                                                  | 1.0                                                  | 200                                                 | 926                                                                            | 1.26                                                          | 175                                                         | 320                                           | 200                                                          | 4.1                                                | 1282                                                                  | 7.6                      | 9.0                                    |

| DATE      | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|-----------|-------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| MAY 11... | 5                                                     | 1                                                   | 83                                                     | .2                                            | 5                                                              | 6                                                     | 9                                                            | 840                                                           | 2.0                                                         | 20                                                  |

## 06439500 CHEYENNE RIVER NEAR EAGLE BUTTE, S. DAK. (LAT 44 41 40 LONG 101 13 05)

| DATE       | DIS-<br>SOL-<br>VED-<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00666) | TOTAL<br>PHOS-<br>PHORUS<br>(P)<br>(MG/L)<br>(00665) | DIS-<br>SOLVED<br>BORON<br>(B)<br>(UG/L)<br>(01020) | DIS-<br>SOLVED<br>SOLIDS<br>(SUM OF<br>CONSTI-<br>TUENTS)<br>(MG/L)<br>(70301) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>AC-FT)<br>(70303) | DIS-<br>SOLVED<br>SOLIDS<br>(TONS<br>PER<br>DAY)<br>(70302) | HARD-<br>NESS<br>(CA,MG)<br>(MG/L)<br>(00900) | NON-<br>CAR-<br>BONATE<br>HARD-<br>NESS<br>(MG/L)<br>(00902) | SODIUM<br>AD-<br>SORP-<br>TION<br>RATIO<br>(00931) | SPE-<br>CIFIC<br>CON-<br>DUCT-<br>ANCE<br>(MICRO-<br>MHOS)<br>(00095) | PH<br>(UNITS)<br>(00400) | TEMPER-<br>ATURE<br>(DEG C)<br>(00010) |
|------------|---------------------------------------------------------------------|------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------------------|--------------------------|----------------------------------------|
| JUNE 14... | --                                                                  | --                                                   | 180                                                 | 612                                                                            | .94                                                           | --                                                          | 310                                           | 200                                                          | 1.7                                                | 867                                                                   | 7.4                      | 23.5                                   |

| DATE       | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) | DIS-<br>SOLVED<br>LEAD<br>(PB)<br>(UG/L)<br>(01049) | DIS-<br>SOLVED<br>LITHIUM<br>(LI)<br>(UG/L)<br>(01130) | TOTAL<br>MERCURY<br>(HG)<br>(UG/L)<br>(71900) | DIS-<br>SOLVED<br>MOLYB-<br>DENUM<br>(MO)<br>(UG/L)<br>(01060) | DIS-<br>SOLVED<br>NICKEL<br>(NI)<br>(UG/L)<br>(01065) | DIS-<br>SOLVED<br>SELE-<br>NIUM<br>(SE)<br>(UG/L)<br>(01145) | DIS-<br>SOLVED<br>STRON-<br>TIUM<br>(SR)<br>(UG/L)<br>(01080) | DIS-<br>SOLVED<br>VANA-<br>DIUM<br>(V)<br>(UG/L)<br>(01085) | DIS-<br>SOLVED<br>ZINC<br>(ZN)<br>(UG/L)<br>(01090) |
|------------|-------------------------------------------------------|-----------------------------------------------------|--------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------|-----------------------------------------------------|
| JUNE 14... | 7                                                     | 4                                                   | 70                                                     | 1.0                                           | 3                                                              | 9                                                     | 10                                                           | 820                                                           | .6                                                          | 20                                                  |

ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES  
 CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## JAMES RIVER BASIN

06473500 S. FK. SNAKE CREEK NEAR ATHOL, S. DAK. (LAT 45 03 20 LONG 098 44 10)

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | DIS-<br>SOLVED<br>BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| MAR.<br>17... | 1310 | 1120                               | --                                                      | 15                                                          | 6.0                                                                | --                                                    | --                                                                | --                                                                | 37                                                      | 15                                                           | --                                                          | .97                                                                      |
| JUNE<br>15... | 1745 | 7.4                                | 8.3                                                     | 75                                                          | 34                                                                 | 76                                                    | 17                                                                | 315                                                               | 180                                                     | 57                                                           | .4                                                          | .00                                                                      |

| DATE          | TIME | DIS-<br>SOLVED<br>ALUM-<br>INUM<br>(AL)<br>(UG/L)<br>(01106) | DIS-<br>SOLVED<br>IRON<br>(FE)<br>(UG/L)<br>(01046) | DIS-<br>SOLVED<br>MAN-<br>GANESE<br>(MN)<br>(UG/L)<br>(01056) | DIS-<br>SOLVED<br>ARSENIC<br>(AS)<br>(UG/L)<br>(01000) | DIS-<br>SOLVED<br>CAD-<br>MIUM<br>(CD)<br>(UG/L)<br>(01025) | DIS-<br>SOLVED<br>CHRO-<br>MIUM<br>(CR)<br>(UG/L)<br>(01030) | DIS-<br>SOLVED<br>COBALT<br>(CO)<br>(UG/L)<br>(01035) | DIS-<br>SOLVED<br>COPPER<br>(CU)<br>(UG/L)<br>(01040) |
|---------------|------|--------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------|
| JUNE<br>15... | 1745 | 0                                                            | 60                                                  | 480                                                           | 4                                                      | 0                                                           | 0                                                            | 10                                                    | 1                                                     |

## BIG SIOUX RIVER BASIN

06482830 BEAVER CREEK NEAR CANTON, S. DAK. (LAT 43 19 04 LONG 096 36 31)

| DATE          | TIME | DIS-<br>CHARGE<br>(CFS)<br>(00060) | DIS-<br>SOLVED<br>SILICA<br>(SI02)<br>(MG/L)<br>(00955) | DIS-<br>SOLVED<br>CAL-<br>CIUM<br>(CA)<br>(MG/L)<br>(00915) | DIS-<br>SOLVED<br>MAG-<br>NE-<br>SIUM<br>(MG)<br>(MG/L)<br>(00925) | DIS-<br>SOLVED<br>SODIUM<br>(NA)<br>(MG/L)<br>(00930) | DIS-<br>SOLVED<br>PO-<br>TAS-<br>SIUM<br>(K)<br>(MG/L)<br>(00935) | DIS-<br>SOLVED<br>BICAR-<br>BONATE<br>(HCO3)<br>(MG/L)<br>(00440) | DIS-<br>SOLVED<br>SULFATE<br>(SO4)<br>(MG/L)<br>(00945) | DIS-<br>SOLVED<br>CHLO-<br>RIDE<br>(CL)<br>(MG/L)<br>(00940) | DIS-<br>SOLVED<br>FLUO-<br>RIDE<br>(F)<br>(MG/L)<br>(00950) | DIS-<br>SOLVED<br>NITRITE<br>PLUS<br>NITRATE<br>(N)<br>(MG/L)<br>(00631) |
|---------------|------|------------------------------------|---------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|-------------------------------------------------------------------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------------|--------------------------------------------------------------------------|
| NOV.<br>04... | 0925 | 1.3                                | 20                                                      | 370                                                         | 150                                                                | 80                                                    | 11                                                                | 347                                                               | 1400                                                    | 5.7                                                          | .3                                                          | .89                                                                      |
| APR.<br>25... | 1405 | --                                 | 4.6                                                     | 330                                                         | 140                                                                | 65                                                    | 9.2                                                               | 282                                                               | 1300                                                    | 5.3                                                          | .4                                                          | .13                                                                      |
| JUNE<br>28... | 1250 | --                                 | 6.5                                                     | 280                                                         | 130                                                                | 70                                                    | 10                                                                | 261                                                               | 1200                                                    | 4.8                                                          | .3                                                          | .26                                                                      |

NOTE.--Carbonate (CO<sub>3</sub>) analysis for all samples, 0.0 mg/l.

## ANALYSES OF SAMPLES COLLECTED AT MISCELLANEOUS SITES

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## CHEMICAL ANALYSES, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972

## JAMES RIVER BASIN

06473500 S. FK. SNAKE CREEK NEAR ATHOL, S. DAK. (LAT 45 03 20 LONG 098 44 10)

| DATE       | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORON (B) (UG/L) (01020) | DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM ADSORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|------------|------------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|-------------------------------------------|--------------------|-----------------------------|
| MAR. 17... | --                                       | .81                                 | --                                  | --                                                     | --                                         | --                                       | 62                               | --                                    | --                              | 223                                       | 6.6                | 32.0                        |
| JUNE 15... | --                                       | .47                                 | 310                                 | 605                                                    | .82                                        | 12.1                                     | 330                              | 69                                    | 1.8                             | 971                                       | 8.0                | 25.5                        |

| DATE       | DIS-SOLVED LEAD (PB) (UG/L) (01049) | DIS-SOLVED LITHIUM (LI) (UG/L) (01130) | TOTAL MERCURY (HG) (UG/L) (71900) | 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) |
|------------|-------------------------------------|----------------------------------------|-----------------------------------|-------------------------------------------|---------------------------------------|-----------------------------------------|---------------------------------------|------------------------------------------|----------------------------------------|
| JUNE 15... | 7                                   | 30                                     | .0                                | 0                                         | 0                                     | 4                                       | 0                                     | 600                                      | 1.8                                    |

## BIG SIOUX RIVER BASIN

06482830 BEAVER CREEK NEAR CANTON, S. DAK. (LAT 43 19 04 LONG 096 36 31)

| DATE           | DIS-SOLVED-PHOSPHORUS (P) (MG/L) (00666) | TOTAL PHOSPHORUS (P) (MG/L) (00665) | DIS-SOLVED BORON (B) (UG/L) (01020) | DIS-SOLVED SOLIDS (SUM OF CONSTITUENTS) (MG/L) (70301) | DIS-SOLVED SOLIDS (TONS PER AC-FT) (70303) | DIS-SOLVED SOLIDS (TONS PER DAY) (70302) | HARDNESS (CA, MG) (MG/L) (00900) | NON-CARBONATE HARDNESS (MG/L) (00902) | SODIUM ADSORPTION RATIO (00931) | SPECIFIC CONDUCTANCE (MICRO-MHOS) (00095) | PH (UNITS) (00400) | TEMPERATURE (DEG C) (00010) |
|----------------|------------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------------------------|--------------------------------------------|------------------------------------------|----------------------------------|---------------------------------------|---------------------------------|-------------------------------------------|--------------------|-----------------------------|
| NOV. 04...     | --                                       | .080                                | 310                                 | 2210                                                   | 3.01                                       | 8.17                                     | 1500                             | 1300                                  | .9                              | 2530                                      | 7.6                | 1.1                         |
| APR. 25...     | .030                                     | .040                                | 250                                 | 1990                                                   | 2.71                                       | --                                       | 1400                             | 1200                                  | .8                              | 2310                                      | 7.9                | 14.4                        |
| JUNE 28...     | .030                                     | .070                                | 280                                 | 1830                                                   | 2.49                                       | --                                       | 1200                             | 1000                                  | .9                              | 2140                                      | 7.7                | 23.9                        |
| TIME WTD. AVG. | --                                       | .064                                | 280                                 | 2010                                                   | 2.74                                       | --                                       | 1370                             | 1170                                  | .9                              | 2330                                      | 7.7                | --                          |





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