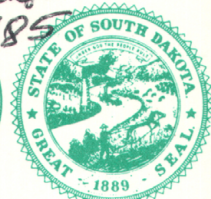
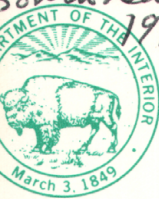
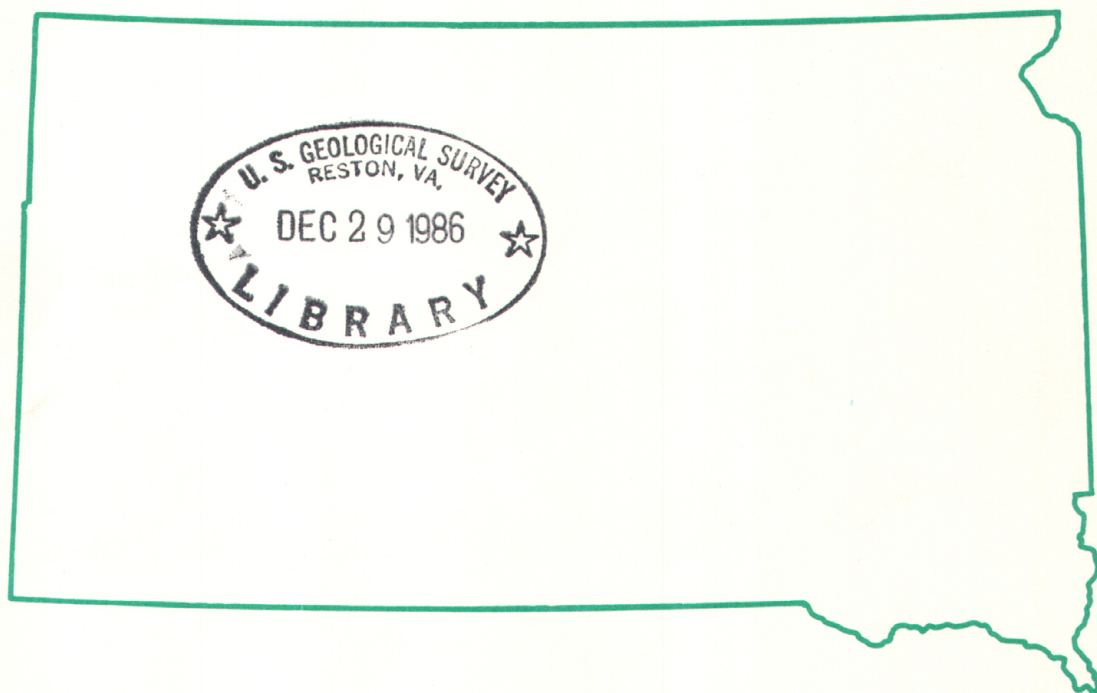


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South Dakota  
1985



# Water Resources Data South Dakota Water Year 1985



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT SD-85-1  
Prepared in cooperation with the State of South Dakota  
and with other agencies



# CALENDAR FOR WATER YEAR 1985

1984

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

1985

J A N U A R Y							F E B R U A R Y							M A R C H						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
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13	14	15	16	17	18	19	3	4	5	6	7	8	9	10	11	12	13	14	15	16
20	21	22	23	24	25	26	10	11	12	13	14	15	16	17	18	19	20	21	22	23
27	28	29	30	31			17	18	19	20	21	22	23	24	25	26	27	28	29	30
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A P R I L							M A Y							J U N E						
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7	8	9	10	11	12	13								2	3	4	5	6	7	8
14	15	16	17	18	19	20	5	6	7	8	9	10	11	9	10	11	12	13	14	15
21	22	23	24	25	26	27	12	13	14	15	16	17	18	16	17	18	19	20	21	22
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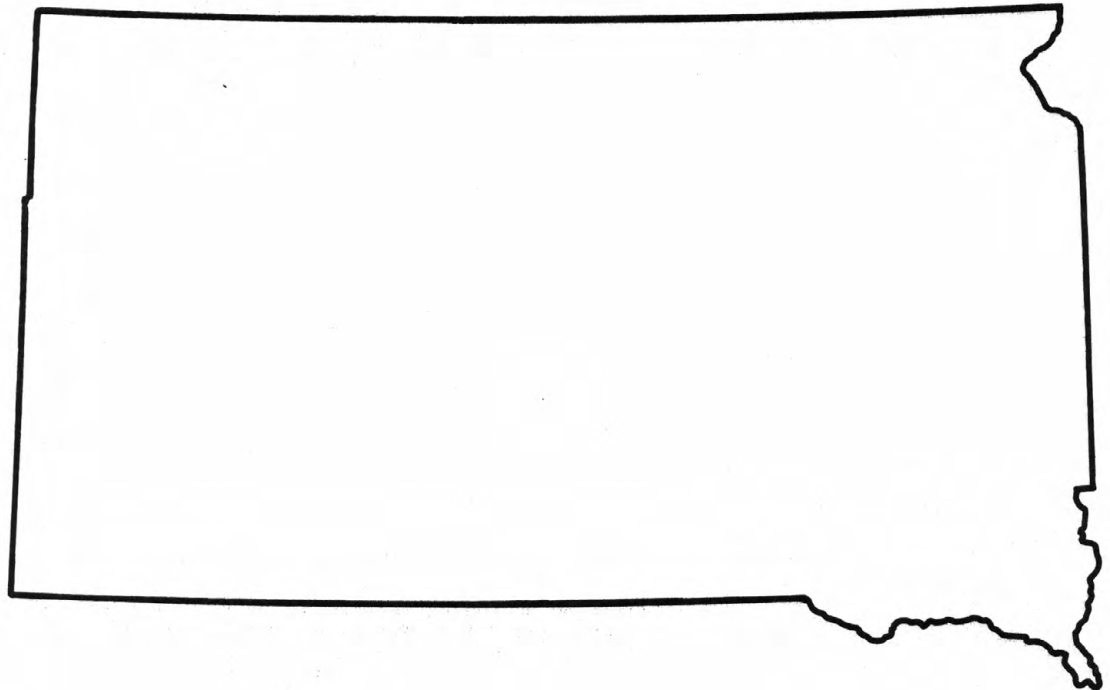
J U L Y							A U G U S T							S E P T E M B E R						
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21	22	23	24	25	26	27	11	12	13	14	15	16	17	22	23	24	25	26	27	28
28	29	30	31				18	19	20	21	22	23	24	29	30					
							25	26	27	28	29	30	31							





# Water Resources Data South Dakota Water Year 1985

by E.B. Hoffman, R.D. Benson, and G.R. Wisnieski



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT SD-85-1  
Prepared in cooperation with the State of South Dakota  
and with other agencies



UNITED STATES DEPARTMENT OF THE INTERIOR

DONALD PAUL HODEL, Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For information on the water program in South Dakota write to  
District Chief, Water Resources Division  
U.S. Geological Survey  
Room 317, Federal Building  
200 4th St. SW  
Huron, South Dakota 57350



## PREFACE

This volume of the annual hydrologic data report of South Dakota is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each state, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and water quality provide the hydrologic information needed by state, local, and federal agencies, and the private sector for developing and managing our Nation's land and water resources.

General direction for the series is by Phillip Cohen, Chief Hydrologist, U.S. Geological Survey, James F. Daniel, Assistant Chief Hydrologist for Scientific Information Management, and James F. Blakey, Regional Hydrologist, Central Region. This report was prepared by personnel of the South Dakota District of the Water Resources Division of the U.S. Geological Survey under the supervision of Richard E. Fidler, District Chief, and John R. Little, Chief, Hydrologic Data Collection and Analysis Section. Other South Dakota personnel who contributed significantly to the collecting, processing, and tabulating the data, and typing the manuscript were:

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R.D. Benson			

This report was prepared in cooperation with the State of South Dakota and other agencies.



REPORT DOCUMENTATION PAGE	1. REPORT NO. USGS/WRD/HD-86/265	2.	3. Recipient's Accession No.
4. Title and Subtitle  Water Resources Data South Dakota Water Year 1985			5. Report Date September 1986
7. Author(s) E. B. Hoffman, R. D. Benson, G. R. Wisnieski			8. Performing Organization Rept. No. USGS-WDR-SD-85-1
9. Performing Organization Name and Address U.S. Geological Survey, Water Resources Division Rm. 317, Federal Building 200 4th St. SW Huron, SD 57350			10. Project/Task/Work Unit No.
12. Sponsoring Organization Name and Address U.S. Geological Survey, Water Resources Division Rm. 317, Federal Building 200 4th St. SW Huron, SD 57350			11. Contract(C) or Grant(G) No.  (C)  (G)
15. Supplementary Notes  Prepared in cooperation with the State of South Dakota and with other agencies.			13. Type of Report & Period Covered Annual-Oct. 1, 1984 to Sept. 30, 1985
16. Abstract (Limit: 200 words)  Water Resources Data for the 1985 water year for South Dakota consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes and reservoirs; and water levels in wells. This report contains discharge records for 115 streamflow-gaging stations; stage and contents records for 10 lakes and reservoir, stage for 2 streams and 1 lake; water quality records for 30 stream-gaging stations, 3 wells, 5 ungaged stream sites, 4 lakes, and 4 sewage lagoons; and water levels for 30 observation wells. Additional water data were collected at various sites, not part of the systematic data-collection program, and are published as miscellaneous measurements and analyses. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State and Federal agencies in South Dakota.			
17. Document Analysis a. Descriptors  *South Dakota, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses.			
b. Identifiers/Open-Ended Terms			
c. COSATI Field/Group			
18. Availability Statement: No restriction on distribution This report may be purchased from: National Technical Information Service Springfield, VA 22161		19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 274
		20. Security Class (This Page) UNCLASSIFIED	22. Price



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[Letters after station name designate type of data: (d) discharge, (e) gage height, elevation, or contents, (c) chemical, (b) biological, (m) microbiological, (p) pesticide, (r) rainfall, (t) water temperature, (s) sediment]

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## WATER RESOURCES DATA - SOUTH DAKOTA, 1985

### INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of South Dakota each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - South Dakota."

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 115 streamflow-gaging stations; (2) stage and contents records for 10 lakes and reservoirs, stage for 2 streams and 1 lake; (3) water-quality records for 30 streamflow-gaging stations, 3 wells, 5 ungaged streamsites, 4 lakes, and 4 sewage lagoons.

This series of annual reports for South Dakota began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for South Dakota were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 6A and 6B." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from Distribution Branch, Text Products Section, U.S. Geological Survey, 604 South Pickett Street, Alexandria, VA 22304.

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report SD-85-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on back of title page.

### COOPERATION

The U.S. Geological Survey and agencies of the State of South Dakota have had cooperative agreements for the collection of surface-water records since 1914, for ground-water levels since 1935, and for water-quality since 1947. Organizations that assisted in collecting the data in this report through cooperative agreement with the Survey are: Department of Water and Natural Resources; Department of Transportation; East Dakota Water Development District; West Dakota Water Development District; Tennessee Valley Authority; EROS Data Center; State of Wyoming; City of Rapid City; and City of Watertown.

Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers; U.S. Department of Interior, Bureau of Indian Affairs; U.S. Department of Interior, Bureau of Reclamation; and the Missouri River basin development program for gaging and water-quality stations.

Organizations that supplied data are acknowledged in station descriptions.

### SUMMARY OF HYDROLOGIC CONDITIONS

by Rick D. Benson

Water year 1985 was a year of divergent precipitation patterns across South Dakota. During the fall, the western and central parts of the State experienced slightly less-than-normal precipitation while the east-central part received about 2.5 inches more than normal (table 1). The shortages persisted in the western two-thirds of the State through winter and spring. By the end of June, the Black Hills area had recorded 6.5 inches less than normal, and the livestock industry was suffering. Precipitation was greater than normal through June, however, in the east-central and southeast parts of the State. Less-than-normal precipitation continued into September in the west with the Black Hills recording 7.8 inches less than normal at the end of the year. Near-normal to greater-than-normal precipitation continued in the central and east, however, as precipitation averaged about 2.5 inches more than normal for the period. The east-central and southeastern parts of the State received about 5 inches more than normal precipitation for the year.



Precipitation data from published reports of the U.S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service, for the nine divisions in South Dakota are shown in table 1. The cumulative precipitation and departures from normal are shown for the end of each quarter.

Table 1.--Cumulative precipitation and departures from normal,<sup>1/</sup> in inches

National Weather Service Division <sup>2/</sup>	October-December		October-March		October-June		October-September	
	Precipitation	Departure from normal	Precipitation	Departure from normal	Precipitation	Departure from normal	Precipitation	Departure from normal
Northwest	2.06	+0.38	3.57	+0.42	8.79	-1.83	12.57	-2.71
North Central	1.73	-.27	3.52	-.17	8.14	-3.64	15.14	-2.19
Northeast	4.22	+1.74	6.29	+1.84	12.17	-.90	20.88	+1.28
Black Hills	2.36	-.31	4.31	-1.13	8.79	-6.49	13.50	-7.80
Southwest	1.34	-.22	3.02	-.56	6.66	-4.98	11.99	-4.63
Central	2.21	+.23	4.84	+1.09	9.89	-1.59	17.51	+.61
East Central	5.23	+2.45	8.15	+3.11	15.34	+1.46	26.68	+5.78
South Central	2.30	-.03	4.50	-.10	9.41	-4.33	18.85	-1.30
Southeast	4.86	+1.91	7.30	+1.74	17.60	+2.67	27.74	+4.67

<sup>1/</sup> Based on data from 1951 to 1980.

<sup>2/</sup> Shown in figure 1.

#### Surface Water

Reflecting the precipitation patterns, streamflow was significantly less than the long-term average in the western three-fourths of the State during the last one-half of the water year (fig. 1). Streams such as the Moreau and White Rivers with flows primarily consisting of surface runoff discharged 57 and 34 percent, respectively, of their long-term means during the year. Streams draining basins with storage capacity, such as Castle Creek, which derives most of its water from the Madison aquifer, and the James River, which is sustained by many natural and manmade surface reservoirs, had greater-than-normal flow early in the year and less-than-normal flow after spring runoff. The Big Sioux River, which drains the eastern part of the State and has excellent hydraulic connection with the Big Sioux aquifer, had greater-than-normal flow during the entire year. The Big Sioux River at Akron, Iowa, had a mean discharge of 982 cubic feet per second, which was 221 percent of the long-term average.

Maximum discharges at the five representative gaging stations also indicated the effects of the deficient precipitation (table 2). Castle Creek had a maximum discharge during the year of only 34 cubic feet per second, the White River had a maximum discharge of 5,780 cubic feet per second, and the Moreau River had a maximum discharge of 5,920 cubic feet per second. Peak discharges of these magnitudes can be expected at least once every 2 years.

Combined storage in the four Missouri River reservoirs (Lakes Oahe, Sharpe, Francis Case, and Lewis and Clark) was 23,090,000 acre-feet at the end of the water year, a decrease of 2,705,000 acre-feet from the same date a year ago.

#### Water Quality

Chemical quality of surface water in South Dakota varies considerably across the State. Mean monthly dissolved-solids concentrations for the period of record are compared to samples collected during the 1985 water year in figure 2. Of the 12 stations shown in figure 2, all are National stream-quality accounting network (NASQAN) stations except for two (Castle Creek above Deerfield Reservoir near Hill City and Little Vermillion River near Salem), which are hydrologic bench-mark stations. Dissolved-solids concentrations ranged from as little as 260 milligrams per liter at the Castle Creek above Deerfield Reservoir station to as much as 3,100 milligrams per liter at the Belle Fourche River near Elm Springs station.

Dissolved-solids concentrations in samples collected from Grand, Moreau, Cheyenne, and White Rivers were greater than the long-term averages. This probably was due to the concentration effect caused by the flows being less than normal. In contrast, the concentration of 410 milligrams per liter from the March sample collected from the James River near Scotland was less than normal, but the stream discharge was much greater than normal.

#### Ground Water

Water levels in wells, discharge of springs and wells, and the quality of water from wells are key characteristics in monitoring ground-water trends; however, these hydrologic characteristics need to be integrated with other measurements and ground-water-system studies in order to have the fullest meaning and usefulness. In South Dakota, the U.S. Geological Survey regularly monitors a number of observation wells. Other wells, which are known as project wells, are used for specific (generally short-term) studies and, although they are not part of the observation-well program, data obtained

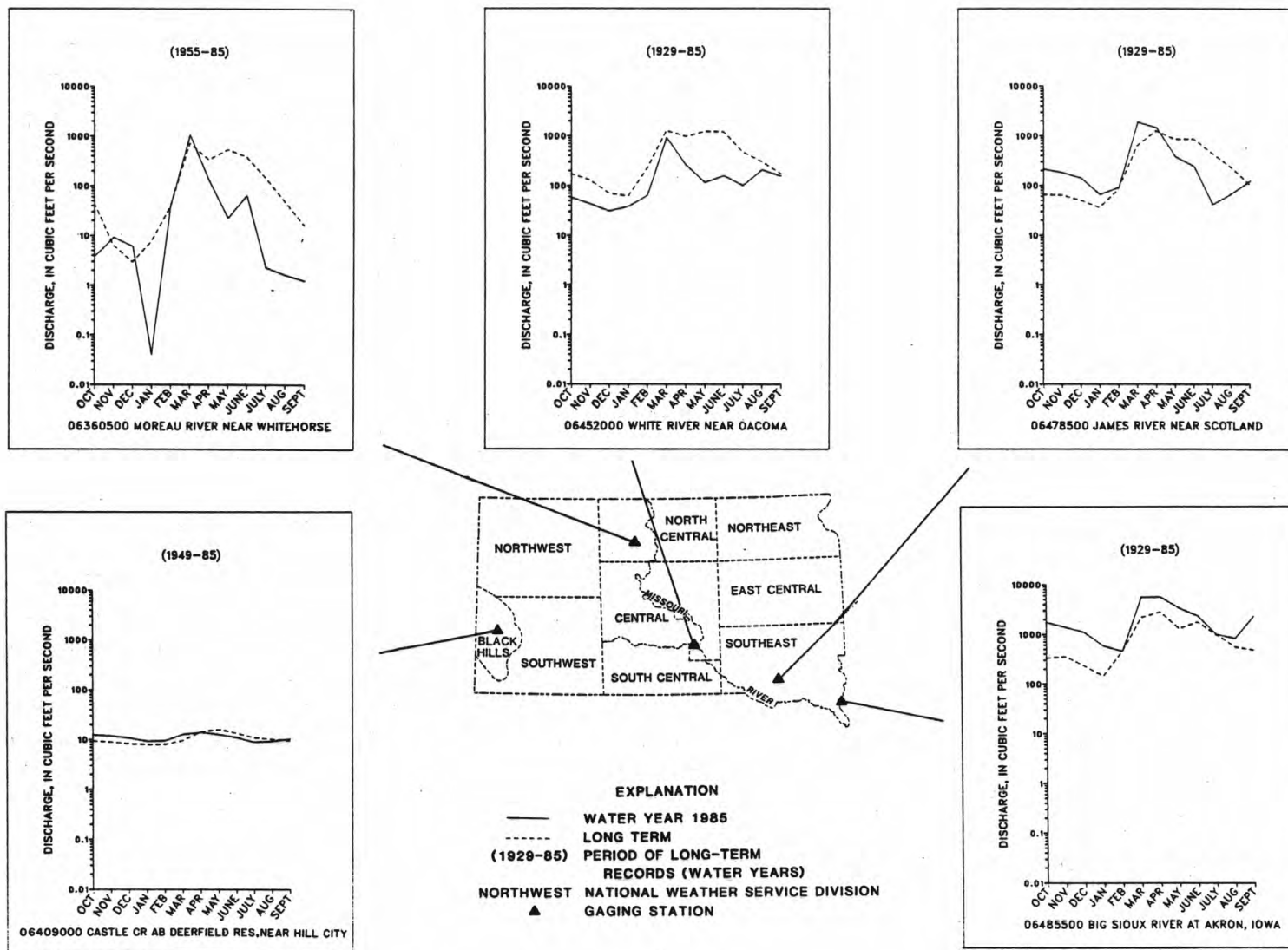


Figure 1.--Comparison of 1985 monthly mean to long-term monthly mean discharges.



Table 2.--Comparison of current-year maximum discharge to maximum for long-term periods  
[ft<sup>3</sup>/s, cubic feet per second]

Gaging-station number and name	Long-term period used (water years)	Peak discharges						
		1985 Water year			Long-term period			
		Peak (ft <sup>3</sup> /s)	Date	Return interval (years)	Peak (ft <sup>3</sup> /s)	Date	Return interval (years) <u>1</u> /	
06360500 Moreau River near Whitehorse	1955-85	5,920	3-21-85	2	27,700	5-24-82	28	
06409000 Castle Creek above Deerfield Reservoir, near Hill City	1948-85	34	3-25-85	<2	1,120	5-22-52	>100	
06452000 White River near Oacoma	1929-85	5,780	3-15-85	<2	51,900	3-30-52	>100	
06478500 James River near Scotland	1929-85	4,110	3-27-85	4	29,400	6-23-84	>100	
06485500 Big Sioux River at Akron, Iowa	1929-85	21,000	4-26-85	5	80,800	4- 9-69	>100	

1/ Long-term period through water year 1985.

Table 3.--Comparison of current-year minimum discharge to minimum for long-term periods  
[ft<sup>3</sup>/s, cubic feet per second]

Gaging-station number and name	Long-term period used (water years)	Minimum discharges						
		1985 Water year <u>1</u> /			Long-term period			
		1-day (ft <sup>3</sup> /s)	Date	Average 7-day (ft <sup>3</sup> /s)	1-day (ft <sup>3</sup> /s)	Date	7-day, 10-year (ft <sup>3</sup> /s) <u>1</u> /	
06360500 Moreau River near Whitehorse	1955-85	0.0	several days	0.0	0	many days	Not determined	
06409000 Castle Creek above Deerfield Reservoir, near Hill City	1948-85	6.0	1-31-85	7.1	2.0	several days	4.0	
06452000 White River near Oacoma	1929-85	22	12-24 thru 25-84	24	0	many days	3.6	
06478500 James River near Scotland	1929-85	30	2-11-85	32	0	many days	1.6	
06485500 Big Sioux River at Akron, Iowa	1929-85	290	2-6 thru 17-85	290	4.0	1-17-77	18.9	

1/ Low-flow water year is April 1 to March 31.

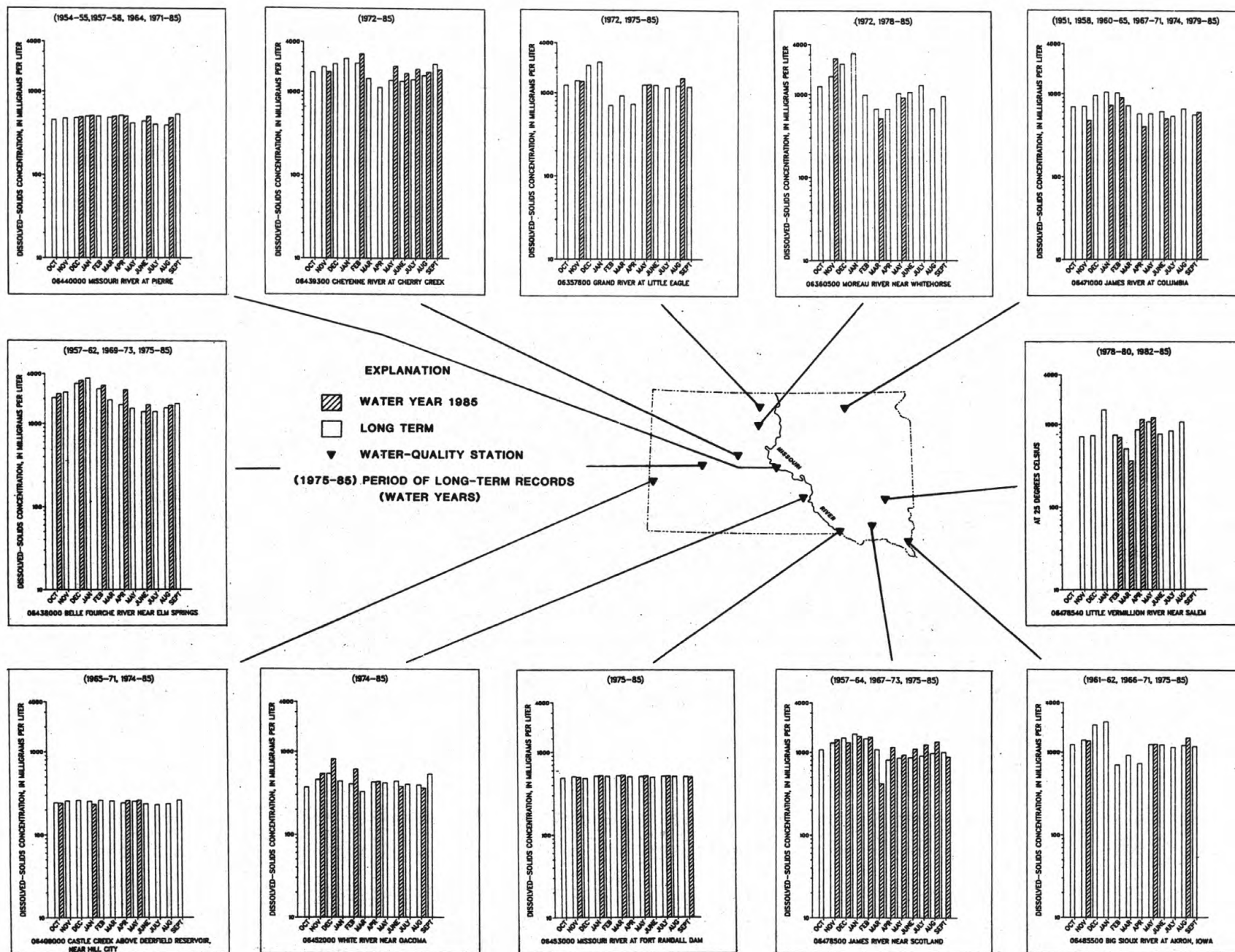


Figure 2.--Comparison of 1985 monthly dissolved-solids concentrations or specific conductance to the long-term average monthly values.

from them also are made available. The hydrographs in figure 3 are from six of the wells in the network. Water levels in the western part of the State were slightly lower in 1985 than in 1984. Ground-water withdrawal has resulted in a water-level decline in the Lincoln County well.

#### SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream-Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

#### EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1985 water year that began October 1, 1984, and ended September 30, 1985. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, water-quality data for surface and ground water, and ground-water-level data. The locations of the stations and wells where the data were collected are shown in figures 4 and 5. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

#### Station Identification Numbers

Each data station, whether streamsite or well, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The system used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water well sites differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in South Dakota, for surface-water stations where only miscellaneous measurements are made.

#### Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a main-stream station are listed before that station. A station on a tributary that enters between two main-stream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indentation in the "List of Stations" in the front of this report. Each indentation represents one rank. This downstream order and system of indentation show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations



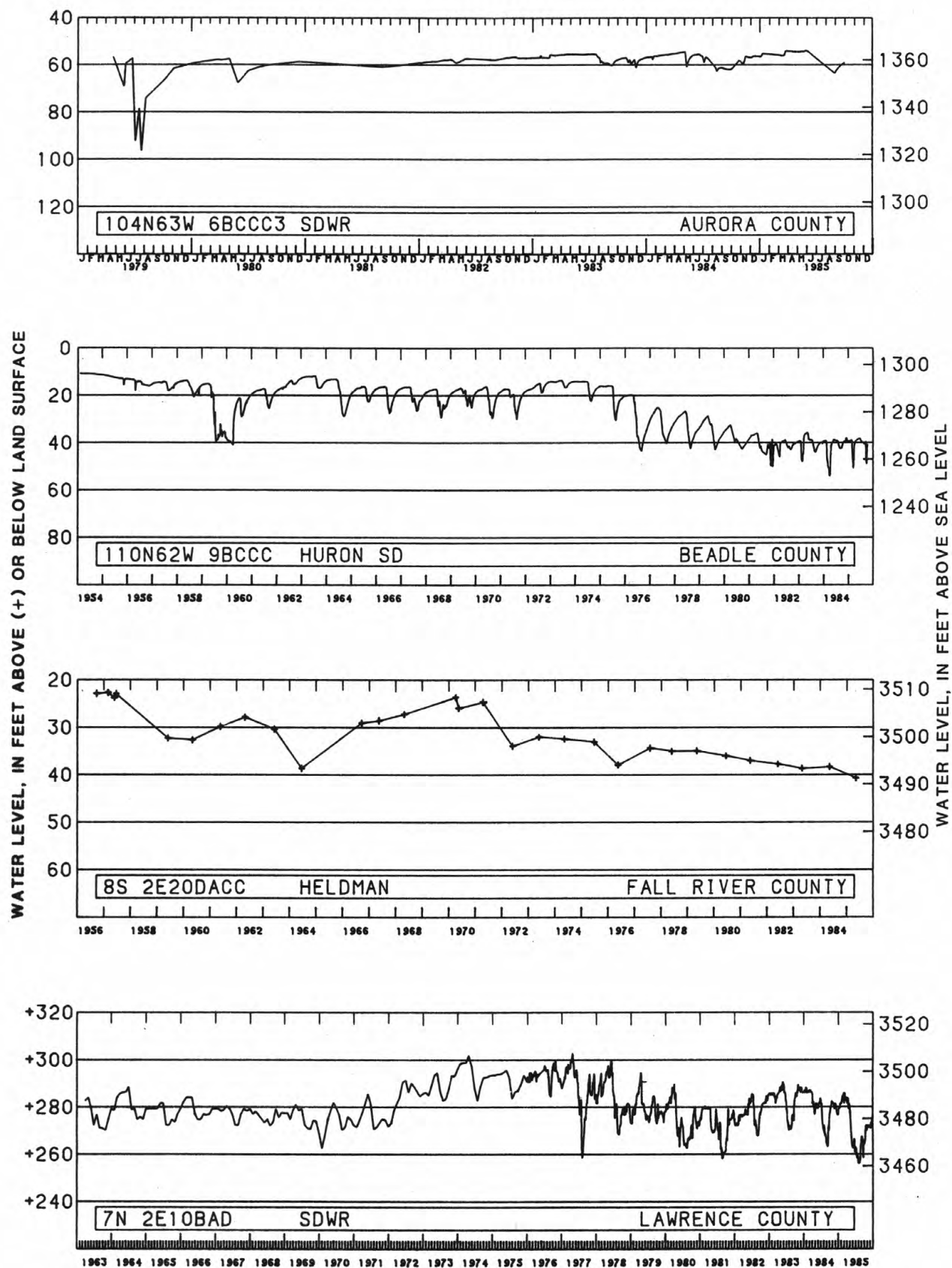


Figure 3.--Water levels from selected observation wells.

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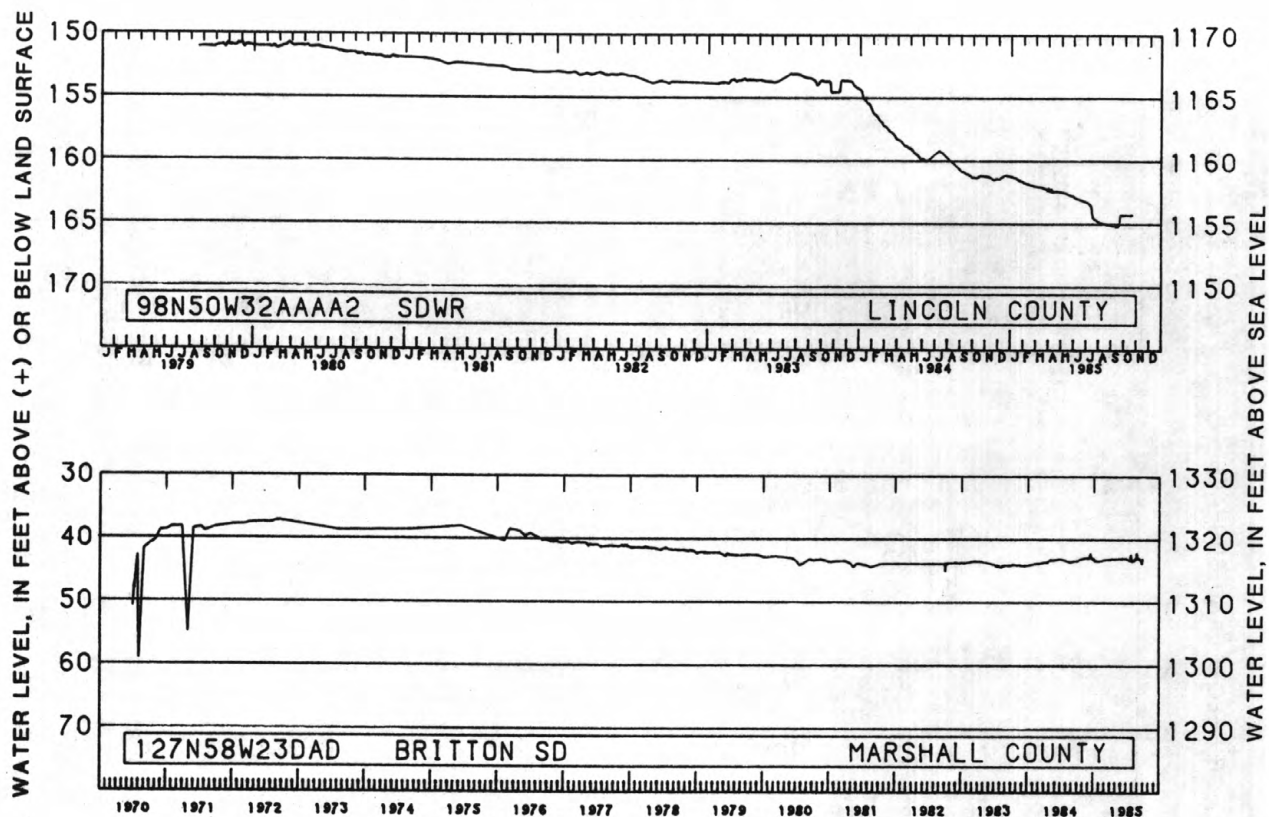
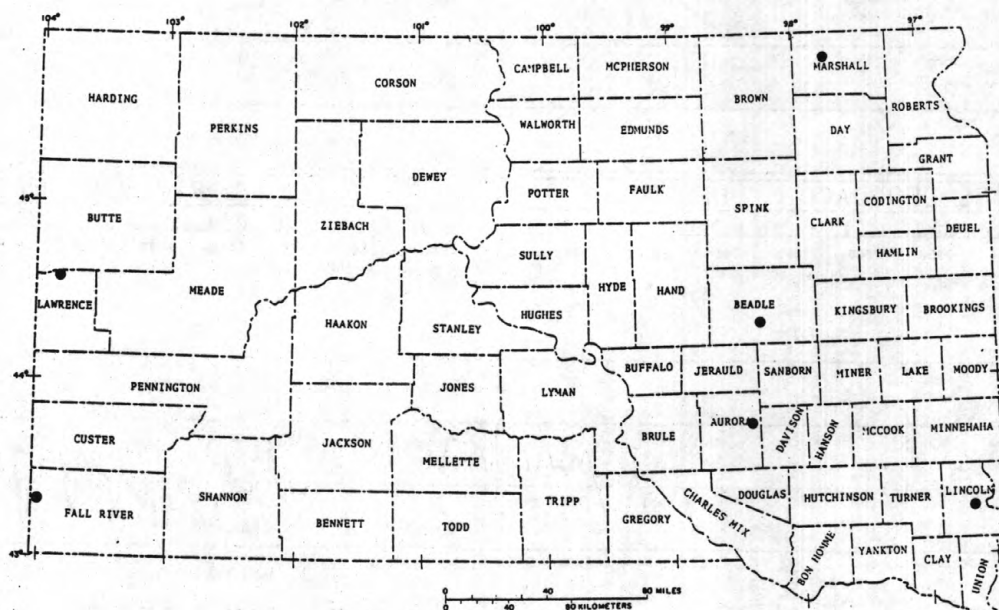


Figure 3.--Water levels from selected observation wells.--Continued

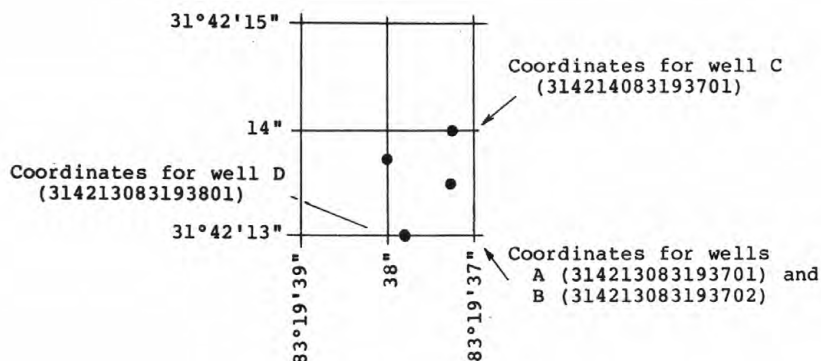


Map of South Dakota showing location of selected observation wells

that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 06442500, which appears just to the left of the station name, includes the two-digit Part number "06" plus the six-digit downstream-order number "442500." The Part number designates the major river basin; for example, part "06" is the Missouri River basin.

#### Latitude-Longitude System

The identification numbers for wells and miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a 1-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description. (See figure below.)



System for numbering wells and miscellaneous sites (latitude and longitude).

#### Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges commonly are published for such stations, they are referred to as "daily stations." By contrast, partial records are obtained through discrete measurements. The nature of the partial record is indicated by table title such as "Monthend elevation and contents."

#### Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relation between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relation between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.



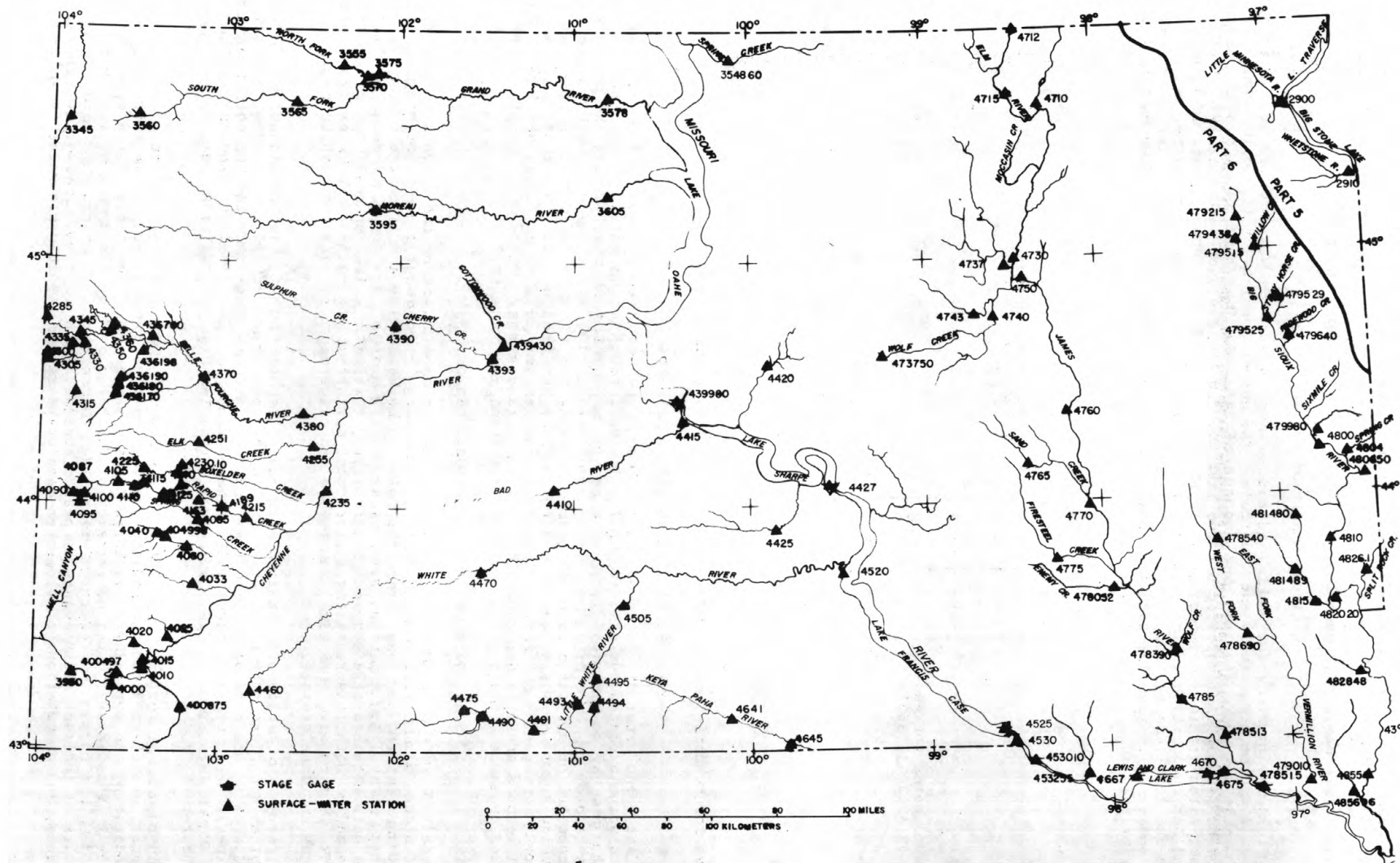


Figure 4. -- Map of South Dakota showing location of lake and stream gaging stations

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relation of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Even when this is done, the contents computed may become increasingly in error as time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relation much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

#### Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and the data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

**LOCATION.**--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

**DRAINAGE AREA.**--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

**PERIOD OF RECORD.**--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

**REVISED RECORD.**--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

**GAGE.**--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

**REMARKS.**--All periods of estimated daily-discharge record are identified by date in this paragraph of the station description for water-discharge stations. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development. The median of yearly mean discharges also is given under this heading for stations having 10 or more water years of record, if the median differs from the average given by more than 10 percent.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District office to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is expressed in acre-feet (line headed "AC-FT"). In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations daily observed discharges are adjusted for diversions. These stations are identified by a statement in the "Remarks" paragraph.

#### Accuracy of the Records

The accuracy of streamflow records depends primarily on: (1) The stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements; and (2) the accuracy of measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft<sup>3</sup>/s; to the nearest tenth between 1.0 and 10 ft<sup>3</sup>/s; to whole numbers between 10 and 1,000 ft<sup>3</sup>/s; and to 3 significant figures for more than 1,000 ft<sup>3</sup>/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. Evaporation from a reservoir is not included in the



adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

#### Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the South Dakota District office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the District office.

#### Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

#### Classification of records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be once or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 5.

#### Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

#### Onsite Measurements and Sample Collection

In obtaining water-quality data, a major objective is assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed on p. 25 and 26 of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey District office.

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 mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches

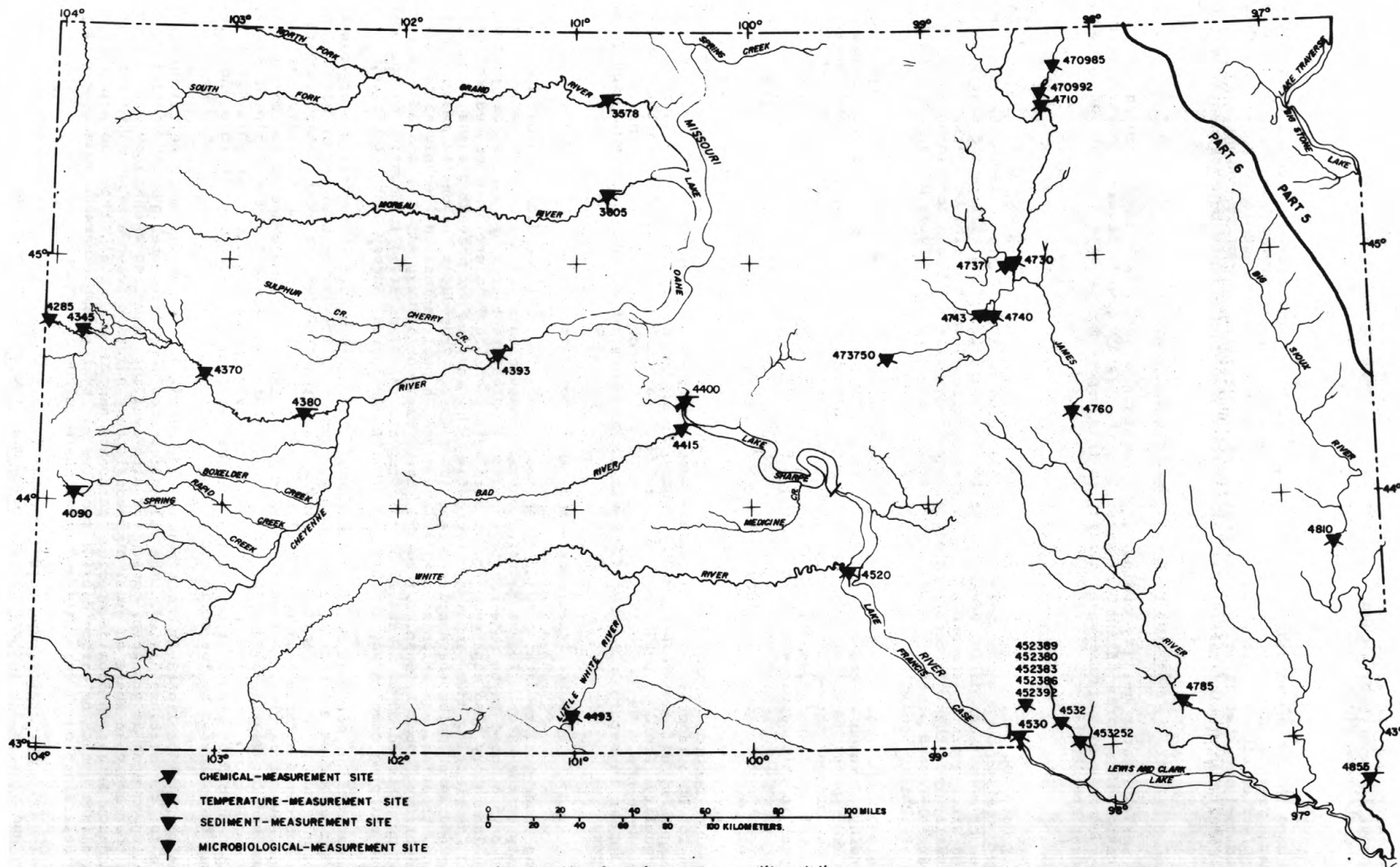


Figure 5. -- Map of South Dakota showing location of surface-water quality stations

beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S.G.S. District office whose address is given on the back of the title page of this report.

#### Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. 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 recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the District office.

#### 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 point and a coefficient applied to determine the mean 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 subdivided-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 subdivided-day method. For periods when no samples were collected, daily discharges 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 and in predicting long-term sediment-discharge characteristics of the stream.

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

#### Laboratory Measurements

Samples for indicator bacteria and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratories in Arvada, Colo. or Iowa City, Ia. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratories are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

#### Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.



COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

#### Remark Codes

The following remark codes may appear with the water-quality data in this report:

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant
TNTC	Too numerous to count

#### Records of Ground-Water Levels

Although, in this report, records of water levels are presented for 30 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several thousand observation wells throughout South Dakota and are placed in computer storage. Information about the availability of the data in the water-level file may be obtained from the District Chief, South Dakota District. (See address on back of front page.)

#### Data Collection and Computation

Measurements of water levels are made in many types of wells under varying conditions, but the methods of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Tables of water-level data are presented by counties arranged in alphabetical order. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, an alphanumeric number, derived from the township-range location of the well.

Water-level records are obtained from direct measurements with a steel tape or from the graph or punched tape of a water-stage recorder. The water-level measurements in this report are given in feet with reference to land-surface datum (lsd). Land-surface datum is a datum plane that is approximately at land surface at each well. If known, the elevation of the land-surface datum is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom).

Water levels are reported to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error of determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water, the accuracy is greater.

Accordingly, most measurements are reported to a hundredth of a foot, but some are given to a tenth of a foot.

#### Data Presentation

Each well record consists of two parts, the station description and the data table of water levels observed during the water year. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

**LOCATION.**--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic-unit number; the distance and direction from a geographic point of reference; and the owner's name.

**AQUIFER.**--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

**WELL CHARACTERISTICS.**--This entry describes the well in terms of depth, diameter, casing depth and/or screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

**INSTRUMENTATION.**--This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

**DATUM.**--This entry describes both the measuring point and the land-surface elevation at the well. The measuring point is described physically (such as top of collar, notch in top of casing, plug in pump base and so on), and in relation to land surface (such as 1.3 ft above land-surface datum). The elevation of the land-surface datum is described in feet above (or below) National Geodetic Vertical Datum of 1929 (NGVD of 1929); it is reported with a precision depending on the method of determination.

**PERIOD OF RECORD.**--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the Geological Survey, may be noted.

A table of water levels follows the station description for each well. Water levels are reported in feet below land-surface datum and all taped measurements of water level are listed. For wells equipped with recorders, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). The highest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

#### Records of Ground-Water Quality

Records of ground-water quality in this report differ from other types of records in that for most sampling sites they consist of only one set of measurements for the water year. The quality of ground water ordinarily changes only slowly; therefore, for most general purposes one annual sampling, or only a few samples taken at infrequent intervals during the year, is sufficient. Frequent measurement of the same constituents is not necessary unless one is concerned with a particular problem, such as monitoring for trends in nitrate concentration. In the special cases where the quality of ground water may change more rapidly, more frequent measurements are made to identify the nature of the changes.

#### Data Collection and Computation

The records of ground-water quality in this report were obtained as part of a special county study. As a result, the records for this year, by themselves, do not provide a balanced view of ground-water quality statewide. Such a view can be attained only by considering records for this year in context with similar records obtained for these and other counties in earlier years.

Most methods for collecting and analyzing water samples are described in the "U.S. Geological Survey Techniques of Water Resources Investigations" manuals listed on a following page. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

#### Data Presentation

The records of ground-water quality are published in a section titled QUALITY OF GROUND WATER. Data for quality of ground water are identified by well number. The prime identification number for wells sampled is the 15-digit number derived from the latitude-longitude locations. No descriptive statements are given for ground-water-quality records; however, the well number, date of sampling, and other pertinent data are given in the table containing the chemical analyses of the ground water.

The REMARK codes listed for surface-water-quality records are also applicable to ground-water-quality records.

#### ACCESS TO WATSTORE DATA

The National Water Data Storage and Retrieval System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at its National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from each of the Water Resources Division's District offices (see address given on the back of the title page).

General inquiries about WATSTORE may be directed to:

Chief Hydrologist  
U.S. Geological Survey  
437 National Center  
Reston, Virginia 22092

#### DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also the table for converting English units to International System of units (SI) on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important to the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer, tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C  $\pm$  1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestines or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5°C  $\pm$  0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed in number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in intestines of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as Gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C  $\pm$  1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.



Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area of volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter ( $\text{g/m}^3$ ), and periphyton and benthic organisms in grams per square meter ( $\text{g/m}^2$ ).

Dry mass refers to the mass of residue present after drying in an oven at 105°C for zooplankton and periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Cfs-day is the volume of water represented by flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons or 2,447 cubic meters.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic foot per second ( $\text{ft}^3/\text{s}$ ) 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 or 0.02832 cubic meters per second.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

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

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to that material in a representative water sample which passes through a 0.45  $\mu\text{m}$  membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

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 a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate ( $\text{CaCO}_3$ ).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Measuring point (MP) is an arbitrary permanent reference point from which the distance to the water surface in a well is measured to obtain the water level.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

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

Micrograms per gram ( $\mu\text{g/g}$ ) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter ( $\mu\text{g/L}$ ,  $\mu\text{g/L}$ ) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter ( $\text{MG/L}$ ,  $\text{mg/L}$ ) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in  $\text{mg/L}$  and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meters ( $\text{m}^2$ ), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and/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 a particle determined by either 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).

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

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
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 matter 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.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population in terms of types, numbers, mass, or volume.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth ( $1 \times 10^{-12}$ ) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields  $3.7 \times 10^{10}$  radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [ $\text{mg C}/(\text{m}^2 \cdot \text{time})$ ] for periphyton and macrophytes and [ $\text{mg C}/(\text{m}^3 \cdot \text{time})$ ] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [ $\text{mg O}_2/(\text{m}^2 \cdot \text{time})$ ] for periphyton and macrophytes and [ $\text{mg O}_2/(\text{m}^3 \cdot \text{time})$ ] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of only readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the



sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Sediment is solid material that originates mostly from disintegrated rocks and is transported 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 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.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge ( $\text{ft}^3/\text{s}$ ) x 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total-sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

7-day 10-year low flow ( $7 Q_{10}$ ) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).

Sodium-adsorption ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

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

Stage-discharge relation is the relation between gage height (stage) and volume of water per unit of time, flowing in a channel.

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" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45  $\mu$ m membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45  $\mu$ m membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....	Animal
Phylum.....	Arthropoda
Class.....	Insecta
Order.....	Ephemeroptera
Family.....	Ephemeridae
Genus.....	<u>Hexagenia</u>
Species.....	<u>Hexagenia limbata</u>

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

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 year.

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

Tons per day (T/DAY) is the quantity of substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses, because different digestion procedures are likely to produce different analytical results.

Turbidity (NTU) is based on the comparison of the intensity of light scattered by the sample under defined conditions with the intensity of light scattered by a standard reference suspension of Formazin polymer under the same conditions.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1985, is called the "1985 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

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.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.



The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Branch of Distribution, 604 South Pickett St., Alexandria, VA 22304 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 Pages.
- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. *Measurement of time of travel and dispersion in streams by dye tracing*, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.
- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

- 3-C1. *Fluvial sediment concepts* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 3-C2. *Field methods for measurement of fluvial sediment* by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 4-D1. *Computation of rate and volume of stream depletion by wells* by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
- 5-A1. *Methods for determination of inorganic substances in water and fluvial sediments* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.
- 5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.
- 5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
- 5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
- 7-C3. *A model for simulation of flow in singular and interconnected channels*, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. *Installation and service manual for U.S. Geological Survey manometers* by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

## 06334500 LITTLE MISSOURI RIVER AT CAMP CROOK, SD

LOCATION.--Lat 45°32'49", long 103°58'23", in SW¼ sec.2, T.18 N., R.1 E., Harding County, Hydrologic Unit 10110201, on left bank 15 ft upstream from bridge on State Highway 20 at east edge of Camp Crook.

DRAINAGE AREA.--1,970 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--September 1903 to November 1906, May 1956 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1904. WSP 1729: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3,108.98 ft above National Geodetic Vertical Datum of 1929. Sept. 2, 1903, to Nov. 30, 1906, nonrecording gage at site 0.5 mi upstream at different datum. May 1956 to Oct. 8, 1957, nonrecording gage at site 15 ft downstream, and Oct. 9, 1957, to Sept. 30, 1976, water-stage recorder at present site both at datum 2.00 ft higher.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 16 to Mar. 18, which are poor. Small diversions upstream from station for irrigation. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--32 years, 133 ft<sup>3</sup>/s (96,360 acre-ft/yr); median of yearly mean discharges, 120 ft<sup>3</sup>/s (86,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,420 ft<sup>3</sup>/s Mar. 24, 1978 (gage height, 16.90 ft), present datum; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1952 reached a stage of about 18 ft, present datum, from local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 19	unknown	*3,660	*a12.80	No other peak greater than base discharge.			

a From floodmarks.

Minimum daily discharge, 0.20 ft<sup>3</sup>/s Jan. 31 to Feb. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	8.1	8.0	5.5	.20	6.5	159	20	7.6	5.1	4.0	1.3
2	18	9.6	7.5	6.0	.20	6.5	151	20	11	5.1	7.1	1.3
3	18	10	7.0	7.0	.30	6.0	132	19	14	4.5	4.5	1.1
4	15	10	6.5	7.5	.30	6.0	131	18	12	4.3	3.6	1.1
5	14	9.5	6.6	8.0	.30	5.5	103	17	12	4.8	2.9	1.0
6	20	9.3	6.6	7.5	.40	6.0	87	16	10	3.1	2.1	.93
7	16	10	7.5	6.5	.40	6.5	79	17	8.1	3.0	2.1	.93
8	12	9.7	12	6.0	.50	7.0	77	18	8.2	3.2	2.3	.95
9	9.9	11	11	5.5	.50	7.0	70	17	8.8	2.9	2.2	1.1
10	9.1	11	11	5.0	.60	7.5	64	17	8.7	2.2	1.7	.97
11	7.8	11	11	4.0	.70	8.0	65	18	9.1	2.5	1.8	2.2
12	7.4	11	10	4.5	.70	10	61	18	8.6	1.5	1.9	3.6
13	6.9	13	9.0	5.0	.80	15	56	15	7.8	1.7	1.7	2.4
14	6.2	17	10	5.5	1.0	20	52	15	7.7	1.7	1.7	1.6
15	5.9	14	10	5.0	1.5	30	50	15	6.4	1.7	1.7	1.5
16	6.0	14	9.0	4.5	2.0	100	45	15	5.6	1.7	1.5	1.3
17	7.5	13	7.0	4.0	2.5	400	42	15	6.2	2.0	1.5	1.3
18	5.6	12	6.0	3.5	3.0	2000	38	15	6.7	2.5	1.5	1.0
19	5.5	12	6.0	3.0	3.5	3500	37	15	6.7	2.5	1.5	2.4
20	5.5	11	7.0	3.0	4.0	3200	39	17	5.9	2.4	1.4	6.7
21	10	11	8.0	3.5	4.0	2300	34	13	8.8	2.1	1.7	5.9
22	12	11	8.0	4.0	4.5	1580	31	13	13	1.5	1.7	3.6
23	12	12	7.0	4.5	4.5	1290	29	12	10	1.3	1.7	2.9
24	13	13	6.0	4.8	5.0	1040	27	11	7.6	1.3	1.5	2.9
25	14	13	6.5	4.8	5.0	821	26	8.9	7.2	1.3	1.3	3.1
26	14	12	7.0	4.5	4.5	585	25	12	5.9	1.1	1.1	2.7
27	12	11	8.0	3.5	6.0	389	24	15	4.0	1.1	1.1	3.8
28	10	10	7.0	2.0	7.0	334	23	15	4.2	1.1	1.1	3.9
29	11	10	6.5	1.0	---	272	22	25	4.7	1.3	1.2	3.2
30	9.4	9.0	6.0	.30	---	210	20	16	5.5	1.7	1.3	3.0
31	11	---	5.5	.20	---	188	---	12	---	3.2	1.3	---
TOTAL	332.2	338.2	244.2	139.60	63.90	18356.5	1799	489.9	242.0	75.4	63.7	69.68
MEAN	10.7	11.3	7.88	4.50	2.28	592	60.0	15.8	8.07	2.43	2.05	2.32
MAX	20	17	12	8.0	7.0	3500	159	25	14	5.1	7.1	6.7
MIN	5.5	8.1	5.5	.20	.20	5.5	20	8.9	4.0	1.1	1.1	.93
AC-FT	65	671	484	277	127	36410	3570	972	480	150	126	138
CAL YR 1984	TOTAL	43803.60		MEAN	120	MAX	2410	MIN	.90	AC-FT	86880	
WTR YR 1985	TOTAL	22214.28		MEAN	60.9	MAX	3500	MIN	.20	AC-FT	44060	



## MISSOURI RIVER MAIN STEM

## 06342500 MISSOURI RIVER AT BISMARCK, ND

LOCATION.--Lat 46°48'51", long 100°49'12", in SE¼NW¼SE¼ sec.31, T.139 N., R.80 W., Burleigh County, Hydrologic Unit 10130101, on left bank 40 ft upstream from Bismarck city waterplant, 2,100 ft downstream from Burlington Northern Railway bridge, 1.6 mi northwest of Bismarck Post Office, 3.5 mi upstream from Heart River, and at mile 1,314.5.

DRAINAGE AREA.--186,400 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October to November 1927, April 1928 to current year. See WSP 1729 or 1917 for history of data prior to April 1928.

GAGE.--Water-stage recorder. Datum of gage is 1,618.28 ft, revised, above National Geodetic Vertical Datum of 1929. See WSP 1729 or 1917 for history of changes prior to Sept. 30, 1937.

REMARKS.--Records good. Many diversions from tributaries. Flow regulated by Lake Sakakawea (station 06338000) 75.4 mi upstream since November 1953. Several observations of water temperature and specific conductance were made during the year and are available in files of Bismarck District office.

AVERAGE DISCHARGE.--57 years (1928-85), 22,750 ft<sup>3</sup>/s, 16,480,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 500,000 ft<sup>3</sup>/s, Apr. 6, 1952, gage height, 27.90 ft. Since completion of Garrison Dam in 1953, maximum discharge, 68,900 ft<sup>3</sup>/s, July 13, 1975, gage height, 14.24 ft; maximum gage height, 14.58 ft, Dec. 18, 1979, backwater from ice. Minimum discharge, about 1,800 ft<sup>3</sup>/s, Jan. 3, 1940; minimum gage height, 1.35 ft, Sept. 4, 1934, present site and datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 31.6 ft, Mar. 31, 1881, present site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 34,000 ft<sup>3</sup>/s, Feb. 3, backwater from ice; maximum gage height, 13.50 ft, Dec. 21, backwater from ice; minimum daily, 17,800 ft<sup>3</sup>/s, Sept. 8, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25400	27500	25500	23300	32700	24400	21900	18600	22800	22700	21600	20800
2	25600	26300	29400	23500	33800	24300	22000	18300	22600	23600	21700	20400
3	25400	26400	28800	24200	33800	21900	22000	18400	23400	22900	22100	20700
4	25700	27100	27600	24500	33200	22400	21700	19100	24900	23000	20700	20900
5	25400	27200	28500	24600	33100	20100	22500	18600	23000	22900	21400	20600
6	25400	28200	28400	24600	33400	20400	22200	18100	24000	23200	20000	20700
7	25600	28700	23100	24000	33400	19600	21800	18000	24100	22200	20800	19100
8	25200	28500	21200	25100	33700	19700	21200	18900	24100	21400	20900	17800
9	25700	28900	21000	25800	33800	19700	21300	20700	24600	21500	20900	18100
10	26100	29400	20500	26100	33500	20100	21100	21100	23100	21700	20800	18000
11	25600	28900	21400	27300	33300	20500	21200	21600	22800	21700	19800	18100
12	25900	28600	23400	27800	33000	21000	21300	22600	23200	21800	21600	22300
13	25600	28600	24900	27900	30900	23000	21500	22900	21600	22200	20500	23000
14	25800	28700	24700	28500	30600	25000	20900	23800	22500	21800	20700	17800
15	25400	28200	21500	27800	30800	25000	21600	22800	24400	21500	20300	18100
16	26300	27200	21200	28000	30900	23000	20200	22700	22200	21500	21800	17900
17	25600	27500	21300	28500	30700	22500	21300	23200	24900	21600	21100	18000
18	25600	27600	21200	28400	30500	23300	21400	21600	23600	22600	20400	22300
19	25600	27800	21000	29100	30700	23000	20000	22400	23000	22000	20300	23700
20	25400	27800	22100	29600	30800	23700	20000	21800	22800	21500	21100	20300
21	24800	27800	21800	30000	30500	23100	19600	21500	23400	20200	20700	18200
22	25300	27900	22900	29500	31100	23500	19400	21400	23700	21500	20600	18300
23	26600	27100	22300	30300	30500	23200	20100	22100	22900	21500	20900	18000
24	26600	26900	21900	30700	30800	22100	19500	21500	22400	22000	20500	18000
25	26900	27600	22500	30600	29200	22400	19200	22500	22800	21800	20500	18000
26	26900	26600	22800	30700	28900	22800	19600	22500	23500	21600	20500	18300
27	27000	27600	22000	31400	27200	21900	19000	22100	22400	22000	20700	18100
28	26500	27500	22500	30800	26900	22200	18800	22500	23100	22800	20600	18400
29	25900	27300	22800	31000	---	22800	18400	23000	22200	21900	20500	17900
30	26500	25400	23200	31700	---	21300	19000	23400	20900	22300	20400	18500
31	26500	---	23300	32100	---	21200	---	23300	---	21900	20700	---
TOTAL	801800	830800	724700	867400	881700	689100	619700	661000	694900	682800	645100	580300
MEAN	25860	27690	23380	27980	31490	22230	20660	21320	23160	22030	20810	19340
MAX	27000	29400	29400	32100	33800	25000	22500	23800	24900	23600	22100	23700
MIN	24800	25400	20500	23300	26900	19600	18400	18000	20900	20200	19800	17800
AC-FT	1590000	1648000	1437000	1720000	1749000	1367000	1229000	1311000	1378000	1354000	1280000	1151000
CAL YR 1984	TOTAL	8786500		MEAN	24010	MAX	31000	MIN	13900	AC-FT	17428000	
WTR YR 1985	TOTAL	8679300		MEAN	23780	MAX	33800	MIN	17800	AC-FT	17215000	

SPRING CREEK BASIN

29

06354860 SPRING CREEK NEAR HERREID, SD

LOCATION.--Lat 45°48'52", long 100°06'28", in SW¼ sec.13, T.127 N., R.77 W., Campbell County, Hydrologic Unit 10130102, on left bank 0.5 mi upstream from county highway bridge, 2.4 mi southwest of Herreid, and 13.2 mi upstream from high-water line of Lake Oahe.

DRAINAGE AREA.--440 mi<sup>2</sup>, approximately, of which about 220 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,653.80 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--23 years, 8.36 ft<sup>3</sup>/s (6,060 acre-ft/yr); median of yearly mean discharges, 3.3 ft<sup>3</sup>/s (2,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,340 ft<sup>3</sup>/s Mar. 29, 1978 (gage height, 11.49 ft); maximum gage height, 11.60 ft Mar. 17, 1966; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	1830	*88	*5.90	No other peak greater than base discharge.			
No flow for many days.							

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Stage-discharge relation affected by ice Mar. 12-14)

3.1	0	3.6	3.9	5.0	38
3.2	.45	4.0	10	5.5	60
3.4	1.8	4.5	22	6.0	91

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	2.8	.06	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	2.3	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	2.1	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	1.8	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	1.5	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	1.4	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.89	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.85	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	7.4	.71	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	10	.57	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	15	.54	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	27	.46	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	62	.35	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	71	.32	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	67	.24	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	47	.25	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	37	.47	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	31	.76	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	25	.80	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	20	.80	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	16	.61	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	12	.43	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	9.6	.40	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	7.8	.27	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	6.5	.19	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	5.3	.13	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	3.8	.09	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	3.1	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	483.50	25.93	.06	.00	.00	.00	.00
MEAN	.00	.00	.00	.00	.00	15.6	.86	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	71	2.8	.06	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	.00	959	51	.1	.00	.00	.00	.00
CAL YR 1984	TOTAL	3003.84		MEAN	8.21	MAX	319	MIN	.00	AC-FT	5960	
WTR YR 1985	TOTAL	509.49		MEAN	1.40	MAX	71	MIN	.00	AC-FT	1010	

## OAK CREEK BASIN

06354882 OAK CREEK NEAR WAKPALA, SD

LOCATION.--Lat 45°42'43", long 100°33'32", in SW¼SE¼NW¼ sec.9, T.20 N., R.29 E., Corson County, Hydrologic Unit 10130102, on right bank at upstream side of bridge on farm access road, 1.6 mi east of Rattlesnake Butte, and 4.0 mi northwest of Wakpala.

DRAINAGE AREA.--356 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1984 to Sept. 30, 1985.

GAGE.--Water-stage recorder. Elevation of gage is 1,690 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Nov. 8 to Mar. 16, and those for periods of backwater from beaver dam, Apr. 20 to July 24 and Aug. 22 to Sept. 30, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,320 ft<sup>3</sup>/s Mar. 18, 1985 (gage height, 11.84 ft); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 18	2330	*1,320	*11.84	No other peak greater than base discharge.			

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.45	.30	.00	.00	6.2	3.3	.08	.00	.00	1.6
2	.00	.00	.45	.35	.00	.00	5.3	3.2	.10	.00	.00	1.3
3	.00	.00	.40	.40	.00	.00	4.1	2.8	.10	.00	.00	1.0
4	.00	.00	.35	.50	.00	.00	4.4	2.8	.10	.00	.00	.90
5	.00	.00	.34	.60	.00	.00	4.2	2.6	.11	.00	.00	.82
6	.00	.00	.35	.60	.00	.00	4.0	2.0	.11	.00	.00	.72
7	.00	.64	.40	.65	.00	.00	3.8	1.9	.12	.00	.00	.65
8	.00	.85	.45	.65	.00	.00	5.2	1.7	.13	.00	.00	.52
9	.00	.75	.45	.60	.00	.00	4.3	1.6	.13	.00	.00	.44
10	.00	.65	.42	.60	.00	.10	3.8	1.6	.15	.00	.00	.36
11	.00	.65	.40	.55	.00	.35	3.3	1.7	.14	.00	.00	.30
12	.00	.70	.40	.45	.00	.80	3.0	1.6	.12	.00	.00	14
13	.00	.70	.40	.35	.00	1.3	2.8	1.2	.12	.00	.00	2.9
14	.00	.67	.38	.25	.00	10	2.6	1.0	.10	.00	.00	1.5
15	.00	.65	.35	.20	.00	150	2.3	1.0	.10	.00	.00	1.5
16	.00	.65	.33	.15	.00	500	2.1	.90	.08	.00	.00	1.1
17	.00	.60	.30	.10	.00	1030	2.1	.80	.06	.00	.00	.79
18	.00	.60	.30	.05	.00	1200	2.2	.65	.04	.00	.00	.60
19	.00	.60	.33	.02	.00	879	1.9	.50	.03	.00	.00	.50
20	.00	.65	.33	.00	.00	398	2.0	.40	.02	.00	.00	.33
21	.00	.65	.33	.00	.00	186	2.0	.30	.01	.00	.00	.21
22	.00	.70	.30	.00	.00	130	2.0	.25	.00	.00	63	.13
23	.00	.65	.30	.00	.00	81	2.1	.20	.00	.00	57	.05
24	.00	.60	.30	.00	.00	50	2.2	.15	.00	.00	27	.01
25	.00	.60	.32	.00	.00	35	2.4	.15	.00	.00	15	.00
26	.00	.55	.32	.00	.00	25	2.5	.12	.00	.00	8.5	.00
27	.00	.55	.32	.00	.00	17	2.7	.10	.00	.00	4.2	.00
28	.00	.50	.30	.00	.00	14	3.0	.09	.00	.00	2.8	.00
29	.00	.50	.28	.00	---	11	3.0	.08	.00	.00	1.9	.00
30	.00	.50	.28	.00	---	8.4	3.2	.07	.00	.00	2.1	.00
31	.00	---	.30	.00	---	7.6	---	.07	---	.00	1.8	---
TOTAL	.00	15.16	10.93	7.37	.00	4734.55	94.7	34.83	1.95	.00	183.30	32.23
MEAN	.00	.51	.35	.24	.00	153	3.16	1.12	.06	.00	5.91	1.07
MAX	.00	.85	.45	.65	.00	1200	6.2	3.3	.15	.00	63	14
MIN	.00	.00	.28	.00	.00	.00	1.9	.07	.00	.00	.00	.00
AC-FT	.0	30	22	15	.00	9390	188	69	3.9	.00	364	64
WTR YR 1985	TOTAL	5115.02		MEAN	14.0	MAX	1200	MIN	.00	AC-FT	10150	



## GRAND RIVER BASIN

31

## 06355000 NORTH FORK GRAND RIVER AT HALEY, ND

LOCATION.--Lat 45°57'39", long 103°07'09", at southwest corner of sec.30, T.129 N., R.99 W., Bowman County, Hydrologic Unit 10130301, on left bank 10 ft downstream from county highway bridge, 300 ft south of post office at Haley, and 1 mi north of South Dakota State line.

DRAINAGE AREA.--509 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1908 to September 1917, October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS (WATER YEARS).--WSP 1239: 1908-10, 1913-15(M), 1917(M).

GAGE.--Water-stage recorder. Datum of gage is 2,658.60 ft above National Geodetic Vertical Datum of 1929. Oct. 23, 1945, to June 18, 1951, nonrecording gage on downstream side of bridge near left abutment at present datum. See WSP 1729 or 1917 for history of changes prior to Oct. 23, 1945.

REMARKS.--Estimated daily discharges: Oct. 1 to Mar. 23 and Aug. 9 to Sept. 30. Records poor. Flow regulated since August 1966 by Bowman-Haley Lake (station 06354988) 8 mi upstream.

AVERAGE DISCHARGE.--49 years, 27.3 ft<sup>3</sup>/s, 19,800 acre-ft/yr; median of yearly mean discharges, 21 ft<sup>3</sup>/s, 15,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,100 ft<sup>3</sup>/s, Apr. 7, 1952, gage height, 17.03 ft, from rating curve extended above 4,500 ft<sup>3</sup>/s on basis of discharge measurement at gage height, 15.09 ft, half of which was indirect measurement of flow over roadway outside of main channel; maximum gage height, 17.10 ft, Apr. 15, 1950; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, about 120 ft<sup>3</sup>/s, Mar. 20, gage height, 6.98 ft, backwater from ice; maximum gage height, Mar. 19, gage height, 7.08 ft, Mar. 19, backwater from ice; minimum daily discharge, 0.17 ft<sup>3</sup>/s, Aug. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.67	1.6	.80	.40	.35	.70	35	3.7	1.5	.60	.76	1.1
2	.52	1.5	.80	.40	.30	.65	33	3.4	1.5	.60	.76	1.1
3	.40	1.6	.80	.40	.30	.60	29	2.9	1.6	.60	.76	1.1
4	.31	1.5	.80	.45	.35	.55	28	2.7	1.6	.52	.76	1.1
5	.24	1.6	.80	.50	.35	.50	27	2.7	1.6	.49	.60	1.1
6	.26	1.5	.85	.50	.35	.50	27	6.3	1.6	.49	.49	1.1
7	.34	1.5	1.0	.45	.35	.50	23	4.3	1.3	.45	.49	1.1
8	.42	1.5	1.0	.45	.35	.70	21	2.9	1.1	.31	.49	1.1
9	.50	1.5	1.0	.40	.35	2.0	19	2.8	1.2	.32	.49	1.1
10	.58	1.5	1.0	.40	.35	4.0	19	2.0	1.3	.36	.49	1.1
11	.66	1.5	.90	.40	.35	6.0	18	2.1	1.1	.39	.49	1.1
12	.77	1.5	.85	.40	.35	8.0	17	2.9	1.8	.39	.60	1.1
13	.95	1.5	.85	.40	.35	9.0	18	4.0	1.3	.36	.76	1.1
14	1.1	1.5	.85	.40	.35	7.0	15	4.5	1.3	.31	.76	1.1
15	1.2	1.6	.85	.40	.35	6.0	13	4.6	1.3	.31	.76	1.1
16	1.3	1.5	.85	.42	.35	5.0	13	3.4	1.2	.31	.76	1.1
17	1.4	2.0	.85	.42	.35	4.0	13	2.7	1.1	.27	.76	1.1
18	1.5	1.6	.85	.45	1.0	3.5	12	2.6	1.1	.42	.76	1.1
19	1.5	1.3	.85	.40	1.5	5.0	12	2.0	1.1	.49	.76	1.1
20	1.7	1.1	.85	.35	2.0	20	11	1.4	1.0	.49	.76	1.3
21	1.8	1.0	.85	.35	3.0	90	11	1.0	1.0	.49	.76	1.3
22	1.8	1.2	.80	.35	2.5	85	9.0	.97	1.0	.40	.94	1.3
23	1.8	1.1	.75	.35	1.8	80	8.1	1.1	.97	.31	2.0	1.3
24	1.8	1.0	.75	.35	2.0	76	8.1	1.1	.94	.31	2.2	1.5
25	1.8	1.0	.70	.35	1.5	70	13	1.1	.94	.24	2.0	1.6
26	1.8	1.0	.65	.35	1.0	65	7.8	1.1	.94	.21	1.8	1.6
27	1.8	1.0	.60	.35	.75	58	4.9	1.3	.78	.19	1.6	1.6
28	1.8	1.0	.55	.35	.75	54	6.6	1.3	.76	.17	1.1	1.6
29	1.8	.90	.50	.35	---	49	5.9	1.3	.76	.17	1.1	1.6
30	1.8	.80	.45	.35	---	43	3.7	1.4	.71	.49	1.1	1.6
31	1.5	---	.40	.35	---	39	---	1.3	---	.60	1.1	---
TOTAL	35.82	40.40	24.40	12.24	23.65	793.20	481.1	76.87	35.40	12.06	28.96	37.2
MEAN	1.16	1.35	.79	.39	.84	25.6	16.0	2.48	1.18	.39	.93	1.24
MAX	1.8	2.0	1.0	.50	3.0	90	35	6.3	1.8	.60	2.2	1.6
MIN	.24	.80	.40	.35	.30	.50	3.7	.97	.71	.17	.49	1.1
AC-FT	71	80	48	24	47	1570	954	152	70	24	57	74
CAL YR 1984	TOTAL	2156.96		MEAN	5.89	MAX	88	MIN	.24	AC-FT	4280	
WTR YR 1985	TOTAL	1601.30		MEAN	4.39	MAX	90	MIN	.17	AC-FT	3180	

## GRAND RIVER BASIN

06355500 NORTH FORK GRAND RIVER NEAR WHITE BUTTE, SD

LOCATION.--Lat 45°47'39", long 102°21'59", in NE¼SE¼ sec.10, T.21 N., R.14 E., Perkins County, Hydrologic Unit 10130301, on right bank 1,400 ft upstream from highway bridge and 9.8 mi south of White Butte.

DRAINAGE AREA.--1,190 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1279: 1947, 1950.

GAGE.--Water-stage recorder. Elevation of gage is 2,275 ft, by barometer. See WSP 1917 for history of changes prior to June 12, 1951. June 12, 1951, to Aug. 20, 1975, water-stage recorder, and Aug. 21 to Sept. 10, 1975, nonrecording gage at site 1,300 ft downstream; Sept. 11, 1975, to Mar. 22, 1976, nonrecording gage at present site, and Mar. 23 to July 28, 1976, nonrecording gage at site 1,400 ft downstream, all at present datum.

REMARKS.--Records good except those for winter periods, Nov. 1, 2 and Nov. 10 to Mar. 11, which are poor. Flow regulated by Bowman-Haley Dam, capacity, 93,000 acre-ft, 71 mi upstream, beginning August 1966. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--40 years, 54.0 ft<sup>3</sup>/s (39,120 acre-ft/yr); median of yearly mean discharges, 32 ft<sup>3</sup>/s (23,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,900 ft<sup>3</sup>/s Apr. 16, 1950 (gage height, 20.0 ft), from floodmarks, from rating curve extended above 19,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,200 ft<sup>3</sup>/s (time unknown), Mar. 17 (gage height, 8.10 ft, back-water from ice); no flow Jan. 30 to Feb. 10, July 21 to Aug. 21.

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Stage-discharge relation affected by ice Nov. 1, 2, Nov. 10 to Mar. 17;  
shifting-control method used Mar. 18-24, Apr. 16 to May 20)

1.6	0	2.2	15	4.0	295
1.7	.24	2.4	31	5.0	615
1.8	.74	2.7	62	6.0	1,080
1.9	1.8	3.0	102	7.0	1,690
2.0	4.8	3.5	185		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.31	2.5	2.5	2.6	.00	1.0	72	23	8.9	3.8	.00	5.5
2	3.7	3.0	2.5	2.9	.00	.95	79	21	9.8	3.2	.00	5.0
3	3.9	3.8	2.4	3.4	.00	.90	72	18	9.9	2.8	.00	4.7
4	3.5	3.7	2.4	3.5	.00	.90	69	18	9.4	2.7	.00	4.1
5	2.9	3.9	2.4	3.6	.00	.90	67	16	8.2	2.3	.00	3.2
6	3.6	4.2	2.1	3.7	.00	1.0	63	15	7.2	1.6	.00	2.7
7	3.7	4.4	2.2	3.5	.00	1.0	59	14	7.2	1.2	.00	2.0
8	4.4	4.4	2.4	3.5	.00	1.1	56	13	7.2	.97	.00	1.6
9	18	3.2	2.7	3.4	.00	1.3	54	10	6.9	.80	.00	1.5
10	20	2.5	2.6	3.3	.00	1.5	52	11	6.3	.67	.00	1.4
11	12	2.5	2.4	3.0	.10	2.0	49	16	5.1	.54	.00	1.4
12	4.5	2.7	2.3	3.2	.25	2.5	46	20	5.4	.48	.00	2.0
13	2.2	2.5	2.3	3.3	.35	3.6	45	18	5.0	.36	.00	2.0
14	2.4	2.4	2.4	3.2	.45	10	43	19	4.4	.64	.00	1.8
15	2.5	2.4	2.5	3.3	.55	45	41	17	3.7	.40	.00	1.6
16	2.7	2.3	2.2	3.3	.70	150	40	14	3.5	.28	.00	1.6
17	2.8	2.3	1.9	3.0	.75	1400	38	12	2.8	.27	.00	1.5
18	2.9	2.2	1.5	2.5	.80	1460	35	12	2.3	.25	.00	1.3
19	2.9	2.3	1.7	1.1	.85	441	35	12	2.0	.06	.00	1.3
20	2.8	2.4	1.9	1.0	.90	200	37	11	1.6	.02	.00	1.1
21	2.6	2.5	2.1	1.1	.95	146	34	11	2.0	.00	.00	.96
22	2.6	2.7	2.0	1.3	1.0	145	33	8.9	2.1	.00	.14	.96
23	2.1	2.9	1.9	1.3	1.0	152	31	7.7	1.9	.00	99	1.0
24	1.8	2.8	1.7	1.4	1.0	126	31	6.9	1.7	.00	56	.96
25	1.8	2.7	1.8	1.3	.95	126	32	5.9	2.2	.00	32	1.0
26	1.8	2.6	2.0	1.0	.95	125	27	5.6	2.0	.00	19	1.1
27	1.9	2.6	1.9	.50	1.0	121	26	5.1	2.3	.00	13	1.4
28	2.0	2.5	2.1	.20	1.1	93	25	7.1	2.6	.00	7.6	1.6
29	2.2	2.6	2.2	.05	---	82	25	11	3.1	.00	8.3	1.5
30	2.3	2.6	2.1	.00	---	70	25	9.6	3.9	.00	6.6	1.6
31	2.4	---	2.2	.00	---	65	---	9.7	---	.00	6.5	---
TOTAL	125.21	86.1	67.3	68.45	13.65	4975.65	1341	398.5	140.6	23.34	248.14	59.38
MEAN	4.04	2.87	2.17	2.21	.49	161	44.7	12.9	4.69	.75	8.00	1.98
MAX	20	4.4	2.7	3.7	1.1	1460	79	23	9.9	3.8	99	5.5
MIN	.31	2.2	1.5	.00	.00	.90	25	5.1	1.6	.00	.00	.96
AC-FT	24	171	133	136	27	9870	2660	790	279	46	492	118
CAL YR 1984	TOTAL	6395.97		MEAN	17.5	MAX	216	MIN	.00	AC-FT	12690	
WTR YR 1985	TOTAL	7547.32		MEAN	20.7	MAX	1460	MIN	.00	AC-FT	14970	

## 06356000 SOUTH FORK GRAND RIVER AT BUFFALO, SD

LOCATION.--Lat 45°34'34", long 103°32'38", in SW¼ sec.29, T.19 N., R.5 E., Harding County, Hydrologic Unit 10130302, on right bank at downstream side of bridge on U.S. Highway 85, 0.3 mi south of Buffalo.

DRAINAGE AREA.--148 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1955 to current year.

REVISED RECORDS.--WSP 1917: 1956-57. WDR SD-76-1: 1974(M), 1975.

GAGE.--Water-stage recorder. Datum of gage is 2,839.60 ft above National Geodetic Vertical Datum of 1929. Prior to May 5, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 9 to Mar. 20, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--30 years, 8.47 ft<sup>3</sup>/s (6,140 acre-ft/yr); median of yearly mean discharges, 7.0 ft<sup>3</sup>/s (5,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,780 ft<sup>3</sup>/s June 14, 1963 (gage height, 9.01 ft), from rating curve extended above 550 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in 1956-58, 1960, 1962, 1965, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1908 reached a stage of 15.4 ft, from information by South Dakota Department of Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 6	1345	369	6.22	Aug. 8	0715	*471	6.73
Mar. 16	unknown	a	*7.09				

a Backwater from ice.

Minimum daily discharge, 0.50 ft<sup>3</sup>/s Feb. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	2.4	2.7	1.6	.66	1.6	4.5	3.0	3.0	2.1	6.6	1.7
2	3.3	2.5	2.7	1.7	.54	1.6	4.8	2.9	9.6	2.0	4.1	2.0
3	3.2	2.6	2.7	1.8	.50	1.6	5.1	2.8	12	1.9	3.9	3.0
4	3.1	2.6	2.9	1.8	.54	1.5	4.9	3.3	7.0	1.8	3.1	2.5
5	4.5	3.0	3.0	2.0	.56	1.5	4.0	2.9	3.8	1.8	2.7	2.5
6	132	2.9	3.2	2.0	.60	1.6	4.1	2.6	2.9	1.7	2.3	2.5
7	23	2.5	3.2	1.9	.70	1.8	3.6	2.6	2.6	1.6	15	2.5
8	5.0	2.5	3.2	1.7	.80	2.1	3.5	2.6	2.5	1.6	170	2.6
9	3.7	2.5	3.2	1.5	.90	2.3	3.4	2.6	2.1	1.6	13	2.7
10	3.3	2.5	3.1	1.4	1.0	2.5	3.3	2.6	2.1	1.6	4.6	3.2
11	3.2	2.5	2.9	1.4	1.1	2.7	3.2	3.3	2.2	1.5	3.4	5.0
12	3.0	2.5	2.7	1.5	1.1	3.3	3.7	3.3	1.9	1.5	2.9	3.0
13	2.8	2.5	2.5	1.6	1.1	4.0	3.2	2.6	1.9	1.5	2.5	2.4
14	2.6	2.5	2.5	1.7	1.1	5.0	3.3	2.5	1.9	1.6	2.6	2.3
15	2.4	2.5	2.6	1.7	1.2	40	3.2	2.5	1.8	1.6	2.7	2.0
16	2.4	2.5	2.2	1.7	1.2	200	3.0	2.2	1.8	1.7	3.0	1.8
17	2.0	2.4	2.2	1.6	1.2	150	2.9	2.3	1.8	1.9	3.8	1.7
18	2.0	2.4	2.2	1.5	1.2	120	3.0	2.2	1.6	1.8	7.0	1.7
19	2.0	2.3	2.2	1.4	1.3	90	3.0	2.2	1.6	1.9	13	8.6
20	2.1	2.3	2.2	1.3	1.3	60	2.9	2.1	1.6	1.8	50	7.0
21	2.1	2.3	2.3	1.4	1.4	29	2.8	2.0	13	1.6	13	6.6
22	2.1	2.4	2.2	1.5	1.4	16	2.8	2.0	13	1.5	6.0	3.3
23	2.2	2.5	2.0	1.6	1.4	8.9	2.6	2.0	7.4	1.5	2.2	2.5
24	2.3	2.6	1.9	1.7	1.4	5.8	2.9	2.0	3.3	1.6	1.9	2.4
25	2.3	2.6	1.9	1.8	1.5	5.2	2.7	2.0	2.8	1.5	1.9	2.8
26	2.3	2.7	2.0	1.8	1.6	5.4	3.8	26	2.2	1.5	1.8	2.9
27	2.4	2.8	2.1	1.7	1.7	5.9	3.7	20	2.3	1.5	1.8	2.6
28	2.2	2.8	2.0	1.7	1.7	5.6	3.7	17	2.3	1.6	1.8	2.7
29	2.2	3.0	1.8	1.4	---	6.7	3.8	87	2.0	1.7	1.7	2.3
30	2.3	2.8	1.7	1.0	---	5.1	3.1	13	2.1	7.7	1.7	2.2
31	2.4	---	1.6	.80	---	4.4	---	4.7	---	4.6	1.7	---
TOTAL	233.9	76.9	75.6	49.20	30.70	791.1	104.5	230.8	116.1	60.8	351.7	91.0
MEAN	7.55	2.56	2.44	1.59	1.10	25.5	3.48	7.45	3.87	1.96	11.3	3.03
MAX	132	3.0	3.2	2.0	1.7	200	5.1	87	13	7.7	170	8.6
MIN	2.0	2.3	1.6	.80	.50	1.5	2.6	2.0	1.6	1.5	1.7	1.7
AC-FT	46	153	150	98	61	1570	207	458	230	121	698	180
CAL YR 1984	TOTAL	3643.76		MEAN	9.96	MAX	261	MIN	.57	AC-FT	7230	
WTR YR 1985	TOTAL	2212.30		MEAN	6.06	MAX	200	MIN	.50	AC-FT	4390	



## GRAND RIVER BASIN

06356500 SOUTH FORK GRAND RIVER NEAR CASH, SD

LOCATION.--Lat 45°38'56", long 102°38'27", in SW¼SW¼ sec.33, T.20 N., R.12 E., Perkins County, Hydrologic Unit 10130302, on left bank at downstream side of highway bridge, 1.0 mi upstream from Little Nasty Creek, 4.0 mi north of Cash, 10 mi south of Lodgepole, 12 mi northwest of Bison, and 16 mi downstream from Big Nasty Creek.

DRAINAGE AREA.--1,350 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,422.75 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 25, 1946, nonrecording gage, and Oct. 25, 1946, to May 16, 1966, water-stage recorder, at site 500 ft upstream. May 17, 1966, to May 2, 1968, nonrecording gage, at present site, all at same datum.

REMARKS.--Records good except those for winter period, Nov. 18 to Mar. 18, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--40 years, 53.5 ft<sup>3</sup>/s (38,760 acre-ft/yr); median of yearly mean discharges, 36 ft<sup>3</sup>/s (26,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft<sup>3</sup>/s Apr. 15, 1950 (gage height, 15.40 ft), from rating curve extended above 14,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 18	unknown	*2,500	a*6.93	No other peak greater than base discharge.			

a Backwater from ice.

Minimum daily discharge, 0.60 ft<sup>3</sup>/s Feb. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	14	8.5	2.3	.70	4.5	39	18	59	14	8.8	12
2	17	14	8.0	2.5	.60	4.5	35	17	42	14	12	11
3	15	15	7.5	2.7	.65	4.0	33	17	36	12	13	10
4	13	19	7.0	3.0	.65	4.0	34	17	39	11	11	11
5	12	19	6.3	3.0	.62	4.5	35	16	39	11	11	11
6	14	17	6.0	3.0	.61	4.5	34	17	37	9.7	11	11
7	34	19	6.5	2.8	.62	5.0	32	17	31	8.9	10	10
8	125	18	7.0	2.5	.70	5.0	30	16	24	8.5	9.1	9.8
9	56	15	7.0	2.5	.70	6.0	29	17	18	8.3	8.5	9.1
10	27	11	6.5	2.3	.80	7.0	28	16	18	7.4	7.4	9.8
11	19	14	6.0	2.3	.80	10	27	21	19	6.9	51	10
12	16	18	5.5	2.5	.90	15	27	24	17	6.7	25	12
13	15	15	5.0	2.7	1.1	30	27	22	16	6.6	17	14
14	14	18	5.0	2.7	1.5	150	26	25	15	7.7	12	15
15	14	11	5.0	2.7	2.0	600	25	23	14	8.0	11	14
16	12	13	4.5	2.8	2.5	1000	24	20	14	7.7	10	13
17	12	14	4.5	2.9	2.7	2100	23	19	13	7.4	11	11
18	12	13	4.0	2.7	2.9	2200	22	19	11	7.3	9.5	10
19	12	12	3.5	2.0	3.0	1520	22	19	10	7.1	9.5	10
20	11	11	3.5	1.9	3.0	950	21	18	11	6.8	10	10
21	11	11	3.0	2.0	3.0	600	21	17	12	6.0	13	11
22	11	10	3.0	2.0	3.2	416	21	17	14	5.4	84	15
23	11	10	3.0	2.2	3.5	283	20	17	14	5.5	55	14
24	12	10	2.8	2.5	3.5	166	20	17	23	5.2	22	15
25	12	10	2.8	2.5	3.5	109	20	17	21	5.5	15	14
26	12	9.5	3.0	2.5	4.0	77	20	20	43	5.5	13	12
27	13	9.5	3.0	2.4	4.5	61	23	24	34	5.7	11	12
28	9.9	9.0	2.8	2.2	5.0	55	22	93	27	5.8	11	11
29	11	9.0	2.5	2.0	---	45	23	76	19	5.7	11	11
30	13	8.5	2.5	1.5	---	46	20	107	16	6.7	11	11
31	13	---	2.3	1.2	---	40	---	105	---	7.7	11	---
TOTAL	601.9	396.5	147.5	74.8	57.25	10522.0	783	888	706	241.7	591.4	349.7
MEAN	19.4	13.2	4.76	2.41	2.04	339	26.1	28.6	23.5	7.80	19.1	11.7
MAX	125	19	8.5	3.0	5.0	2200	39	107	59	14	84	15
MIN	9.9	8.5	2.3	1.2	.60	4.0	20	16	10	5.2	8.5	9.1
AC-FT	119	786	293	148	114	20870	1550	1760	1400	479	1170	694
CAL YR 1984	TOTAL	15872.1		MEAN	43.4	MAX	906	MIN	1.4	AC-FT	31480	
WTR YR 1985	TOTAL	15359.75		MEAN	42.1	MAX	2200	MIN	.60	AC-FT	30470	

## GRAND RIVER BASIN

35

## 06357000 SHADEHILL RESERVOIR AT SHADEHILL, SD

LOCATION.--Lat 45°45'12", long 102°12'12", in E½ sec.25, T.21 N., R.15 E., Perkins County, Hydrologic Unit 10130302, at dam on Grand River, 1.3 mi southwest of Shadehill.

DRAINAGE AREA.--3,120 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--June 1950 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Apr. 3, 1952, occasional elevations obtained by level circuits and Apr. 3, 1952, to Apr. 28, 1970, nonrecording gage at same site and datum.

REMARKS.--Reservoir formed by earthfill dam. Storage began July 1, 1950; dam completed August 1951. Conservation storage, 81,443 acre-ft between elevations 2,250.8 ft (invert of canal and river outlet) and elevation 2,272.0 ft (crest of morning-glory spillway). Dead storage, 58,231 acre-ft below elevation 2,250.8 ft. Flood control, 217,708 acre-ft between elevations 2,272.0 ft and 2,302.0 ft (crest of emergency spillway). Surcharge, 111,203 acre-ft at elevation 2,312.0 ft (maximum pool elevation). Total reservoir capacity is 468,585 acre-ft at elevation 2,312.0 ft. The reservoir provides flood control and water for irrigation purposes. Figures given herein represent usable contents above elevation 2,250.8 ft. Prior to Oct. 1, 1968, reservoir contents published as total contents and included dead storage.

COOPERATION.--Records of elevation and contents provided by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum usable contents observed, 259,900 acre-ft Apr. 10, 1952 (elevation, 2,297.86 ft); minimum usable observed since first filling to spillway level, 24,941 acre-ft Nov. 17, 1981 (elevation, 2,258.62 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 79,645 acre-ft Apr. 2, 3 (elevation, 2,271.63 ft); minimum, 50,631 acre-ft Feb. 22 (elevation, 2,265.22 ft).

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	2,266.50	56,103	-
Oct. 31 . . . . .	2,265.87	53,302	-2,711
Nov. 30 . . . . .	2,265.81	53,136	-256
Dec. 31 . . . . .	2,265.58	52,156	-980
CAL YR 1984 . . . . .	-	-	-5,692
Jan. 31 . . . . .	2,265.34	51,138	-1,018
Feb. 28 . . . . .	2,265.90	53,520	+2,382
Mar. 31 . . . . .	2,271.61	79,548	+26,028
Apr. 30 . . . . .	2,271.36	78,343	-1,205
May 31 . . . . .	2,271.40	78,535	+192
June 30 . . . . .	2,271.00	76,617	-1,918
July 31 . . . . .	2,270.05	72,123	-4,494
Aug. 31 . . . . .	2,269.45	69,331	-2,792
Sept. 30 . . . . .	2,268.78	66,253	-3,078
WTR YR 1985 . . . . .	-	-	-10,150

## 06357500 GRAND RIVER AT SHADEHILL, SD

LOCATION (REVISED).--Lat 45°45'23", long 102°11'44", in NW¼NW¼ sec.30, T.21 N., R.16 E., Perkins County, Hydrologic Unit 10130303, on left bank 0.2 mi downstream from Shadehill Dam, 1.1 mi southwest of Shadehill, and 12.0 mi southwest of Lemmon.

DRAINAGE AREA.--3,120 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--February 1943 to current year. Records for July 1904 to October 1906 collected at site 4 mi upstream and published as "at Seim" in WSP 130, 172, and 208 have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 1279: 1943(M). See also Period of Record.

GAGE.--Water-stage recorder. Datum of gage is 2,192.48 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 31, 1947, nonrecording gage, and Aug. 31, 1947, to Oct. 24, 1958, water-stage recorder at site 0.8 mi downstream at datum 6.02 ft lower.

REMARKS.--Records good except those for winter periods, Dec. 1-8 and Dec. 12 to Feb. 23, which are poor. Several observations of water temperature and specific conductance were made during the year. Flow completely regulated by Shadehill Dam since July 1, 1950. (See station 06357000.)

AVERAGE DISCHARGE.--42 years, 112 ft<sup>3</sup>/s (81,140 acre-ft/yr); median of yearly mean discharges, 65 ft<sup>3</sup>/s (47,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,000 ft<sup>3</sup>/s Apr. 16, 1950 (gage height, 21.0 ft), from floodmarks upstream from bridge; 19.06 ft, from floodmark in gage well, unreliable, site and datum then in use; no flow for many days in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 135 ft<sup>3</sup>/s at 0100 hours, Oct. 1 (gage height, 3.50 ft); minimum daily discharge, 11 ft<sup>3</sup>/s Jan. 30.

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Shifting-control method used June 18 to July 8; stage-discharge relation affected by ice Nov. 27, Dec. 1 to Feb. 23)

2.5	9.9	3.2	78
2.6	15	3.5	131
2.8	30	4.0	262
3.0	51		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	13	14	14	12	13	109	46	29	52	44	39
2	135	13	14	15	12	14	116	46	30	53	44	39
3	133	13	13	16	12	15	121	46	29	54	44	39
4	133	13	14	17	13	13	121	48	29	54	43	38
5	133	13	16	17	13	13	121	48	29	52	43	38
6	133	13	16	17	13	13	121	47	29	52	43	38
7	133	13	17	16	13	13	121	47	29	53	44	37
8	132	13	17	16	14	13	120	39	32	54	45	37
9	131	13	17	16	14	13	119	32	29	52	45	37
10	131	13	16	15	14	13	119	32	30	52	44	36
11	71	13	15	14	14	13	109	33	28	52	44	36
12	18	13	15	15	14	13	93	32	28	52	44	36
13	17	13	15	16	14	13	92	33	28	51	44	35
14	17	13	15	16	14	13	92	30	28	49	44	35
15	17	13	15	16	15	13	93	30	28	48	44	35
16	17	13	14	17	15	13	94	30	28	48	44	34
17	17	13	14	17	15	13	84	29	44	48	43	34
18	17	13	13	16	15	14	49	29	59	46	43	34
19	17	13	14	14	15	27	47	29	51	46	43	33
20	18	13	15	13	14	77	47	29	40	46	44	33
21	18	13	15	14	14	83	45	29	40	46	44	33
22	17	13	14	15	14	105	45	29	39	45	45	32
23	14	13	14	16	14	105	45	30	39	44	43	32
24	13	13	13	16	14	106	47	31	38	43	43	32
25	13	13	14	15	13	107	45	30	39	44	43	32
26	13	13	14	16	13	107	45	31	39	44	42	32
27	13	14	14	16	13	108	44	31	48	45	42	33
28	13	15	14	15	13	108	44	32	53	45	42	33
29	13	15	13	13	---	109	45	31	53	45	40	33
30	13	14	13	11	---	109	47	32	52	45	40	33
31	13	---	13	12	---	109	---	31	---	44	40	---
TOTAL	1708	396	450	472	383	1498	2440	1072	1097	1504	1340	1048
MEAN	55.1	13.2	14.5	15.2	13.7	48.3	81.3	34.6	36.6	48.5	43.2	34.9
MAX	135	15	17	17	15	109	121	48	59	54	45	39
MIN	13	13	13	11	12	13	44	29	28	43	40	32
AC-FT	339	785	893	936	760	2970	4840	2130	2180	2980	2660	2080
CAL YR 1984	TOTAL	18052.4		MEAN	49.3	MAX	170	MIN	1.5	AC-FT	35810	
WTR YR 1985	TOTAL	13408		MEAN	36.7	MAX	135	MIN	11	AC-FT	26590	



## GRAND RIVER BASIN

37

06357800 GRAND RIVER AT LITTLE EAGLE, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 45°39'28", long 100°49'04", in NE¼NE¼ sec.32, T.20 N., R.27 E., Corson County, Hydrologic Unit 10130303, on left bank at downstream side of bridge on State Highway 63, 1.3 mi southwest of Little Eagle and 4.7 mi downstream from Little Oak Creek.

DRAINAGE AREA.--5,370 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,628.63 ft above National Geodetic Vertical Datum of 1929. Prior to May 12, 1959, nonrecording gage, and May 12, 1959, to Aug. 11, 1970, water-stage recorder at site 0.6 mi downstream at datum 2.00 ft lower. U.S. Army Corps of Engineers satellite data-collection platform at station.

REMARKS.--Records good except those for winter period, Nov. 17 to Mar. 16, which are poor. Flow regulated by Shadehill Dam 144 mi upstream. (See station 06357000.)

AVERAGE DISCHARGE.--27 years, 232 ft<sup>3</sup>/s (168,100 acre-ft/yr); median of yearly mean discharges, 180 ft<sup>3</sup>/s (130,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,000 ft<sup>3</sup>/s Mar. 23, 1978; maximum gage height, 21.76 ft Mar. 18, 1966, from floodmarks, ice jam, site and datum then in use; no flow at times in 1958-62, 1969, 1975, 1977-85.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,500 ft<sup>3</sup>/s at 0845 hours, Mar. 16 (gage height, 10.67 ft, backwater from ice); no flow Jan. 30 to Feb. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	140	14	14	3.5	.00	330	186	80	111	51	29	79
2	138	18	13	4.0	.00	250	178	74	93	49	60	87
3	137	20	13	4.5	.00	200	169	72	78	44	65	77
4	137	22	12	4.5	.00	160	167	68	77	38	47	67
5	137	20	12	4.5	.00	150	169	66	67	33	39	62
6	138	19	13	4.2	.00	160	171	64	69	29	36	56
7	140	29	14	4.0	.10	180	176	63	61	27	33	52
8	141	30	15	3.5	.50	200	178	62	50	26	30	47
9	140	25	15	3.5	.50	200	178	62	42	24	26	46
10	141	15	14	3.4	1.0	220	173	60	47	22	25	45
11	141	11	13	3.3	2.5	220	161	59	46	22	22	45
12	143	14	12	3.5	4.0	230	155	60	44	21	24	57
13	142	17	12	3.5	7.0	230	151	155	44	20	21	61
14	141	15	12	3.7	10	250	149	226	46	24	18	64
15	101	12	11	3.7	14	500	136	128	45	23	20	105
16	72	13	10	3.5	20	2500	127	92	39	23	25	94
17	58	13	9.0	3.0	30	3570	124	73	34	25	26	69
18	48	12	8.0	2.5	35	3030	122	63	35	41	26	57
19	43	12	8.5	2.2	40	2750	126	55	33	39	25	53
20	39	13	8.5	2.0	50	1860	176	49	33	36	23	53
21	37	15	8.0	2.2	70	1290	246	46	36	33	23	57
22	35	16	7.0	2.4	100	861	315	42	46	28	42	97
23	34	20	6.0	2.5	200	627	208	41	59	23	284	68
24	31	18	5.5	2.5	300	443	151	39	59	24	988	50
25	33	15	6.0	2.5	250	368	126	36	62	22	357	41
26	34	15	6.0	2.4	220	299	110	36	59	21	219	35
27	32	14	5.0	2.0	210	260	102	42	56	18	155	32
28	30	14	4.5	1.0	350	246	99	45	54	19	125	30
29	25	14	4.0	.50	---	215	94	54	61	16	102	29
30	23	14	3.5	.00	---	201	85	66	54	19	87	29
31	17	---	3.5	.00	---	186	---	82	---	25	81	---
TOTAL	2648	499	298.0	88.50	1914.60	22186	4708	2160	1640	865	3083	1744
MEAN	85.4	16.6	9.61	2.85	68.4	716	157	69.7	54.7	27.9	99.5	58.1
MAX	143	30	15	4.5	350	3570	315	226	111	51	988	105
MIN	17	11	3.5	.00	.00	150	85	36	33	16	18	29
AC-FT	525	990	591	176	3800	44010	9340	4280	3250	1720	6120	3460
CAL YR 1984	TOTAL	63816.60		MEAN	174	MAX	2010	MIN	.00	AC-FT	126600	
WTR YR 1985	TOTAL	41834.10		MEAN	115	MAX	3570	MIN	.00	AC-FT	82980	

## GRAND RIVER BASIN

06357800 GRAND RIVER AT LITTLE EAGLE, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1955 to September 1956, October 1968. to September 1969, October 1971 to current year.

## PERIOD OF DAILY RECORD.--

SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976.

SPECIFIC CONDUCTANCE: October 1975 to September 1976, October 1977 to September 1981.

WATER TEMPERATURE: October 1975 to September 1980.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily mean, 19,000 mg/L, May 2, 1972; minimum daily mean, 0 mg/L, Jan. 10, 11, Feb. 5-10, 1975.

SEDIMENT LOAD: Maximum daily, 259,000 tons, Mar. 12, 1972; minimum daily, 0 ton, Jan. 10, 11, Feb. 5-10, 1975.

SPECIFIC CONDUCTANCE: Maximum daily, 3,100 microsiemens, Dec. 4, 7-9, 1976; minimum daily, 290 microsiemens, Feb. 7, 1976.

WATER TEMPERATURE: Maximum daily, 33.0°C, Aug. 26, 1976; minimum daily, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	
DATE	TIME												
NOV 1984													
08...	1000	29	1850	8.7	14.0	2.5	6.0	724	12.5	97	K3	K8	
MAY 1985													
02...	1015	74	1000	8.7	18.0	16.0	60	742	9.1	95	340	K30	
AUG													
21...	0730	24	2100	8.7	18.0	18.5	220	723	7.7	88	1100	730	
		HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
DATE													
NOV 1984													
08...	280	0	50	38	360	73	10	8.3	380	690	13	.40	
MAY 1985													
02...	280	0	59	31	320	71	9	9.3	366	600	10	.40	
AUG													
21...	300	0	52	40	380	73	10	12	352	800	13	.50	
		SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
DATE													
NOV 1984													
08...	2.8	1380	1400	1.9	109	<.10	.020	.03	.70	.010	--	.020	
MAY 1985													
02...	5.5	1260	1300	1.7	252	<.10	.050	.06	1.2	.070	--	.080	
AUG													
21...	3.4	1510	1500	2.1	98	.41	.070	.09	1.4	.050	.15	.020	
		PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
DATE													
NOV 1984													
08...	.010	10	<1	44	1.0	1	<1	<3	17	8	<1	77	
MAY 1985													
02...	<.010	<10	1	65	<.5	<1	<1	<3	11	7	1	88	
AUG													
21...	<.010	<10	3	100	<10	1	<1	1	12	30	<1	60	

## GRAND RIVER BASIN

39

06357800 GRAND RIVER AT LITTLE EAGLE, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
NOV 1984 08...	28	<.1	<10	3	<1	<1	750	<6	15	44	3.5	94
MAY 1985 02...	7	.6	<10	7	<1	<1	770	<6	5	--	--	--
AUG 21...	20	.1	7	8	<1	<1	730	2	10	--	--	--



## MOREAU RIVER BASIN

06359500 MOREAU RIVER NEAR FAITH, SD

LOCATION.--Lat 45°11'52", long 102°09'22", in NW¼NW¼ sec.10, T.14 N., R.16 E., Perkins County, Hydrologic Unit 10130306, on left bank 10 ft downstream from bridge on State Highway 73, 3.1 mi downstream from Rabbit Creek, and 13.5 mi northwest of Faith.

DRAINAGE AREA.--2,660 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--March 1943 to current year.

REVISED RECORDS.--WSP 1176: 1944. WSP 1279: 1946(M).

GAGE.--Water-stage recorder. Datum of gage is 2,238.68 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 5, 1949, nonrecording gage 0.3 mi upstream and Oct. 5, 1949, to July 16, 1959, nonrecording gage and crest-stage gage at present site; both at datum 1.0 ft higher. July 17, 1959, to Sept. 1, 1971, recording gage at site 500 ft downstream at present datum.

REMARKS.--Records good except those for winter period, Nov. 15 to Mar. 20, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--42 years, 134 ft<sup>3</sup>/s (97,080 acre-ft/yr); median of yearly mean discharges, 92 ft<sup>3</sup>/s (66,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft<sup>3</sup>/s Apr. 9, 1944 (gage height, 20.9 ft), from flood-marks, site and datum then in use, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in 1944, 1946, 1948-51, 1955-66, 1968-71, 1974-75, 1978-81, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 18	0145	ice jam	*11.68	No other peak greater than base discharge.			
Mar. 21	0145	*5,130	10.71				

No flow Jan. 10 to Feb. 14, July 25-29, Sept. 9, 10.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	17	7.0	.10	.00	110	157	20	217	10	1.8	3.0
2	15	23	6.5	.12	.00	100	144	19	172	10	3.2	2.8
3	15	15	6.0	.14	.00	80	125	17	181	8.1	4.9	2.0
4	13	12	5.5	.14	.00	60	110	17	203	6.7	4.5	1.0
5	12	12	5.0	.12	.00	50	104	16	171	6.2	7.7	1.0
6	12	13	4.9	.10	.00	50	100	16	123	6.5	8.4	.85
7	12	11	5.5	.06	.00	55	98	14	97	5.4	5.9	.07
8	12	10	6.0	.03	.00	55	92	13	58	3.6	6.6	.25
9	11	11	6.0	.01	.00	60	87	12	36	1.8	8.0	.00
10	12	12	5.5	.00	.00	70	81	10	44	.50	8.0	.00
11	13	17	5.0	.00	.00	70	72	17	51	.35	8.0	.15
12	16	22	5.0	.00	.00	65	66	28	36	.25	7.3	3.8
13	19	15	5.0	.00	.00	65	62	174	37	.20	7.3	5.6
14	17	16	5.5	.00	.00	65	56	77	25	.15	7.0	4.7
15	17	16	5.0	.00	.10	60	52	51	20	.10	5.6	3.1
16	16	15	4.0	.00	.50	150	48	35	19	.08	5.6	3.6
17	16	14	3.0	.00	1.0	500	44	29	17	.06	5.6	3.2
18	14	13	2.5	.00	2.0	1000	42	26	15	.05	4.9	4.7
19	13	13	2.6	.00	5.0	3350	40	23	14	.04	5.2	14
20	12	14	2.8	.00	10	4500	55	22	13	.04	7.8	4.3
21	11	14	2.5	.00	20	4690	45	20	16	.03	21	3.0
22	12	15	2.0	.00	130	2660	39	19	17	.02	17	2.7
23	11	17	1.5	.00	150	1450	38	18	14	.02	16	2.5
24	11	14	1.0	.00	140	888	34	15	9.0	.02	6.9	2.0
25	11	13	1.0	.00	120	604	31	14	10	.00	4.5	2.6
26	11	11	1.1	.00	110	417	30	30	8.6	.00	.50	2.7
27	12	11	.80	.00	100	335	28	43	9.1	.00	1.0	3.1
28	13	10	.50	.00	100	299	22	48	8.3	.00	2.2	3.2
29	13	9.0	.30	.00	---	257	22	96	12	.00	3.2	3.4
30	21	8.0	.20	.00	---	230	21	108	10	.27	3.0	3.8
31	20	---	.10	.00	---	186	---	271	---	2.8	3.1	---
TOTAL	428	413.0	109.30	.82	888.60	22531	1945	1318	1663.0	63.28	201.70	87.12
MEAN	13.8	13.8	3.53	.03	31.7	727	64.8	42.5	55.4	2.04	6.51	2.90
MAX	21	23	7.0	.14	150	4690	157	271	217	10	21	14
MIN	11	8.0	.10	.00	.00	50	21	10	8.3	.00	.50	.00
AC-FT	84	819	217	1.6	1760	44690	3860	2610	3300	126	400	173
CAL YR 1984	TOTAL	53469.66		MEAN	146	MAX	2850	MIN	.10	AC-FT	106100	
WTR YR 1985	TOTAL	29648.82		MEAN	81.2	MAX	4690	MIN	.00	AC-FT	58810	

## 06360500 MOREAU RIVER NEAR WHITEHORSE, SD

LOCATION.--Lat 45°15'21", long 100°50'33", in SW¼SE¼ sec.17, T.15 N., R.27 E., Dewey County, Hydrologic Unit 10130306, on left bank 30 ft downstream from bridge, 2.4 mi southeast of Whitehorse, 8.8 mi downstream from Little Moreau River, and 16.3 mi southeast of town of Timber Lake.

DRAINAGE AREA.--4,880 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1954 to current year.

REVISED RECORDS.--WDR SD-78-1: 1977.

GAGE.--Water-stage recorder. Datum of gage is 1,661.48 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 24, 1954, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Nov. 24 to Mar. 20, which are poor. U.S. Weather Bureau gage-height telemeter at station. U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--31 years, 199 ft<sup>3</sup>/s (144,200 acre-ft/yr); median of yearly mean discharges, 120 ft<sup>3</sup>/s (86,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,700 ft<sup>3</sup>/s May 24, 1982 (gage height, 26.00 ft); maximum gage height, 26.20 ft Mar. 14, 1972 (backwater from ice); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1953 reached a stage of about 26.2 ft. Flood in March 1947 was probably higher.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 21	1530	*5,920	*13.35	No other peak greater than base discharge.			
No flow for many days.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	9.0	11	.25	.00	170	327	31	15	7.3	.00	7.2
2	.00	7.0	12	.14	.00	180	297	27	53	7.4	.00	5.6
3	.00	6.3	12	.16	.00	170	254	23	146	7.4	.00	4.0
4	.00	6.3	13	.18	.00	100	220	21	202	7.4	.00	2.8
5	.00	6.3	12	.18	.00	80	204	19	167	7.4	.00	1.8
6	.00	6.3	10	.14	.00	65	188	18	156	7.2	.00	1.2
7	.00	6.3	9.0	.07	.00	65	171	16	147	6.7	.00	1.6
8	.00	6.6	8.0	.04	.00	70	157	15	167	6.0	.00	2.2
9	.00	7.7	8.5	.03	.00	70	140	13	127	4.9	.00	1.5
10	.00	6.9	9.0	.01	.00	75	132	13	106	3.5	.00	.64
11	.00	6.6	8.5	.01	.00	70	121	14	113	2.4	.00	.44
12	.00	8.8	8.0	.00	.00	62	112	12	94	1.8	.00	.35
13	.00	7.4	7.5	.00	.00	60	106	12	71	.78	.00	3.6
14	.00	8.8	7.5	.00	.00	60	101	11	68	.32	.00	2.5
15	.00	11	8.0	.00	.00	55	90	12	63	.24	.00	.51
16	.00	8.6	7.0	.00	.00	100	80	12	52	.03	.00	.35
17	2.8	8.3	6.0	.00	.00	200	71	35	36	.00	.00	.35
18	7.2	9.3	5.0	.00	.00	500	66	82	28	.00	.00	.27
19	7.4	8.2	4.0	.00	.00	2000	60	62	27	.00	.00	.11
20	5.7	8.3	3.5	.00	.00	4700	92	45	20	.00	.00	.03
21	5.4	8.3	3.0	.00	.20	5750	90	35	16	.00	.00	.00
22	5.7	14	3.3	.00	10	5580	82	26	14	.00	.00	.00
23	7.4	16	3.0	.00	200	4540	210	21	12	.00	.00	.00
24	9.3	15	2.0	.00	230	2590	154	17	9.4	.00	.00	.00
25	9.3	13	1.2	.00	220	1630	110	14	9.3	.00	.00	.00
26	9.8	12	1.2	.00	190	1140	84	14	7.6	.00	.00	.00
27	9.8	12	1.3	.00	180	837	62	15	6.7	.00	.00	.00
28	9.8	11	.90	.00	170	646	51	15	5.4	.00	.00	.00
29	9.8	10	.70	.00	---	502	42	16	5.4	.00	7.9	.00
30	10	10	.50	.00	---	425	36	15	6.4	.00	30	.00
31	7.5	---	.35	.00	---	369	---	15	---	.00	12	---
TOTAL	116.90	275.3	186.95	1.21	1200.20	32861	3910	696	1950.2	70.77	49.90	37.05
MEAN	3.77	9.18	6.03	.04	42.9	1060	130	22.5	65.0	2.28	1.61	1.23
MAX	10	16	13	.25	230	5750	327	82	202	7.4	30	7.2
MIN	.00	6.3	.35	.00	.00	55	36	11	5.4	.00	.00	.00
AC-FT	23	546	371	2.4	2380	65180	7760	1380	3870	140	99	73
CAL YR 1984	TOTAL	71002.80		MEAN	194	MAX	3120	MIN	.00	AC-FT	140800	
WTR YR 1985	TOTAL	41355.48		MEAN	113	MAX	5750	MIN	.00	AC-FT	82030	

## MOREAU RIVER BASIN

06360500 MOREAU RIVER NEAR WHITEHORSE, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1968 to September 1969, October 1971 to September 1976, October 1977 to current year.

PERIOD OF DAILY RECORD.--

SUSPENDED-SEDIMENT DISCHARGE: October 1970 to September 1976.

REMARKS.--No flow Oct. 7 to Nov. 17, Jan. 6 to Mar. 9, May 27 to June 2, July 14 to Sept. 30. Sediment-discharge records prior to Oct. 1, 1971, on file in the District office, U.S. Army Corps of Engineers, Omaha, NE.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily mean, 20,300 mg/L, May 9, 1972; minimum daily mean, 0 mg/L on many days most years.

SEDIMENT LOAD: Maximum daily, 420,000 tons, May 10, 1975; minimum daily, 0 ton on many days each year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
DATE	TIME											
NOV 1984												
07...	1055	6.4	3140	8.3	12.0	3.0	7.0	724	11.8	93	120	K77
MAR 1985												
12...	1120	62	--	8.9	-2.5	.0	60	711	13.7	100	K11	K49
MAY												
01...	1030	32	880	8.5	22.5	18.0	32	744	10.2	111	K280	K42
DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 1984												
07...	560	297	120	62	660	71	13	15	260	1600	25	.40
MAR 1985												
12...	120	0	33	9.9	130	68	5	7.3	159	240	5.9	.20
MAY												
01...	210	31	54	19	210	67	6	7.9	183	470	9.9	.30
DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 1984												
07...	<1.0	2700	--	3.7	47	<.10	.030	.04	.90	.030	--	.020
MAR 1985												
12...	5.0	510	530	.69	85	.37	.150	.19	1.5	.210	--	.080
MAY												
01...	7.0	910	890	1.2	79	.28	.050	.06	1.0	.050	--	.080
DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INIUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 1984												
07...	<.010	20	<1	<100	<10	<1	<1	2	9	30	4	290
MAR 1985												
12...	.030	50	2	21	<.5	<1	<1	<3	30	93	1	44
MAY												
01...	<.010	<10	1	27	<.5	<1	<1	<3	12	7	3	110

MOREAU RIVER BASIN

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06360500 MOREAU RIVER NEAR WHITEHORSE, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN (T/DAY)
NOV 1984 07...	40	<.1	7	4	1	<1	1600	4	10	--	--
MAR 1985 12...	20	<.1	<10	7	3	<1	340	<6	25	--	--
MAY 01...	1	.2	<10	9	2	<1	630	<6	4	170	15



## CHEYENNE RIVER BASIN

06392900 BEAVER CREEK AT MALLO CAMP, NEAR FOUR CORNERS, WY

LOCATION.--Lat 44°05'04", long 104°03'41", in NE¼NE¼ sec.4, T.47 N., R.60 W., Weston County, Hydrologic Unit 10120107, between Forest Service Road 811 and right bank at Mallow Campgrounds, 300 ft upstream from mouth, 800 ft upstream from dam on Stockade Beaver Creek, and 3.8 mi east of Four Corners.

DRAINAGE AREA.--10.3 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1974 to current year.

REVISED RECORDS.--WDR SD-85-1: The daily discharge table for the 1981 water year was published in error. These tables supersede those published in the reports of 1981 and 1982.

CAL YR 1981 TOTAL 734.2 MEAN 2.01 MAX 2.5 MIN 1.2 AC-FT 1460

GAGE.--Water-stage recorder. Elevation of gage is 6,030 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair except those for winter periods, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--7 years, 1.92 ft<sup>3</sup>/s (1,390 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21 ft<sup>3</sup>/s Apr. 26, 1975 (gage height, 5.40 ft); minimum daily, 0.23 ft<sup>3</sup>/s Oct. 14, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3.3 ft<sup>3</sup>/s at 2230 hours, Sept. 5 (gage height, 4.46 ft), no peak above base of 10 ft<sup>3</sup>/s; maximum gage height, 5.67 ft Nov. 19 (backwater from ice); minimum discharge, 1.2 ft<sup>3</sup>/s Feb. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.3	2.0	1.6	1.7	2.0	2.2	1.9	1.7	1.9	2.2	2.3
2	2.3	2.3	2.0	1.6	1.8	2.0	2.2	1.9	1.7	1.9	2.2	2.3
3	2.3	2.3	2.0	1.6	1.7	2.0	2.3	1.9	1.7	1.9	2.2	2.3
4	2.2	2.3	1.9	1.6	1.7	2.0	2.4	2.0	1.7	1.9	2.2	2.3
5	2.2	2.3	1.9	1.6	1.6	2.1	2.4	2.0	1.7	1.9	2.2	2.5
6	2.2	2.2	1.9	1.6	1.6	2.1	2.3	2.0	1.7	1.9	2.2	2.5
7	2.2	2.3	1.9	1.5	1.5	2.1	2.1	2.0	1.7	1.9	2.2	2.4
8	2.2	2.3	1.9	1.5	1.5	2.0	2.0	2.0	1.8	1.9	2.2	2.3
9	2.3	2.2	2.0	1.5	1.4	2.0	2.0	1.9	1.9	1.9	2.2	2.3
10	2.3	2.3	2.0	1.5	1.2	2.0	2.0	1.9	1.9	1.9	2.2	2.3
11	2.3	2.3	2.0	1.5	1.3	2.0	2.0	1.9	1.9	1.9	2.3	2.4
12	2.3	2.4	2.1	1.5	1.4	2.0	1.9	2.0	1.9	1.9	2.3	2.4
13	2.3	2.5	2.1	1.5	1.5	2.0	1.9	2.0	1.9	2.2	2.3	2.4
14	2.3	2.5	2.1	1.5	1.7	1.9	1.9	1.9	1.9	2.1	2.3	2.3
15	2.6	2.5	2.1	1.4	1.9	1.9	1.9	1.9	2.0	2.0	2.3	2.3
16	2.5	2.4	2.1	1.4	2.2	1.8	1.9	1.9	2.0	2.0	2.3	2.3
17	2.4	2.2	2.0	1.5	2.2	1.8	1.9	1.9	2.0	2.1	2.4	2.3
18	2.3	2.2	1.9	1.6	2.0	1.8	1.9	1.9	2.0	2.1	2.3	2.3
19	2.3	2.4	1.9	1.7	1.9	1.8	1.9	1.9	2.0	2.0	2.3	2.3
20	2.3	2.5	1.9	1.8	2.0	1.8	2.0	1.9	2.0	2.0	2.3	2.3
21	2.3	2.6	1.8	1.9	2.0	1.9	2.0	1.9	2.0	2.0	2.3	2.3
22	2.4	2.5	1.8	2.1	2.0	1.9	2.0	1.9	2.0	2.3	2.3	2.3
23	2.3	2.4	1.8	2.0	2.0	1.9	2.0	1.9	2.0	2.2	2.3	2.3
24	2.2	2.4	1.8	2.0	2.0	1.9	2.0	1.9	2.0	2.2	2.3	2.3
25	2.3	2.3	1.8	1.9	2.0	1.9	1.9	1.9	1.9	2.4	2.3	2.3
26	2.3	2.4	1.8	1.8	2.0	1.9	1.9	1.9	1.9	2.3	2.4	2.3
27	2.3	2.4	1.8	1.8	1.9	2.1	1.9	1.8	1.9	2.3	2.4	2.3
28	2.3	2.3	1.7	1.8	2.0	2.2	1.9	1.9	1.9	2.2	2.4	2.3
29	2.3	2.3	1.6	1.8	---	2.3	1.9	1.9	1.9	2.2	2.3	2.3
30	2.4	2.3	1.6	1.7	---	2.2	1.9	1.8	1.9	2.2	2.3	2.3
31	2.3	---	1.6	1.7	---	2.2	---	1.7	---	2.2	2.3	---
TOTAL	71.5	70.6	58.8	51.5	49.7	61.5	60.5	59.2	56.5	63.8	70.7	69.8
MEAN	2.31	2.35	1.90	1.66	1.78	1.98	2.02	1.91	1.88	2.06	2.28	2.33
MAX	2.6	2.6	2.1	2.1	2.2	2.3	2.4	2.0	2.0	2.4	2.4	2.5
MIN	2.2	2.2	1.6	1.4	1.2	1.8	1.9	1.7	1.7	1.9	2.2	2.3
AC-FT	142	140	117	102	99	122	120	117	112	127	140	138

CAL YR 1980 TOTAL 915.3 MEAN 2.50 MAX 5.6 MIN 1.1 AC-FT 1820

WTR YR 1981 TOTAL 744.1 MEAN 2.04 MAX 2.6 MIN 1.2 AC-FT 1480

## 06395000 CHEYENNE RIVER AT EDMONT, SD

LOCATION.--Lat 43°18'20", long 102°49'14", in SW $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.36, T.8 S., R.2 E., Fall River County, Hydrologic Unit 10120106, on right bank at downstream side of bridge on U.S. Highway 18, at Edgemont, 300 ft downstream from Burlington Northern Railroad bridge, and 600 ft upstream from Cottonwood Creek.

DRAINAGE AREA.--7,143 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1903 to November 1906 (no winter records), April 1928 to February 1933, October 1946 to current year.

REVISED RECORDS.--WSP 1086: Drainage area. WSP 1116: 1947. WDR SD-78-1 1977.

GAGE.--Water-stage recorder. Datum of gage is 3,414.56 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 1, 1906, nonrecording gage 20 ft upstream at datum 0.7 ft lower. Apr. 11, 1928, to Feb. 28, 1933, Oct. 4, 1946, to Oct. 23, 1947, and Jan. 11, 1961, to Apr. 24, 1963, nonrecording gage, and Oct. 24, 1947, to Jan. 10, 1961, and Apr. 25, 1963, to Sept. 30, 1972, water-stage recorder all at present site at datum 2.00 ft higher.

REMARKS.--Records good except those for winter period, Nov. 27 to Mar. 18, which are poor. Many small reservoirs above station used for stock and irrigation water, total capacity, about 45,000 acre-ft. Several observations of water temperature and specific conductance were made during the year. U.S. Bureau of Reclamation satellite data-collection platform at station.

AVERAGE DISCHARGE.--43 years, 96.5 ft<sup>3</sup>/s (69,910 acre-ft/yr); median of yearly mean discharges, 72 ft<sup>3</sup>/s (52,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,000 ft<sup>3</sup>/s May 20, 1978 (gage height, 13.65 ft), present datum; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 12, 1920, reached a stage of 13.0 ft and May 1, 1922, 14.0 ft, present datum, from floodmarks at railroad bridge.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 19	0815	*496	3.01	unknown	--	ice jam	*4.87

No other peak greater than base discharge.  
No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	21	11	6.0	2.1	37	45	12	2.6	.71	.40	.02
2	5.7	21	10	7.0	2.1	35	42	12	2.8	.31	.37	.12
3	6.0	19	9.4	11	2.1	33	39	13	2.6	.00	.11	.20
4	7.1	17	9.4	12	2.1	32	41	12	2.8	.00	.11	.14
5	11	17	9.4	13	2.2	30	39	12	2.6	.00	.09	.05
6	13	19	9.4	13	2.3	35	36	9.1	2.6	.00	.12	.00
7	12	20	10	12	2.3	40	32	8.3	2.6	.00	.09	.09
8	11	21	12	10	2.4	44	30	7.9	2.2	.00	.12	2.1
9	11	25	13	9.4	2.4	47	31	8.2	1.6	.00	.29	.69
10	11	24	13	8.0	2.5	50	28	7.4	41	.00	.26	.52
11	11	24	11	6.0	2.6	51	26	7.5	22	.00	.37	.69
12	12	25	10	7.0	2.8	52	19	6.6	7.4	.00	.29	1.4
13	12	26	8.2	8.0	4.5	60	18	7.0	5.1	.00	.27	.60
14	12	27	10	9.0	7.0	70	19	5.6	4.3	.00	.49	.67
15	13	20	11	9.0	9.0	100	19	5.1	3.5	.11	.50	12
16	15	15	10	10	11	150	17	4.9	2.5	.11	.37	3.9
17	16	19	8.2	10	15	250	16	4.9	1.7	.00	.15	1.4
18	21	20	9.0	11	20	350	17	4.9	1.0	.00	.19	.70
19	20	18	10	10	25	438	28	5.3	.68	.00	.51	.28
20	19	12	11	9.2	37	314	16	4.8	.48	.00	.63	.00
21	19	13	11	8.0	35	222	15	4.1	.43	.00	.16	.00
22	21	21	11	9.0	33	186	14	4.1	.20	.00	.14	1.2
23	21	17	10	9.0	32	117	15	4.1	.11	.00	.13	1.3
24	21	23	8.0	10	31	110	16	3.9	.00	.54	.00	1.3
25	21	31	9.0	10	30	100	14	3.3	.00	.00	.00	1.3
26	22	11	10	10	30	84	17	3.3	2.3	.00	.00	1.2
27	23	11	11	9.2	32	76	16	2.6	2.8	.11	.06	1.4
28	21	12	10	8.0	38	66	13	2.9	1.1	.79	.18	2.9
29	21	12	9.0	5.0	---	60	14	2.6	.46	.08	.14	2.3
30	22	12	7.0	3.5	---	55	12	2.8	.57	.78	.13	2.7
31	22	---	6.6	2.2	---	50	---	3.0	---	.98	.00	---
TOTAL	479.0	573	307.6	274.5	417.4	3344	704	195.2	120.03	4.52	6.67	41.17
MEAN	15.5	19.1	9.92	8.85	14.9	108	23.5	6.30	4.00	.15	.22	1.37
MAX	23	31	13	13	38	438	45	13	41	.98	.63	12
MIN	5.7	11	6.6	2.2	2.1	30	12	2.6	.00	.00	.00	.00
AC-FT	95	1140	610	544	828	6630	1400	387	238	9.0	13	82
CAL YR 1984	TOTAL	37811.1		MEAN	103	MAX	1340	MIN	1.2	AC-FT	75000	
WTR YR 1985	TOTAL	6467.09		MEAN	17.7	MAX	438	MIN	.00	AC-FT	12830	

## CHEYENNE RIVER BASIN

06400000 HAT CREEK NEAR EDMONT, SD

LOCATION.--Lat 43°14'24", long 103°35'16", in SW¼SE¼NE¼ sec.25, T.9 S., R.4 E., Fall River County, Hydrologic Unit 10120108, on right bank at upstream side of bridge on State Highway 71, 2.0 mi upstream from mouth, 2.0 mi west of Heppner, and 12.5 mi southeast of Edgemont.

DRAINAGE AREA.--1,044 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1905 to September 1906, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,295.71 ft above National Geodetic Vertical Datum of 1929. Non-recording gage Apr. 8, 1905, to May 2, 1906, at site 0.6 mi downstream and May 3 to July 7, 1906, at site 0.4 mi upstream at different datum. Nov. 6, 1950, to May 1, 1951, and July 18 to Sept. 7, 1975, nonrecording gage and May 2, 1951, to July 17, 1975, recording gage, at site 0.4 mi downstream at present datum.

REMARKS.--Records good except those for winter period and/or no gage-height record, Jan. 21 to Mar. 16, which are poor. A few small diversions upstream from station for irrigation. Lander ditch diverts water from Hat Creek 0.4 mi upstream from gaging station for irrigating hay meadows downstream from station. Several observations of water temperature and specific conductance were made during the year. Results of discharge measurements, in cubic feet per second, of Lander ditch during water year 1985 are given herewith:

Oct. 4	0	Feb. 12	0	June 4	1.25
Nov. 8	2.33	Mar. 11	.80	July 1	0
Dec. 5	0	Apr. 3	1.72	Aug. 5	0
Jan. 8	0	May 6	1.60	Sept. 3	0

AVERAGE DISCHARGE.--36 years, 18.4 ft<sup>3</sup>/s (13,330 acre-ft/yr); median of yearly mean discharges, 12 ft<sup>3</sup>/s (8,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft<sup>3</sup>/s June 16, 1967 (gage height, 13.35 ft), from rating curve extended above 2,600 ft<sup>3</sup>/s on basis of slope-area measurement at 11.98 ft; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	0130	ice jam	*9.39	July 15	2345	*61	8.89

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	1.2	2.3	.78	.28	2.0	.32	.10	.32	.13	.00	.00
2	.00	1.4	2.1	.68	.28	1.8	.39	.28	.33	.00	.00	.00
3	.00	1.6	2.0	.81	.30	1.7	.45	.22	.16	.00	.00	.00
4	.00	.96	1.4	1.2	.34	1.5	.52	.14	.16	.00	.00	.00
5	.00	.96	1.2	1.6	.38	1.3	.43	.06	.36	.00	.00	.00
6	.00	.86	.92	1.7	.42	3.0	.43	.23	.66	.00	.00	.00
7	.00	1.3	.92	1.8	.46	5.0	.43	.34	1.1	.00	.00	.00
8	.00	1.0	1.0	1.7	.54	6.0	.44	.31	1.5	.00	.00	.00
9	.00	1.7	1.7	1.8	.64	8.0	.52	.27	2.2	.00	.00	.00
10	.00	2.8	1.8	1.8	.66	10	.55	.29	3.0	.00	.00	.00
11	.00	4.4	1.9	2.0	.62	13	.59	.40	3.9	.00	.00	.00
12	.00	3.9	2.0	2.0	.62	15	.62	.47	4.0	.00	.00	.00
13	.00	3.5	1.8	1.9	.82	17	.63	.78	4.1	.00	.00	.00
14	.00	3.3	1.9	1.8	1.1	18	.79	.83	4.1	.00	.00	.00
15	.00	3.1	1.9	1.7	1.5	18	1.2	.85	4.4	2.2	.00	.00
16	.00	5.0	1.8	1.6	1.7	17	1.3	.81	4.1	6.8	.00	.00
17	.00	4.4	1.8	1.8	1.8	16	1.5	.77	3.8	1.6	.00	.00
18	.00	3.1	1.7	1.8	1.9	13	1.5	.72	3.3	.94	.00	.00
19	.00	2.7	1.9	1.8	2.1	5.8	1.3	.78	3.0	.52	.00	.00
20	.00	2.7	1.2	1.8	2.4	2.5	1.3	.68	2.6	.45	.00	.00
21	.00	2.3	1.2	1.8	2.3	1.0	6.2	.87	2.0	.23	.00	.00
22	.00	2.2	1.2	1.7	2.2	.64	20	1.1	1.6	.06	.00	.00
23	.00	2.2	1.2	1.6	2.1	.18	8.6	1.7	1.2	.00	.00	.00
24	.00	2.1	1.2	1.6	2.1	.00	.49	1.1	.90	.00	.00	.00
25	.03	2.0	1.0	1.6	2.1	.04	.18	.90	.71	.00	.00	.00
26	.09	1.8	.88	1.6	2.0	.30	.18	.76	.73	.00	.00	.00
27	9.1	1.5	1.1	1.4	1.9	.16	.07	.64	.71	.00	.00	.00
28	5.3	2.2	1.4	1.3	2.2	.16	.10	.60	.51	.00	.00	.00
29	3.1	2.2	1.4	1.1	---	.17	.11	.52	.39	.00	.00	.00
30	2.8	2.2	.96	.50	---	.48	.09	.60	.30	.00	.00	.00
31	1.5	---	.70	.30	---	.33	---	.44	---	.00	.00	---
TOTAL	21.92	70.58	45.48	46.57	35.76	179.06	51.23	18.56	56.14	12.93	.00	.00
MEAN	.71	2.35	1.47	1.50	1.28	5.78	1.71	.60	1.87	.42	.00	.00
MAX	9.1	5.0	2.3	2.0	2.4	18	20	1.7	4.4	6.8	.00	.00
MIN	.00	.86	.70	.30	.28	.00	.07	.06	.16	.00	.00	.00
AC-FT	4	140	90	92	71	355	102	37	111	26	.00	.00
CAL YR 1984	TOTAL	8345.14		MEAN	22.8	MAX	625	MIN	.00	AC-FT	16550	
WTR YR 1985	TOTAL	538.23		MEAN	1.47	MAX	20	MIN	.00	AC-FT	1070	

## CHEYENNE RIVER BASIN

47

## 06400497 CASCADE SPRINGS NEAR HOT SPRINGS, SD

LOCATION.--Lat 43°20'10", long 103°33'07", in SE¼SW¼ sec.20, T.8 S., R.5 E., Fall River County, Hydrologic Unit 10120106, on right bank near upstream end of culvert on State Highway 71, 3.3 mi upstream from mouth, and 8.5 mi southwest of Hot Springs.

DRAINAGE AREA.--0.47 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1976 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,440 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--9 years, 20.2 ft<sup>3</sup>/s (14,630 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49 ft<sup>3</sup>/s July 4, 1977 (gage height, 6.25 ft); minimum daily, 16 ft<sup>3</sup>/s Mar. 16, 1981.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	19	20	21	21	19	19	20	22	22	21	22
2	20	19	20	21	21	19	19	21	22	22	21	22
3	20	20	20	21	21	19	19	21	22	22	21	22
4	20	20	20	21	21	19	19	21	22	22	21	21
5	20	20	20	21	20	19	19	21	22	22	21	22
6	20	20	20	21	20	19	19	21	22	22	20	22
7	19	20	20	21	20	19	19	21	22	22	20	22
8	19	20	20	20	20	19	19	21	22	22	20	21
9	19	20	20	21	19	20	20	21	22	22	20	21
10	19	20	20	21	19	20	20	21	22	22	21	21
11	19	19	20	21	19	20	20	21	22	22	21	22
12	19	19	20	21	20	20	20	21	22	22	21	22
13	19	19	20	21	20	20	20	21	23	22	21	22
14	19	19	20	21	19	20	20	21	23	22	21	22
15	19	19	21	21	19	20	20	21	22	22	21	22
16	19	19	22	22	19	20	20	21	22	22	21	22
17	19	19	22	22	19	20	20	21	22	22	21	22
18	19	20	22	22	19	19	20	21	23	22	21	22
19	19	19	22	22	20	20	20	21	23	21	21	21
20	19	19	22	22	19	19	20	21	23	21	21	21
21	19	20	22	22	20	19	20	21	22	21	21	21
22	19	19	22	22	20	20	20	21	22	21	21	21
23	19	19	22	22	19	19	20	22	22	21	21	21
24	19	19	21	22	19	20	20	22	22	21	21	21
25	19	19	21	22	19	20	20	22	22	21	21	21
26	19	22	21	22	19	19	20	22	22	21	21	21
27	19	21	21	22	19	19	20	22	21	21	21	21
28	19	19	21	22	19	19	20	22	21	21	21	21
29	19	19	21	22	---	19	20	22	21	21	22	21
30	19	20	21	22	---	19	20	22	21	21	22	21
31	19	---	21	22	---	19	---	22	---	21	22	---
TOTAL	595	586	645	666	549	602	592	659	661	669	650	644
MEAN	19.2	19.5	20.8	21.5	19.6	19.4	19.7	21.3	22.0	21.6	21.0	21.5
MAX	20	22	22	22	21	20	20	22	23	22	22	22
MIN	19	19	20	20	19	19	19	20	21	21	20	21
AC-FT	118	1160	1280	1320	1090	1190	1170	1310	1310	1330	1290	1280
CAL YR 1984	TOTAL	7820	MEAN	21.4	MAX	24	MIN	19	AC-FT	15510		
WTR YR 1985	TOTAL	7518	MEAN	20.6	MAX	23	MIN	19	AC-FT	14910		



## CHEYENNE RIVER BASIN

06400875 HORSEHEAD CREEK AT OELRICHS, SD

LOCATION.--Lat 43°11'17", long 103°13'34", in SW1SW1SW1SW1 sec.7, T.10 S., R.8 E., Fall River County, Hydrologic Unit 10120106, on left bank on downstream side of bridge on Highway 18, 1.5 mi downstream from Lone Well Creek, and 0.6 mi northeast of Oelrichs.

DRAINAGE AREA.--136 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,320 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Feb. 21 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 402 ft<sup>3</sup>/s Apr. 30, 1984 (gage height, 7.31 ft), no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 0.28 ft<sup>3</sup>/s at 0015 hours, Mar. 17 (gage height, 2.15 ft); maximum gage height, 2.25 ft Feb. 22 (backwater from ice); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.03	.11	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.02	.11	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.02	.11	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.02	.14	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.01	.14	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.01	.12	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.01	.10	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.01	.09	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.01	.09	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.02	.10	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.02	.10	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.05	.09	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.15	.08	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.20	.04	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.20	.03	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.25	.02	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.26	.02	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.26	.02	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.25	.02	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.24	.01	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.01	.20	.01	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.01	.20	.01	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.01	.20	.01	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.01	.20	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.02	.20	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.02	.17	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.02	.16	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.03	.15	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.11	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.12	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.11	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.13	3.86	1.57	.00	.00	.00	.00	.00
MEAN	.00	.00	.00	.00	.00	.12	.05	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.03	.26	.14	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	.3	7.7	3.1	.00	.00	.00	.00	.00
CAL YR 1984	TOTAL	2349.63		MEAN	6.42	MAX	358	MIN	.00	AC-FT	4660	
WTR YR 1985	TOTAL	5.56		MEAN	.01	MAX	.26	MIN	.00	AC-FT	11	

## CHEYENNE RIVER BASIN

49

## 06401000 ANGOSTURA RESERVOIR NEAR HOT SPRINGS, SD

LOCATION.--Lat 43°20'35", long 103°26'16", in SW¼NW¼ sec.20, T.8 S., R.6 E., Fall River County, Hydrologic Unit 10120106, at dam on Cheyenne River, 6.5 mi southeast of Hot Springs.

DRAINAGE AREA.--9,100 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1949 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Aug. 26, 1965, nonrecording gage at same site and datum.

REMARKS.--Reservoir formed by concrete gravity dam with earth embankment with gated concrete gravity spillway section. Storage began Oct. 3, 1949; dam completed December 1949. Conservation capacity, 82,443 acre-ft between elevations 3,139.75 ft (invert of lowest outlet) and 3,187.2 ft (top of spillway gates). Dead storage below elevation 3,139.75 ft, 8,598 acre-ft. Figures given herein represent contents above elevation 3,139.75 ft. Water stored for irrigation.

COOPERATION.--Records of elevation, contents, and diversions to Angostura project provided by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 145,200 acre-ft June 18, 1962 (elevation, 3,189.00 ft); minimum observed since normal operating level reached, 45,350 acre-ft Sept. 28, 1960 (elevation, 3,162.90 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 103,502 acre-ft Apr. 22 (elevation, 3,182.92 ft); minimum, 58,150 acre-ft Sept. 20 (elevation, 3,169.93 ft).

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)	†Diversions (acre-feet)
Sept. 30 . . . . .	3,178.28	85,340	-	-
Oct. 31 . . . . .	3,178.65	86,706	+1,366	-
Nov. 30 . . . . .	3,179.14	88,539	+1,833	-
Dec. 31 . . . . .	3,179.54	90,055	+1,516	-
CAL YR 1984 . . . . .	-	-	-6,030	-
Jan. 31 . . . . .	3,179.99	91,781	+1,726	-
Feb. 28 . . . . .	3,180.42	93,450	+1,669	-
Mar. 31 . . . . .	3,182.51	101,812	+8,362	-
Apr. 30 . . . . .	3,182.74	102,758	+946	925
May 31 . . . . .	3,180.81	94,978	-7,780	6,943
June 30 . . . . .	3,178.77	87,153	-7,825	7,059
July 31 . . . . .	3,174.84	73,345	-13,808	15,637
Aug. 31 . . . . .	3,171.37	62,394	-10,951	13,240
Sept. 30 . . . . .	3,170.05	58,497	-3,897	4,636
WTR YR 1985 . . . . .	-	-	-26,843	-

†Diversions from Angostura irrigation project.

## CHEYENNE RIVER BASIN

06401500 CHEYENNE RIVER BELOW ANGOSTURA DAM, SD

LOCATION.--Lat 43°20'42", long 103°26'12", in NE¼NW¼NW¼ sec.20, T.8 S., R.6 E., Fall River County, Hydrologic Unit 10120109, on right bank 800 ft downstream from Angostura Dam, 4.8 mi upstream from Fall River, and 6.5 mi southeast of Hot Springs.

DRAINAGE AREA.--9,100 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1945 to current year, seasonal records only beginning October 1978. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1946(M). WDR SD-78-1: 1962(M), 1967(M), 1971(M).

GAGE.--Water-stage recorder. Datum of gage is 3,058.02 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to Oct. 17, 1946, nonrecording gage and Oct. 17, 1946, to July 7, 1953, water-stage recorder at site 4.8 mi downstream at different datum.

REMARKS.--Records good. Flow regulated by Angostura Dam 800 ft upstream since October 1949. Several observations of water temperature and specific conductance were made during period. U.S. Bureau of Reclamation satellite data-collection platform at station.

AVERAGE DISCHARGE.--33 years (water years 1945-78), 78.5 ft<sup>3</sup>/s (56,870 acre-ft/yr); median of yearly mean discharges, 52 ft<sup>3</sup>/s (37,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,300 ft<sup>3</sup>/s May 20, 1978 (gage height, 15.97 ft), from rating curve extended above 12,000 ft<sup>3</sup>/s; no flow Oct. 9, 1949, to Feb. 5, 1950, Apr. 28, Aug. 26, 30, 1951.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 2.5 ft<sup>3</sup>/s, Apr. 3, July 28, 29 (gage height, 2.96 ft); minimum daily discharge, 1.2 ft<sup>3</sup>/s Mar. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1					1.4	1.4	1.4	1.5	1.8	1.7		
2					1.4	1.4	1.4	1.4	1.8	1.6		
3					1.4	1.4	1.5	1.4	1.9	1.6		
4					1.4	1.4	1.5	1.4	1.8	1.6		
5					1.4	1.4	1.4	1.5	1.7	1.7		
6					1.4	1.4	1.5	1.5	1.7	1.7		
7					1.4	1.3	1.4	1.7	1.7	1.8		
8					1.3	1.3	1.5	1.4	1.6	1.8		
9					1.3	1.4	1.4	1.3	1.7	1.9		
10					1.4	1.4	1.4	1.3	2.0	1.9		
11					1.4	1.4	1.4	1.3	1.9	1.7		
12					1.4	1.4	1.4	1.3	1.7	1.7		
13					1.4	1.4	1.4	1.5	1.6	1.7		
14					1.4	1.4	1.4	1.4	1.6	1.7		
15					1.4	1.4	1.4	1.4	1.6	1.7		
16					1.4	1.3	1.4	1.5	1.6	1.7		
17					1.4	1.3	1.3	1.5	1.6	1.6		
18					1.4	1.2	1.3	1.5	1.7	1.7		
19					1.4	1.3	1.4	1.4	1.8	1.8		
20					1.4	1.4	1.6	1.4	1.7	1.7		
21					1.4	1.3	1.5	1.4	1.9	1.7		
22					1.4	1.3	1.5	1.5	1.8	1.7		
23					1.4	1.4	1.5	1.6	1.8	1.9		
24					1.4	1.3	1.5	1.5	1.7	2.0		
25					1.4	1.3	1.6	1.4	1.8	1.9		
26					1.4	1.3	1.6	1.5	2.0	1.8		
27					1.4	1.4	1.5	1.6	1.8	1.8		
28					1.4	1.4	1.5	1.5	1.7	1.9		
29					---	1.5	1.4	1.5	1.7	1.9		
30					---	1.4	1.5	1.5	1.6	1.8		
31					---	1.5	---	1.6	---	1.7		
TOTAL					39.0	42.4	43.5	45.2	52.3	54.4		
MEAN					1.39	1.37	1.45	1.46	1.74	1.75		
MAX					1.4	1.5	1.6	1.7	2.0	2.0		
MIN					1.3	1.2	1.3	1.3	1.6	1.6		
AC-FT					77	84	86	90	104	108		

## CHEYENNE RIVER BASIN

51

## 06402000 FALL RIVER AT HOT SPRINGS, SD

LOCATION.--Lat 43°25'50", long 103°28'33", in NW¼NW¼ sec.24, T.7 S., R.5 E., Fall River County, Hydrologic Unit 10120109, on left bank at intersection of River Street and University Avenue in Hot Springs, and 6.0 mi upstream from mouth.

DRAINAGE AREA.--137 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for October 1937, published in WSP 1309.

REVISED RECORDS.--WSP 1279: 1938, 1941(M), 1947(M). WSP 1729: 1959(M).

GAGE.--Water-stage recorder. Datum of gage is 3,413.20 ft above National Geodetic Vertical Datum of 1929. Prior to June 2, 1939, nonrecording gage at site 300 ft upstream at datum 3.00 ft higher.

REMARKS.--Records fair. No gage-height record Oct. 1 to Nov. 6 and Jan. 9 to Feb. 11. Flow regulated by dam forming Coldbrook Reservoir, capacity, 7,200 acre-ft, since September 1952, and dam forming Cottonwood Springs Lake, capacity, 8,385 acre-ft since June 1969. Some diversion above station for municipal supply of Hot Springs. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--48 years, 24.8 ft<sup>3</sup>/s (17,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,100 ft<sup>3</sup>/s Sept. 4, 1938 (gage height, 18.4 ft), site and datum then in use, from rating curve extended above 51 ft<sup>3</sup>/s on basis of weir formula and slope-area measurement of peak flow; minimum, 4.0 ft<sup>3</sup>/s Sept. 23, 1940.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 449 ft<sup>3</sup>/s at 2000 hours, July 15 (gage height, 3.69 ft); minimum daily discharge, 14 ft<sup>3</sup>/s July 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	19	24	21	19	23	22	25	29	19	20	20
2	24	20	25	20	20	23	22	22	32	21	19	20
3	25	20	24	19	20	23	25	20	30	19	20	21
4	24	21	23	19	20	22	23	19	29	20	19	18
5	24	21	25	20	21	24	22	19	31	17	19	17
6	23	21	25	20	21	23	18	19	30	20	20	17
7	23	22	24	22	21	25	18	22	27	19	18	17
8	23	23	24	21	22	24	18	23	29	15	18	23
9	22	26	24	20	23	24	18	22	29	17	17	21
10	22	21	24	20	23	25	19	22	31	16	19	20
11	22	21	24	19	25	23	17	25	29	16	20	21
12	22	22	25	19	27	25	16	23	27	20	19	24
13	22	21	25	20	27	23	16	23	25	23	19	18
14	23	23	25	20	29	25	16	23	24	17	20	19
15	23	20	26	21	25	25	19	22	24	26	21	19
16	23	23	25	22	23	24	22	22	23	18	20	18
17	22	26	24	23	26	24	23	22	22	17	20	18
18	22	27	25	22	25	24	22	23	19	16	20	17
19	22	24	22	20	26	25	22	24	19	16	20	18
20	22	23	21	19	26	25	22	22	20	19	20	18
21	22	23	22	20	24	28	20	17	20	18	21	19
22	22	23	20	21	29	28	20	18	22	15	17	24
23	21	22	21	22	27	28	17	17	20	14	20	19
24	21	24	19	22	26	27	19	18	18	16	20	20
25	21	25	20	21	25	26	19	19	18	16	20	18
26	20	25	22	20	26	26	22	19	21	16	19	19
27	20	25	21	20	24	25	20	20	20	17	17	20
28	20	25	21	20	23	25	19	21	20	18	18	21
29	20	24	21	19	---	24	20	19	20	21	19	21
30	20	24	20	19	---	24	20	21	20	22	19	21
31	19	---	21	19	---	24	---	24	---	20	20	---
TOTAL	682	684	712	630	673	764	596	655	728	564	598	586
MEAN	22.0	22.8	23.0	20.3	24.0	24.6	19.9	21.1	24.3	18.2	19.3	19.5
MAX	25	27	26	23	29	28	25	25	32	26	21	24
MIN	19	19	19	19	19	22	16	17	18	14	17	17
AC-FT	135	1360	1410	1250	1330	1520	1180	1300	1440	1120	1190	1160
CAL YR 1984 TOTAL			8031	MEAN	21.9	MAX	27	MIN	19	AC-FT	15930	
WTR YR 1985 TOTAL			7872	MEAN	21.6	MAX	32	MIN	14	AC-FT	15610	



## CHEYENNE RIVER BASIN

06402500 BEAVER CREEK NEAR BUFFALO GAP, SD

LOCATION.--Lat 43°28'00", long 103°18'20", in NE¼SE¼ sec.5, T.7 S., R.7 E., Fall River County, Hydrologic Unit 10120109, on left bank 1.5 mi south of Buffalo Gap and 4.5 mi upstream from mouth.

DRAINAGE AREA.--130 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for October, November, 1957, published in WSP 1309.

REVISED RECORDS.--WSP 956: 1941. WSP 1309: 1939-40(M), 1947(M).

GAGE.--Water-stage recorder. Elevation of gage is 3,150 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to June 20, 1939, nonrecording gage at site 0.8 mi downstream at different datum.

REMARKS.--Records good. Nearly all flow is diverted above station during irrigation season. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--48 years, 7.06 ft<sup>3</sup>/s (5,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,700 ft<sup>3</sup>/s Sept. 4, 1938 (gage height, 16.46 ft), site and datum then in use, from rating curve extended above 11 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1927 reached a stage of 18.0 ft, former site and datum, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 24 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 4	1200	*13	4.20	Feb. 9	0600	a	*4.57

a Backwater from ice.  
No flow for part of July 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	11	10	9.0	6.6	7.9	5.4	4.7	.55	.37	9.9	8.4
2	9.9	11	10	8.4	6.0	8.0	6.1	1.4	.62	.35	9.0	9.0
3	10	11	11	8.0	6.0	8.2	5.8	1.2	.67	.28	8.3	9.3
4	10	10	11	7.4	6.0	8.0	5.7	1.0	.72	.22	8.4	9.3
5	11	10	11	7.2	6.0	8.0	5.0	.95	.65	.19	6.9	9.2
6	11	11	11	7.1	6.2	8.4	4.8	.90	.58	.17	5.5	8.9
7	10	10	11	6.9	6.2	8.5	4.7	.80	.51	.13	5.6	9.1
8	10	11	11	6.9	6.2	8.4	4.8	.73	.43	.11	4.9	10
9	10	12	11	7.0	6.2	8.3	5.2	.66	.44	.12	4.1	9.7
10	10	11	11	6.9	6.2	8.3	5.0	.70	.95	.12	4.1	9.7
11	10	11	11	6.6	6.4	8.3	4.8	.83	.75	.11	4.1	9.9
12	10	11	11	6.6	6.5	8.3	4.6	.71	.62	.07	4.7	11
13	10	11	11	6.6	6.8	8.3	4.6	.73	.53	.08	8.4	9.7
14	11	11	11	7.0	7.2	8.3	4.5	.64	.50	.09	8.9	9.7
15	11	11	11	7.0	8.2	8.4	4.5	.60	.47	.18	9.8	9.7
16	11	11	11	7.0	7.7	8.3	4.6	.60	.41	.31	9.9	9.5
17	11	11	11	7.0	7.7	8.2	4.9	.60	.39	.22	9.8	9.3
18	11	11	11	7.1	7.7	8.1	4.8	.57	.35	.19	8.3	9.3
19	11	11	11	6.7	7.7	8.2	4.9	.56	.34	.22	8.3	9.6
20	11	11	11	6.6	7.8	8.2	4.9	.57	.32	.28	5.0	9.6
21	11	11	12	6.6	8.1	8.2	4.9	.52	.30	.23	.82	9.7
22	11	11	12	6.6	8.0	8.2	4.9	.48	.28	.20	.56	10
23	11	11	12	6.8	8.1	8.1	5.2	.47	.25	.16	.45	10
24	11	11	11	7.0	8.0	8.0	4.2	.49	.28	.26	.50	10
25	11	11	10	7.3	8.0	8.1	3.5	.47	.30	.24	5.9	10
26	9.7	11	11	7.2	8.1	8.0	4.6	.52	.53	.18	5.7	10
27	10	11	11	7.2	7.9	8.2	4.7	.60	.56	.13	5.7	10
28	11	11	11	7.2	8.0	8.1	4.6	.57	.42	.22	3.7	10
29	11	11	11	7.2	---	8.0	6.5	.53	.39	.51	.61	11
30	11	11	11	7.0	---	7.6	6.6	.61	.38	4.9	.43	10
31	11	---	10	6.9	---	4.9	---	.55	---	9.8	1.6	---
TOTAL	326.4	328	340	220.0	199.5	250.0	149.3	25.26	14.49	20.64	169.87	290.6
MEAN	10.5	10.9	11.0	7.10	7.12	8.06	4.98	.81	.48	.67	5.48	9.69
MAX	11	12	12	9.0	8.2	8.5	6.6	4.7	.95	9.8	9.9	11
MIN	8.8	10	10	6.6	6.0	4.9	3.5	.47	.25	.07	.43	8.4
AC-FT	64	651	674	436	396	496	296	50	29	41	337	576
CAL YR 1984	TOTAL	3468.70	MEAN	9.48	MAX	17	MIN	.30	AC-FT	6880		
WTR YR 1985	TOTAL	2334.06	MEAN	6.39	MAX	12	MIN	.07	AC-FT	4630		

## CHEYENNE RIVER BASIN

53

06403300 FRENCH CREEK ABOVE FAIRBURN, SD

LOCATION.--Lat 43°43'02", long 103°22'03", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.11, T.4 S., R.6 E., Custer County, Hydrologic Unit 10120109, on right bank 500 ft upstream from concrete diversion dam, 1.0 mi southwest of landing strip in Custer State Park, 1.5 mi west of east boundary of Custer State Park, 2.6 mi southwest of abandoned Fairview School, and 3.5 mi southeast of Custer State Park Headquarters.

DRAINAGE AREA.--105 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--April 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,850 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Dec. 1 to Mar. 10, which are poor. Flow regulated by dam forming Stockade Reservoir, capacity, 1,820 acre-ft, 21 mi upstream. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 194 ft<sup>3</sup>/s June 24, 1982 (gage height, 2.21 ft); maximum gage height, 2.34 ft Feb. 21, 1985 (backwater from ice); minimum daily, 0.25 ft<sup>3</sup>/s July 13, 1985.

EXTREMES FOR CURRNET YEAR.--Maximum discharge, 23 ft<sup>3</sup>/s at 2130 hours, Sept. 12 (gage height, 1.18 ft); maximum gage height, 2.34 ft Feb. 21 (backwater from ice); minimum daily, 0.25 ft<sup>3</sup>/s July 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.0	8.5	4.2	1.1	.90	3.1	5.9	9.1	3.5	.62	.72	.34
2	5.0	8.3	3.2	1.3	.78	2.8	5.8	7.5	3.0	.68	.89	.35
3	4.8	8.4	2.6	2.0	.92	2.5	5.8	7.1	2.7	.60	.83	.40
4	5.6	9.2	2.3	3.5	1.0	2.4	5.8	7.1	2.6	.59	.81	.42
5	6.0	9.0	2.2	5.0	1.0	2.5	5.8	7.1	2.6	.58	.72	.38
6	6.0	8.6	2.3	5.8	1.1	2.7	6.0	6.3	2.5	.52	.75	.33
7	5.8	9.4	2.6	5.0	1.2	3.0	6.0	5.5	2.2	.44	.71	.31
8	5.8	9.2	2.8	4.3	1.2	3.1	6.2	5.0	2.0	.39	.63	.57
9	5.8	8.8	2.9	3.8	1.1	3.4	6.2	4.3	1.8	.33	.52	.81
10	5.8	9.0	2.8	3.6	1.0	4.8	6.2	4.1	1.7	.31	.58	1.7
11	5.8	8.6	2.7	3.2	1.2	5.7	7.2	3.8	1.6	.29	.53	1.8
12	6.1	7.0	2.6	3.7	1.4	4.9	9.2	3.5	1.6	.26	.54	15
13	6.1	6.6	2.4	4.1	1.5	4.7	10	3.7	1.6	.25	.46	15
14	5.9	6.6	2.3	4.4	1.7	4.7	9.8	3.3	1.5	.26	.42	5.1
15	5.7	5.8	2.3	4.7	2.0	5.1	8.6	3.1	1.5	.44	.44	2.8
16	5.5	6.4	1.9	4.9	1.7	5.7	7.7	3.0	1.3	.75	.43	2.0
17	5.3	6.3	1.7	5.2	1.6	5.9	7.4	3.0	1.1	.50	.46	1.5
18	5.0	6.6	1.5	4.2	1.7	6.4	6.9	2.6	.95	.41	.43	1.3
19	5.2	7.2	1.6	3.7	1.7	6.6	6.5	2.5	.88	.37	.45	1.1
20	5.9	6.4	2.0	3.1	2.0	7.0	7.0	2.4	.81	.37	.53	.97
21	5.7	5.3	2.4	2.8	2.3	6.8	7.6	2.5	.73	.34	.45	.92
22	5.5	4.4	2.3	3.2	2.1	6.2	7.1	2.4	.69	.34	.42	.89
23	5.6	4.4	1.8	4.1	2.1	5.6	6.6	2.2	.61	.32	.39	.91
24	6.2	5.0	1.6	4.6	2.4	7.8	6.2	2.0	.52	.42	.35	.96
25	6.4	4.8	1.4	5.0	2.7	9.0	5.9	1.9	.51	.41	.38	.99
26	7.4	4.6	1.7	5.2	2.9	8.6	6.3	2.3	.71	.34	.38	.97
27	7.5	4.3	2.4	5.4	3.2	8.0	9.3	4.1	.73	.28	.36	.95
28	7.2	4.1	2.2	5.0	3.6	7.8	9.5	6.7	.54	.26	.45	.93
29	7.2	4.3	1.7	4.5	---	9.0	13	6.8	.62	.48	.60	.92
30	7.1	4.4	1.3	3.8	---	9.0	11	5.4	.66	.89	.47	.92
31	7.3	---	1.1	.70	---	7.0	---	4.3	---	.67	.39	---
TOTAL	185.2	201.5	68.8	120.90	48.00	171.8	222.5	134.6	43.76	13.71	16.49	61.54
MEAN	5.97	6.72	2.22	3.90	1.71	5.54	7.42	4.34	1.46	.44	.53	2.05
MAX	7.5	9.4	4.2	5.8	3.6	9.0	13	9.1	3.5	.89	.89	15
MIN	4.8	4.1	1.1	.70	.78	2.4	5.8	1.9	.51	.25	.35	.31
AC-FT	36	400	136	240	95	341	441	267	87	27	33	122
CAL YR 1984	TOTAL	3908.9		MEAN	10.7	MAX	109	MIN	1.0	AC-FT	7750	
WTR YR 1985	TOTAL	1288.80		MEAN	3.53	MAX	15	MIN	.25	AC-FT	2560	

## CHEYENNE RIVER BASIN

06404000 BATTLE CREEK NEAR KEYSTONE, SD

LOCATION.--Lat 43°52'21", long 103°20'10", in SW1/4 sec.18, T.2 S., R.7 E., Pennington County, Hydrologic Unit 10120109, at right downstream end county highway bridge, 0.6 mi downstream from Iron Creek, and 4.5 mi south-east of Keystone.

DRAINAGE AREA.--66 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1945 to July 1947, October 1961 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,800 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Nov. 13, 1961, nonrecording gage at site 250 ft downstream at different datum and Nov. 13 to Dec. 5, 1961, at same site at present datum. Dec. 6, 1961, to June 9, 1972, water-stage recorder at site 210 ft downstream at present datum (destroyed by flood); June 10 to Nov. 20, 1972, nonrecording gage 180 ft downstream at present datum; Nov. 21, 1972, to Nov. 27, 1973, water-stage recorder at present site and datum; Nov. 28, 1973, to Nov. 7, 1974, nonrecording gage 180 ft downstream at present datum.

REMARKS.--Records good except those for winter period, Nov. 30 to Feb. 25, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--25 years (water years 1946, 1962-85), 8.85 ft<sup>3</sup>/s (6,410 acre-ft/yr); median of yearly mean discharges, 6.8 ft<sup>3</sup>/s (4,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,200 ft<sup>3</sup>/s June 9, 1972 (gage height, 14.5 ft), from flood-marks, site then in use, from rating curve extended above 550 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow for some days in 1961, 1962, 1970, 1974, 1976, 1980-85.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	1045	ice jam	*4.02	Mar. 18	0615	*34	3.63

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.87	1.4	1.0	.72	.00	.26	4.5	2.6	.49	.00	.05	.00
2	.90	1.6	.80	.84	.00	.35	3.6	2.3	.44	.00	.10	.00
3	1.0	1.6	.70	1.0	.00	.40	4.4	2.1	.58	.00	.06	.00
4	1.0	1.5	.62	1.1	.00	.50	6.6	1.9	.70	.00	.03	.00
5	1.7	1.5	.62	1.2	.00	.63	9.8	1.7	.59	.00	.00	.00
6	2.2	1.2	.62	1.1	.00	.58	4.4	1.6	.48	.00	.00	.00
7	1.9	1.2	.66	1.0	.00	.63	3.8	1.5	.42	.00	.00	.00
8	1.7	1.2	.80	.90	.00	.70	3.4	1.4	.33	.00	.00	.00
9	1.5	1.2	.90	.88	.00	.79	3.2	1.3	.25	.00	.00	.00
10	1.5	1.0	.90	.84	.00	1.0	3.4	1.2	.26	.00	.00	.00
11	1.6	1.0	.90	.84	.00	1.1	3.9	1.1	.47	.00	.00	.00
12	1.5	1.1	.88	.86	.00	1.3	4.1	1.2	.44	.00	.00	.31
13	1.5	1.1	.84	.90	.00	1.7	4.4	1.2	.28	.00	.00	.36
14	1.4	1.1	.80	.98	.00	1.8	3.8	1.1	.22	.00	.00	.17
15	1.2	1.1	.70	1.0	.00	2.2	3.6	1.0	.20	1.5	.00	.12
16	1.3	1.1	.60	1.0	.00	5.9	3.2	1.0	.16	.48	.00	.06
17	1.2	1.1	.45	1.1	.00	8.1	3.4	1.0	.12	.09	.00	.04
18	1.5	1.1	.51	.90	.01	11	3.4	1.0	.07	.05	.00	.01
19	1.6	1.2	.59	.70	.03	8.1	3.3	1.1	.04	.03	.00	.00
20	1.6	1.2	.62	.48	.03	5.5	3.6	1.0	.01	.00	.00	.00
21	1.6	1.2	.65	.48	.04	5.0	2.7	.97	.01	.00	.00	.00
22	1.6	1.2	.65	.51	.05	4.5	2.5	.83	.01	.00	.00	.00
23	1.6	1.2	.60	.53	.06	8.7	2.3	.78	.00	.00	.00	.00
24	1.7	1.3	.60	.56	.07	7.7	2.0	.77	.00	.00	.00	.00
25	1.6	1.4	.60	.60	.09	4.8	2.0	.70	.00	.00	.00	.00
26	1.6	1.2	.65	.60	.27	4.4	2.9	1.2	.00	.00	.00	.00
27	1.5	1.2	.75	.57	.27	8.6	3.4	1.4	.03	.00	.00	.00
28	1.4	1.2	.70	.50	.24	7.7	3.2	1.3	.04	.00	.00	.00
29	1.3	1.2	.62	.40	---	5.8	3.6	.99	.03	.00	.00	.00
30	1.4	1.1	.56	.25	---	4.9	2.9	.76	.00	.00	.00	.00
31	1.4	---	.62	.00	---	2.6	---	.59	---	.00	.00	---
TOTAL	45.37	36.7	21.51	23.34	1.16	117.24	111.3	38.59	6.67	2.15	.24	1.07
MEAN	1.46	1.22	.69	.75	.04	3.78	3.71	1.24	.22	.07	.01	.04
MAX	2.2	1.6	1.0	1.2	.27	11	9.8	2.6	.70	1.5	.10	.36
MIN	.87	1.0	.45	.00	.00	.26	2.0	.59	.00	.00	.00	.00
AC-FT	9	73	43	46	2.3	233	221	77	13	4.3	.5	2.1
CAL YR 1984	TOTAL	3169.29		MEAN	8.66	MAX	204	MIN	.22	AC-FT	6290	
WTR YR 1985	TOTAL	405.34		MEAN	1.11	MAX	11	MIN	.00	AC-FT	804	

## 06404998 GRACE COOLIDGE CREEK NEAR GAME LODGE, NEAR CUSTER, SD

LOCATION.--Lat 43°45'40" long 103°21'49", in SW¼NE¼ sec.26, T.3 S., R.6 E., Custer County, Hydrologic Unit 10120109, on right bank 0.3 mi downstream from bridge on U.S. Highway 16A, 0.9 mi east of Game Lodge, 1.5 mi southwest of junction of State Highway 36 and U.S. Highway 16A, and 11.5 mi east of Custer.

DRAINAGE AREA.--25.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,100 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 27 to Mar. 27 and Apr. 12 to May 13, which are poor. Considerable losses in sinkholes downstream from gage. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--9 years, 3.08 ft<sup>3</sup>/s (2,230 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 370 ft<sup>3</sup>/s May 18, 1981 (gage height, 9.49 ft); maximum gage height, 12.76 ft Feb. 9, 1979 (backwater from ice); no flow June 5-9, July 6, 8, 11, 19, 1977, for part of June 14, 1979, July 8, 28, 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1972, reached a stage of 10.35 ft, from floodmarks, discharge, 709 ft<sup>3</sup>/s from slope-area measurement of peak flow.

Flood of June 15, 1976, reached a stage of 10.90 ft, from floodmarks, discharge, 980 ft<sup>3</sup>/s on basis of slope-area measurement of 10.35 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 5	1945	*2.3	7.02	unknown	--	a	*9.81

a Backwater from ice.

No flow for part of July 8, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.3	1.3	.60	.40	.60	.73	1.3	.37	.24	.36	.15
2	1.5	1.3	1.2	.70	.45	.50	.88	1.3	.37	.24	.30	.14
3	1.4	1.4	1.1	.80	.50	.50	1.3	1.2	.36	.24	.25	.20
4	1.5	1.3	1.0	1.0	.50	.45	2.1	1.2	.49	.16	.21	.19
5	2.0	1.3	1.0	1.2	.60	.45	1.7	1.2	.41	.09	.20	.17
6	2.1	1.2	1.1	1.2	.60	.50	1.5	1.1	.40	.06	.24	.13
7	2.0	1.3	1.1	1.2	.70	.50	1.3	1.1	.35	.04	.22	.12
8	1.9	1.3	1.2	1.1	.70	.60	1.2	1.0	.27	.02	.20	.28
9	1.7	1.6	1.2	1.1	.60	.70	1.3	1.0	.25	.05	.20	.31
10	1.7	1.7	1.2	1.0	.60	.70	1.3	1.0	.27	.12	.30	.26
11	1.7	1.8	1.1	.90	.70	.70	1.4	.90	.36	.22	.27	.37
12	1.7	1.9	1.1	.90	.70	.70	1.4	.90	.36	.26	.32	.68
13	1.7	2.0	1.0	1.0	.70	.70	1.4	.80	.32	.72	.31	.45
14	1.5	1.9	1.1	1.2	.70	.70	1.4	.80	.29	.80	.27	.31
15	1.7	1.8	1.1	1.2	.80	.70	1.4	.74	.25	.50	.27	.35
16	1.7	1.7	1.0	1.2	.70	.70	1.4	.68	.23	.34	.28	.52
17	1.6	1.6	.90	1.2	.70	.80	1.3	.63	.22	.38	.28	.60
18	1.7	1.6	.90	1.2	.60	.80	1.3	.61	.19	.46	.25	.67
19	1.9	1.6	1.0	1.1	.70	.80	1.3	.60	.18	.35	.26	.70
20	1.6	1.7	1.0	.80	.70	.80	1.3	.49	.17	.24	.42	.74
21	1.5	1.6	1.0	.80	.70	.70	1.2	.48	.16	.17	.30	.79
22	1.5	1.6	1.0	.80	.60	.60	1.2	.44	.17	.14	.25	.87
23	1.5	1.6	.90	.90	.60	.60	1.2	.46	.16	.10	.21	1.0
24	1.5	1.5	.80	1.0	.60	.70	1.3	.44	.15	.17	.18	1.0
25	1.4	1.5	.70	1.0	.60	.80	1.4	.39	.16	.16	.17	1.0
26	1.5	1.6	.80	.90	.50	.80	1.4	.48	.27	.10	.15	.83
27	1.5	1.5	.90	.80	.50	.80	1.4	.56	.34	.06	.13	.60
28	1.4	1.5	.90	.70	.60	.72	1.3	.52	.28	.02	.18	.57
29	1.4	1.5	.70	.60	---	.67	1.3	.43	.24	.17	.45	.52
30	1.4	1.4	.60	.45	---	.65	1.2	.39	.23	.52	.29	.54
31	1.3	---	.60	.30	---	.68	---	.41	---	.42	.20	---
TOTAL	50.1	46.6	30.50	28.85	17.35	20.62	39.81	23.55	8.27	7.56	7.92	15.06
MEAN	1.62	1.55	.98	.93	.62	.67	1.33	.76	.28	.24	.26	.50
MAX	2.1	2.0	1.3	1.2	.80	.80	2.1	1.3	.49	.80	.45	1.0
MIN	1.3	1.2	.60	.30	.40	.45	.73	.39	.15	.02	.13	.12
AC-FT	9	92	60	57	34	41	79	47	16	15	16	30
CAL YR 1984	TOTAL	1552.18		MEAN	4.24	MAX	33	MIN	.25	AC-FT	3080	
WTR YR 1985	TOTAL	296.19		MEAN	.81	MAX	2.1	MIN	.02	AC-FT	587	



## CHEYENNE RIVER BASIN

## 06406000 BATTLE CREEK AT HERMOSA, SD

LOCATION.--Lat 43°49'41", long 103°11'44", in NE¼SW¼SW¼ sec.32, T.2 S., R.8 E., Custer County, Hydrologic Unit 10120109, on right bank 50 ft downstream from Chicago and North Western Transportation Company bridge, 0.8 mi south of Hermosa, and 2.9 mi downstream from Grace Coolidge Creek.

DRAINAGE AREA.--178 mi<sup>2</sup>.

PERIOD OF RECORD.--August to December 1903 (gage heights only), July 1949 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,290 ft above National Geodetic Vertical Datum of 1929, from topographic map. Nonrecording gage, August to December 1903, at site 50 ft upstream, July 7, 1949, to Nov. 2, 1950, at site 0.5 mi upstream, Nov. 3, 1950, to Dec. 6, 1961, at site 170 ft downstream, all at different datum. Dec. 7, 1961, to June 10, 1972, water-stage recorder (destroyed by flood), and June 11, 1972, to Aug. 28, 1972, nonrecording gage at site 80 ft downstream at present datum.

REMARKS.--Records good. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--36 years, 9.05 ft<sup>3</sup>/s (6,560 acre-ft/yr); median of yearly mean discharges, 6.2 ft<sup>3</sup>/s (4,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,400 ft<sup>3</sup>/s June 10, 1972 (gage height, 17 72 ft), from floodmarks, from rating curve extended above 2,800 ft<sup>3</sup>/s on basis of contracted-opening and flow-over-railroad embankment measurement of peak flow; no flow at times in 1954-57, 1959.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
July 15	2400	*593	*7.60	No other peak greater than base discharge.			

Minimum daily discharge, 0.94 ft<sup>3</sup>/s Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	9.5	8.4	6.4	4.3	5.3	5.4	4.1	4.2	2.3	2.5	1.4
2	9.3	9.5	7.5	6.4	4.3	5.1	5.4	4.1	4.2	1.6	2.4	2.1
3	9.3	9.3	6.8	6.7	4.0	4.6	5.3	4.1	4.4	1.6	2.5	1.2
4	9.3	9.1	6.8	7.1	4.0	4.5	6.1	4.1	4.6	1.6	2.7	.94
5	9.6	9.0	6.6	7.3	4.0	4.5	5.8	4.2	4.3	1.6	2.7	1.9
6	9.9	8.7	7.1	7.2	4.2	4.8	5.7	4.1	4.1	1.6	2.0	1.9
7	9.8	8.5	8.3	6.8	4.2	4.8	5.5	4.7	3.7	1.5	1.8	1.9
8	9.5	8.0	8.2	6.8	4.5	4.9	5.5	5.2	3.4	1.7	1.7	3.2
9	9.3	9.1	8.7	7.0	4.5	5.0	5.4	4.8	2.6	1.3	1.7	2.9
10	9.3	9.2	8.5	6.7	4.7	5.1	5.4	3.8	2.7	1.3	1.9	2.8
11	9.5	8.8	9.3	6.4	5.2	5.1	5.4	3.6	3.3	1.7	2.1	3.0
12	9.8	8.8	9.2	6.7	5.3	5.1	5.4	3.7	3.3	1.7	2.8	3.4
13	9.8	8.8	8.1	7.0	5.5	5.4	5.4	3.7	3.5	1.3	2.6	2.7
14	9.8	8.9	9.0	7.1	5.4	5.4	5.4	3.7	3.0	1.4	1.6	2.3
15	9.8	8.8	9.0	7.1	5.5	5.4	5.5	3.7	2.7	54	1.7	2.0
16	9.8	8.8	9.1	7.1	5.3	5.2	5.4	3.7	2.6	57	1.7	1.8
17	9.8	8.9	7.0	7.1	4.9	5.1	5.5	3.7	2.4	6.0	1.5	1.7
18	10	9.1	6.6	6.7	4.6	5.1	5.5	3.6	2.4	4.2	1.4	1.8
19	10	9.1	6.6	6.5	4.5	5.1	5.6	3.6	2.3	3.7	1.8	2.0
20	10	9.1	6.9	5.7	5.0	5.0	6.0	3.4	2.2	3.3	2.7	2.3
21	10	9.1	7.7	7.0	5.0	4.9	5.9	3.3	2.1	2.7	2.7	2.2
22	10	9.1	7.6	6.7	5.0	5.1	5.9	3.4	2.1	2.5	2.6	2.1
23	10	9.1	7.1	6.6	5.0	5.1	5.9	4.4	2.0	2.4	2.6	2.3
24	10	8.8	7.2	7.0	5.0	5.1	5.9	4.5	2.0	2.5	2.5	2.5
25	10	8.3	7.0	6.9	5.0	5.1	5.7	3.8	2.5	2.3	2.4	2.5
26	10	8.6	7.5	6.5	4.8	5.1	6.1	4.1	2.7	1.9	2.1	2.5
27	10	8.1	7.5	6.4	5.0	5.1	6.3	5.5	3.1	1.4	1.3	3.1
28	10	7.7	7.0	6.5	5.5	5.1	5.5	5.1	3.0	1.7	1.3	3.1
29	10	8.8	6.5	6.5	---	5.1	4.4	4.4	2.7	2.0	2.4	3.1
30	10	8.4	6.0	5.0	---	5.1	4.3	4.2	2.5	2.7	2.4	3.7
31	9.7	---	6.0	4.5	---	5.2	---	4.2	---	2.6	2.0	---
TOTAL	302.6	265.0	234.8	205.4	134.2	156.5	166.5	126.5	90.6	175.1	66.1	70.34
MEAN	9.76	8.83	7.57	6.63	4.79	5.05	5.55	4.08	3.02	5.65	2.13	2.34
MAX	10	9.5	9.3	7.3	5.5	5.4	6.3	5.5	4.6	57	2.8	3.7
MIN	9.3	7.7	6.0	4.5	4.0	4.5	4.3	3.3	2.0	1.3	1.3	.94
AC-FT	60	526	466	407	266	310	330	251	180	347	131	140
CAL YR 1984	TOTAL	4899.8		MEAN	13.4	MAX	143	MIN	2.6	AC-FT	9720	
WTR YR 1985	TOTAL	1993.64		MEAN	5.46	MAX	57	MIN	.94	AC-FT	3950	

## CHEYENNE RIVER BASIN

57

## 06408500 SPRING CREEK NEAR HERMOSA, SD

LOCATION.--Lat 43°56'31", long 103°09'32", in SE $\frac{1}{4}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$  sec.21, T.1 S., R.8 E., Pennington County, Hydrologic Unit 10120109, at left upstream end of county highway bridge, 0.3 mi upstream from Chicago and North Western Transportation Company bridge, and 7.5 mi north of Hermosa.

DRAINAGE AREA.--199 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1949 to current year.

REVISED RECORDS.--WSP 1729: 1950.

GAGE.--Water-stage recorder. Datum of gage is 3,265.30 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 30, 1973, nonrecording gage and crest-stage gage 210 ft upstream, and Mar. 30 to Sept. 30, 1973, water-stage recorder at present site, both at datum 2.00 ft higher.

REMARKS.--Records good except those for winter period and/or no gage-height record, Dec. 12 to Mar. 19, which are poor. Considerable loss in sinkholes in reach 10 to 15 mi above station. Flow slightly regulated by dam forming Lake Sheridan, capacity, 12,657 acre-ft, 24 mi above station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--36 years, 4.99 ft<sup>3</sup>/s (3,620 acre-ft/yr); median of yearly mean discharges, 1.6 ft<sup>3</sup>/s (1,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft<sup>3</sup>/s June 10, 1972 (gage height, 13.12 ft), site and datum then in use, from floodmarks, from rating curve extended above 350 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow; no flow for many days most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14 ft<sup>3</sup>/s at 1145 hours, Mar. 20 (gage height, 2.52 ft); maximum gage height, 3.37 ft, date unknown (backwater from ice); minimum daily discharge, 0.03 ft<sup>3</sup>/s July 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	3.9	3.1	1.0	1.2	2.8	1.5	1.2	.75	.40	.67	.12
2	3.2	3.9	3.1	1.1	1.2	2.6	1.3	1.3	.83	.39	.79	.15
3	2.9	3.9	3.0	1.3	1.3	2.3	1.3	1.4	1.0	.21	.55	.26
4	2.8	3.9	3.0	1.5	1.3	1.7	1.5	1.3	1.0	.13	.56	.29
5	2.6	3.9	2.9	1.6	1.4	1.6	1.3	1.2	.87	.21	.54	.22
6	2.4	2.6	2.6	1.6	1.5	1.6	1.2	1.2	.86	.23	.54	.12
7	2.3	2.7	2.5	1.6	1.5	1.7	1.1	1.1	.55	.13	.48	.11
8	2.3	2.6	2.8	1.5	1.7	1.8	1.1	1.2	.51	.08	.28	.43
9	2.4	3.3	2.2	1.5	1.5	1.9	1.2	1.2	.45	.12	.21	.57
10	2.4	3.3	2.0	1.5	1.6	2.0	1.2	1.2	.79	.06	.38	.64
11	2.6	3.3	1.6	1.6	1.6	2.0	1.3	1.1	.95	.06	.35	.61
12	3.1	3.6	1.6	2.1	1.7	2.1	1.3	.97	.64	.06	.45	.92
13	3.8	3.4	1.6	2.6	1.8	2.1	1.3	.87	.46	.03	.35	.62
14	3.6	2.7	1.5	2.6	2.0	2.1	1.2	.90	.36	.06	.30	.45
15	3.5	2.6	1.5	2.6	2.3	2.2	1.2	.94	.34	.22	.34	.45
16	3.8	2.6	1.5	2.6	2.2	2.4	1.0	.94	.38	.48	.42	.43
17	3.6	2.6	1.4	2.7	2.3	3.0	1.1	.87	.44	.20	.41	.37
18	3.7	2.8	1.3	2.7	2.4	7.0	1.1	.92	.65	.18	.30	.36
19	3.6	2.8	1.3	2.2	2.5	10	1.1	.97	.61	.11	.33	.32
20	3.3	2.8	1.4	1.8	2.6	13	1.1	.83	.69	.24	.49	.42
21	3.3	2.8	1.5	1.9	2.7	12	1.1	.71	.72	.17	.35	.49
22	2.8	2.6	1.4	2.1	2.7	10	1.1	.60	.71	.19	.29	.54
23	2.8	2.8	1.3	2.3	2.7	8.3	1.2	.68	.52	.21	.24	.54
24	3.1	2.7	1.2	2.5	2.7	7.4	1.1	.59	.47	.33	.24	.47
25	3.1	2.9	1.3	2.6	2.7	6.4	1.1	.56	.54	.29	.30	.45
26	3.5	3.0	1.4	2.5	2.8	5.3	1.2	.80	.73	.27	.29	.55
27	3.3	2.9	1.3	2.4	2.9	4.4	1.3	1.0	.84	.17	.31	.54
28	3.9	3.0	1.2	2.2	3.0	3.7	1.1	.98	.66	.11	.37	.54
29	3.9	3.0	1.1	1.8	---	2.8	1.3	.86	.56	.30	.42	.54
30	3.9	2.8	1.0	1.4	---	2.4	1.3	.94	.53	.96	.43	.59
31	4.2	---	1.0	1.3	---	2.1	---	1.0	---	.75	.24	---
TOTAL	99.0	91.7	55.6	60.7	57.8	130.7	36.2	30.33	19.41	7.35	12.22	13.11
MEAN	3.19	3.06	1.79	1.96	2.06	4.22	1.21	.98	.65	.24	.39	.44
MAX	4.2	3.9	3.1	2.7	3.0	13	1.5	1.4	1.0	.96	.79	.92
MIN	2.3	2.6	1.0	1.0	1.2	1.6	1.0	.56	.34	.03	.21	.11
AC-FT	19	182	110	120	115	259	72	60	38	15	24	26
CAL YR 1984	TOTAL	2273.53		MEAN	6.21	MAX	136	MIN	.01	AC-FT	4510	
WTR YR 1985	TOTAL	614.12		MEAN	1.68	MAX	13	MIN	.03	AC-FT	1220	

## CHEYENNE RIVER BASIN

06408700 RHOADS FORK NEAR ROCHESTER, SD

LOCATION.--Lat 44°08'12", long 103°51'29", in NW¼SE¼NE¼ sec.15, T.2 N., R.2 E., Pennington County, Hydrologic Unit 10120110, on left bank 1.1 mi upstream from South Fork Rapid Creek and 8.7 mi west of Rochester.

DRAINAGE AREA.--7.95 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--November 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 5,965 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9.7 ft<sup>3</sup>/s Mar. 16, 1985 (gage height, 2.00 ft); maximum gage height, 2.19 ft July 23, 1982 (backwater from vegetation); minimum daily discharge, 3.5 ft<sup>3</sup>/s Jan. 10, 1982.

CORRECTION.--Maximum discharge for 1984 water year is 9.2 ft<sup>3</sup>/s Aug. 8 (gage height, 1.97 ft); previously published figures were in error.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9.7 ft<sup>3</sup>/s at 0900 hours, Mar. 16 (gage height, 2.00 ft); minimum daily discharge, 5.4 ft<sup>3</sup>/s Aug. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	6.6	6.7	6.5	6.0	7.6	7.0	6.9	6.6	6.4	5.7	5.5
2	6.0	6.6	6.5	6.7	6.1	7.1	7.0	6.6	6.5	6.5	5.7	5.5
3	6.0	6.6	6.6	6.5	6.2	7.1	7.0	6.6	6.6	6.8	5.7	5.7
4	6.0	6.6	6.6	6.5	6.2	7.2	7.0	6.6	6.5	6.5	5.6	5.7
5	6.1	6.6	6.6	6.5	6.1	7.2	7.1	6.5	6.5	6.4	5.5	5.8
6	6.1	6.6	6.6	6.5	6.2	7.4	6.6	6.6	6.7	6.4	5.4	5.9
7	6.1	6.7	6.6	6.4	6.0	7.4	6.8	6.4	6.6	6.5	5.9	5.9
8	6.1	6.7	6.6	6.4	6.0	7.4	7.1	6.5	6.6	6.4	5.8	5.9
9	6.2	6.6	6.5	6.4	6.2	7.1	6.8	6.4	6.6	6.6	5.7	5.9
10	5.9	6.6	6.5	6.5	6.0	7.1	6.6	6.7	6.7	6.4	5.8	5.9
11	5.9	6.7	6.5	6.4	6.2	7.1	6.7	6.7	6.7	6.3	6.0	5.9
12	5.9	6.7	6.5	6.4	6.0	6.8	7.0	6.7	6.6	6.6	6.2	5.9
13	5.9	6.7	6.6	6.4	6.1	7.0	6.9	6.5	6.6	6.8	5.7	5.8
14	5.8	6.6	6.6	6.3	6.1	8.5	6.9	6.5	6.6	6.6	5.9	5.8
15	5.9	6.8	6.6	6.4	6.1	8.2	7.0	6.6	6.5	6.4	5.9	5.8
16	6.2	6.8	6.5	6.5	6.1	8.3	6.7	6.7	6.5	6.4	5.8	5.8
17	5.9	6.6	6.5	6.4	6.3	7.3	6.5	6.4	6.5	6.4	5.8	5.8
18	5.8	6.6	6.5	6.4	6.3	7.2	6.6	6.3	6.5	6.2	5.7	5.8
19	5.9	6.6	6.6	6.3	6.7	7.3	7.0	6.1	6.5	6.3	5.7	5.9
20	6.0	6.7	6.7	6.3	7.0	7.4	7.1	6.2	6.5	6.6	5.8	5.9
21	6.0	6.7	6.7	6.2	6.7	7.1	6.9	6.2	6.7	6.5	5.5	5.9
22	6.2	6.7	6.7	6.2	6.3	7.0	7.0	6.3	6.4	6.4	5.5	5.9
23	6.4	6.7	6.7	6.2	6.0	7.2	7.0	6.2	6.5	6.2	5.5	5.9
24	6.3	6.7	6.7	6.2	7.2	7.4	7.0	6.2	6.6	5.9	5.5	5.9
25	6.4	6.7	6.7	6.2	6.9	7.3	6.7	6.3	6.6	5.7	5.7	6.0
26	6.6	6.7	6.6	6.2	6.9	7.1	6.8	6.6	6.8	6.2	5.8	6.0
27	6.5	6.7	6.6	6.1	7.2	6.9	6.9	6.6	6.7	6.1	5.5	6.0
28	6.5	6.7	6.6	6.2	7.1	6.5	6.8	6.8	6.5	6.3	5.7	6.0
29	6.3	6.7	6.6	6.2	---	7.0	6.7	6.6	6.4	6.1	5.5	6.0
30	6.5	6.7	6.6	5.9	---	7.0	7.1	6.5	6.4	6.1	5.5	6.0
31	6.6	---	6.5	6.0	---	7.1	---	6.6	---	5.9	5.5	---
TOTAL	190.1	200.0	204.4	196.3	178.2	225.3	206.3	201.4	197.0	196.9	176.5	175.7
MEAN	6.13	6.67	6.59	6.33	6.36	7.27	6.88	6.50	6.57	6.35	5.69	5.86
MAX	6.6	6.8	6.7	6.7	7.2	8.5	7.1	6.9	6.8	6.8	6.2	6.0
MIN	5.8	6.6	6.5	5.9	6.0	6.5	6.5	6.1	6.4	5.7	5.4	5.5
AC-FT	37	397	405	389	353	447	409	399	391	391	350	349
CAL YR 1984	TOTAL	2474.4		MEAN	6.76	MAX	7.9	MIN	5.8	AC-FT	4910	
WTR YR 1985	TOTAL	2348.1		MEAN	6.43	MAX	8.5	MIN	5.4	AC-FT	4660	

## CHEYENNE RIVER BASIN

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06408700 RHOADS FORK NEAR ROCHFORD, SD--Continued

ACCUMULATED RAINFALL, IN INCHES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
SUMMATION VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.15	.00	.30	.08	.08	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00	.22
3	.00	.00	.00	.00	.00	.51	.00	.00	.25	.00	.00	.00
4	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.20
5	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.30	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.40	.00	.00	.00	.00	.00	.00	.00	.20	.00	.00
10	.00	.45	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00
11	.00	.00	.00	.00	.00	.20	.00	.00	.05	.68	.00	.00
12	.00	.00	.00	.00	.00	.00	.30	.00	.00	.30	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.08	.00	.10	.40	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00
18	.10	.00	.00	.30	.00	.00	.00	.00	.00	.00	.55	.00
19	.00	.00	.00	.00	.00	.00	.35	.00	.00	.00	.20	.00
20	.00	.00	.10	.00	.00	.00	.00	.00	.08	.00	.00	.00
21	.00	.00	.00	.00	.25	.00	.00	.00	.50	.00	.00	.00
22	.00	.00	.00	.00	.00	.13	.00	.00	.00	.10	.00	.05
23	.00	.00	.00	.00	.30	.00	.00	.00	.00	.05	.00	.05
24	.10	.00	.00	.00	.00	.00	.00	.00	.00	.20	.50	.30
25	.00	.10	.00	.00	.65	.00	.00	.20	.00	.00	.55	.63
26	.00	.30	.00	.00	.00	.00	.45	.60	.50	.00	.00	.03
27	.20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.20
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
29	.00	.00	.05	.00	---	.00	.00	.00	.02	.30	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.15	.00	.00	.00	.07
31	.00	---	.00	.00	---	.55	---	.00	---	.00	.00	---



## CHEYENNE RIVER BASIN

06409000 CASTLE CREEK ABOVE DEERFIELD RESERVOIR, NEAR HILL CITY, SD  
(Hydrologic bench-mark and radiochemical station)

LOCATION.--Lat 44°00'49", long 103°49'48", in SW¼ sec.25, T.1 N., R.2 E., Pennington County, Hydrologic Unit 10120110, on right bank 150 ft upstream from highway culvert, 20 ft downstream from South Fork Castle Creek, 800 ft upstream from high-water line of Deerfield Reservoir, 2.5 mi southwest of Deerfield Dam, and 14 mi northwest of Hill City.

DRAINAGE AREA.--79.2 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1948 to current year. Prior to October 1953, published as "above Deerfield Reservoir, near Deerfield".

REVISED RECORDS.--WSP 1917: 1952(M). WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 5,910 ft, from reservoir elevation. Prior to Aug. 31, 1948, nonrecording gage at site 150 ft downstream at datum 2.05 ft higher.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 10 to Feb. 25, which are poor.

AVERAGE DISCHARGE.--37 years, 10.6 ft<sup>3</sup>/s (7,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,120 ft<sup>3</sup>/s May 22, 1952 (gage height, 5.81 ft), from rating curve extended above slope-area measurement of gage height, 5.67 ft; minimum, 1.2 ft<sup>3</sup>/s Apr. 25, 1969; minimum gage height, 1.35 ft Nov. 12, 1949, Feb. 19, 1954, Mar. 7, 1957, Mar. 29, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 25	1730	*34	5.53	Nov. 23	1230	ice jam	*6.48

Minimum daily discharge, 6 ft<sup>3</sup>/s Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	11	10	7.5	6.5	11	14	13	12	9.9	8.7	10
2	13	12	10	8.0	6.5	10	16	13	12	9.7	8.9	10
3	14	13	9.0	9.0	7.0	10	15	13	10	9.1	8.7	10
4	13	12	8.5	12	7.5	9.0	13	13	10	8.8	7.9	9.9
5	15	13	9.0	15	8.0	8.0	12	13	10	8.5	7.7	9.7
6	14	14	11	12	8.0	10	11	13	10	8.2	8.1	9.5
7	13	12	13	11	8.5	10	10	13	10	8.3	7.7	9.3
8	13	12	16	10	8.5	10	10	13	10	8.4	7.5	9.3
9	13	12	17	9.0	8.5	11	10	13	10	8.6	7.9	9.3
10	13	11	16	8.0	9.0	11	11	11	11	8.4	7.7	9.6
11	12	10	12	6.5	9.0	12	14	12	11	8.4	8.1	9.9
12	12	11	11	7.0	9.5	13	18	12	11	8.9	8.3	12
13	12	12	10	8.0	10	12	17	12	11	8.5	8.3	10
14	12	12	10	9.0	11	13	16	12	10	8.3	8.5	10
15	12	12	11	9.0	13	13	16	12	11	7.9	8.7	10
16	12	12	10	9.0	12	13	16	12	10	7.9	8.9	10
17	12	11	8.0	8.5	10	14	16	12	10	8.7	8.9	10
18	12	11	8.5	7.5	10	14	16	12	10	8.5	8.9	11
19	12	10	9.5	6.5	11	15	16	14	10	8.1	10	11
20	13	13	10	6.5	12	16	16	13	10	7.9	11	11
21	12	11	9.5	8.0	11	16	15	13	11	7.9	11	11
22	12	12	9.0	9.5	10	15	15	12	11	7.9	11	11
23	13	12	8.0	10	10	14	15	13	11	12	11	10
24	12	15	7.5	11	10	16	15	12	11	10	11	11
25	11	12	9.0	12	10	20	13	13	12	9.0	10	11
26	11	12	12	12	10	17	14	14	15	9.0	9.8	11
27	11	12	13	11	9.5	15	14	13	13	9.3	10	12
28	11	11	14	10	10	12	14	13	14	10	11	11
29	12	11	12	10	---	11	13	12	13	9.5	11	11
30	11	11	10	8.0	---	13	13	13	11	10	10	12
31	12	---	7.5	6.0	---	13	---	13	---	9.1	10	---
TOTAL	384	355	331.0	286.5	266.0	397.0	424	392	331	274.7	286.2	312.5
MEAN	12.4	11.8	10.7	9.24	9.50	12.8	14.1	12.6	11.0	8.86	9.23	10.4
MAX	15	15	17	15	13	20	18	14	15	12	11	12
MIN	11	10	7.5	6.0	6.5	8.0	10	11	10	7.9	7.5	9.3
AC-FT	76	704	657	568	528	787	841	778	657	545	568	620
CAL YR 1984	TOTAL	6167.1	MEAN	16.8	MAX	95	MIN	7.5	AC-FT	12230		
WTR YR 1985	TOTAL	4039.9	MEAN	11.1	MAX	20	MIN	6.0	AC-FT	8010		

WATER-QUALITY RECORDS

WATER TEMPERATURE: May 1964 to September 1984.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum, 22.0°C, July 17, 1969; minimum, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

[illegible]

## CHEYENNE RIVER BASIN

06409000 CASTLE CREEK ABOVE DEERFIELD RESERVOIR, NEAR HILL CITY, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 1984 29...	2	8	10	<.1	<10	<1	<1	<1	71	<6	10
APR 1985 16...	<1	10	13	<.1	<10	3	<1	<1	68	<6	5
DATE	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. & FINER THAN .062 MM	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED (PCI/L AS YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS YT-90)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)
OCT 1984 29...	83	3.6	91	--	--	--	--	--	--	--	--
JAN 1985 23...	87	2.3	97	--	--	--	--	--	--	--	--
APR 16...	138	6.0	96	<6.5	7.6	<3.7	8.1	<3.2	6.9	.09	1.9
JUL 24...	35	1.0	98	--	--	--	--	--	--	--	--

## CHEYENNE RIVER BASIN

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## 06409500 DEERFIELD RESERVOIR NEAR HILL CITY, SD

LOCATION.--Lat 44°01'41", long 103°47'09", in NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.20, T.1 N., R.3 E., at dam on Castle Creek, Hydrologic Unit 10120110, 0.4 mi upstream from Dutchman Creek and 12.5 mi northwest of Hill City.

DRAINAGE AREA.--95 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--May 1947 to current year (monthend contents only). Some elevations obtained during period of initial filling, December 1945 to May 1947, are available in Bureau of Reclamation files. Prior to October 1953, published as "near Deerfield."

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to July 20, 1964, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earthfill dam. Storage began Dec. 3, 1945; dam completed in 1947. Usable capacity, 15,153 acre-ft between elevations 5,839 ft (lowest outlet) and 5,908 ft (crest of spillway). Dead storage below elevation 5,839 ft, 565 acre-ft. Figures given herein represent usable contents. Water is used to supplement Rapid City water supply and for irrigation in Rapid Creek basin downstream from Rapid City.

COOPERATION.--Records of elevation and contents provided by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 15,340 acre-ft May 22, 1952 (elevation, 5,908.50 ft), from capacity table extended above elevation 5,908.00 ft (crest of spillway); minimum observed, 5 acre-ft Oct. 2, 1959 (elevation, 5,839.10 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 15,036 acre-ft May 30 (elevation, 5,907.72 ft); minimum, 13,091 acre-ft Oct. 3 (elevation, 5,902.82 ft).

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	5,902.87	13,110	-
Oct. 31 . . . . .	5,903.50	13,352	+242
Nov. 30 . . . . .	5,904.94	13,914	+562
Dec. 31 . . . . .	5,906.46	14,522	+608
CAL YR 1984 . . . . .	-	-	+5,975
Jan. 31 . . . . .	5,908.03	15,165	+643
Feb. 28 . . . . .	5,909.03	15,584	+419
Mar. 31 . . . . .	5,907.48	14,938	-646
Apr. 30 . . . . .	5,907.60	14,987	+49
May 31 . . . . .	5,907.71	15,032	+45
June 30 . . . . .	5,907.37	14,828	-204
July 31 . . . . .	5,906.71	14,558	-270
Aug. 31 . . . . .	5,904.21	13,542	-1,016
Sept. 30 . . . . .	5,903.40	13,219	-323
WTR YR 1985 . . . . .	-	-	+109



## CHEYENNE RIVER BASIN

## 06410000 CASTLE CREEK BELOW DEERFIELD DAM, SD

LOCATION.--Lat 44°01'45", long 103°46'53", in NW¼SE¼ sec.20, T.1 N., R.3 E., Pennington County, Hydrologic Unit 10120110, on left bank 200 ft upstream from Dutchman Creek, 1,100 ft downstream from Deerfield Dam, and 12.5 mi northwest of Hill City.

DRAINAGE AREA.--96 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1946 to current year, seasonal records only beginning October 1983.

GAGE.--Water-stage recorder. Datum of gage is 5,784.52 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to Oct. 15, 1947, at site 400 ft downstream at datum 0.23 ft higher. Oct. 15, 1947, to Sept. 1, 1948, at site 550 ft downstream at datum 1.77 ft lower, and Sept. 2, 1948, to Nov. 2, 1971, at site 300 ft upstream at datum 4.0 ft higher.

REMARKS.--Records fair. Flow completely regulated by Deerfield Dam, 1,100 ft upstream. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--37 years (water years 1946 to 1983), 11.1 ft<sup>3</sup>/s (8,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 200 ft<sup>3</sup>/s May 22, 1952; maximum gage height, 4.99 ft Sept. 24, 1982 (backwater from culverts and heavy moss growth); no flow at times in 1948, 1950-60.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 35 ft<sup>3</sup>/s at 0915 hours, July 25 (gage height, 4.44 ft); minimum daily discharge, 11 ft<sup>3</sup>/s May 31, Sept. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1						17	22	12	12	12	17	25
2						18	20	12	12	12	16	25
3						18	20	12	12	12	15	25
4						18	19	12	12	12	15	24
5						18	19	12	12	12	15	24
6						18	19	12	12	12	16	19
7						19	19	12	12	12	20	16
8						19	19	12	12	12	22	16
9						19	19	12	12	12	25	16
10						19	19	12	12	12	27	16
11						19	19	12	12	13	28	13
12						19	17	12	12	12	28	11
13						19	16	12	12	13	29	11
14						20	16	12	12	13	28	12
15						24	15	12	12	13	29	12
16						26	15	12	12	14	29	13
17						27	15	12	12	13	29	14
18						27	15	12	12	14	29	15
19						27	13	12	12	14	30	15
20						27	12	12	12	14	30	16
21						27	12	12	13	14	29	16
22						27	12	12	13	14	29	17
23						27	12	12	12	14	29	17
24						27	12	12	12	14	28	17
25						27	12	12	12	15	28	17
26						27	12	12	12	16	27	17
27						26	12	12	12	16	27	16
28						26	12	12	12	16	27	16
29						26	12	12	12	16	26	15
30						26	12	12	12	17	26	14
31						26	---	11	---	17	26	---
TOTAL						710	468	371	362	422	779	500
MEAN						22.9	15.6	12.0	12.1	13.6	25.1	16.7
MAX						27	22	12	13	17	30	25
MIN						17	12	11	12	12	15	11
AC-FT						1410	928	736	718	837	1550	992

## CHEYENNE RIVER BASIN

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06410500 RAPID CREEK ABOVE PACTOLA RESERVOIR, AT SILVER CITY, SD

LOCATION.--Lat 44°05'05", long 103°34'48", in SW $\frac{1}{4}$ SE $\frac{1}{4}$  sec.36, T.2 N., R.4 E., Pennington County, Hydrologic Unit 10120110, on right bank 0.8 mi west of Silver City and 3.0 mi downstream from Slate Creek.

DRAINAGE AREA.--292 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,620.00 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark).

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 27 to Mar. 31, which are poor. Flow regulated by Deerfield Dam on Castle Creek since December 1945. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--32 years, 40.7 ft<sup>3</sup>/s (29,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,060 ft<sup>3</sup>/s May 15, 1965 (gage height, 10.44 ft), from rating curve extended above 1,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum daily, 4.0 ft<sup>3</sup>/s Jan. 20, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 75 ft<sup>3</sup>/s at 1300 hours, Apr. 1 (gage height, 4.96 ft); maximum gage height, 6.08 ft Mar. 2 (backwater from ice); minimum daily discharge, 12.0 ft<sup>3</sup>/s Jan. 31.

Rating table (gage height, in feet, and discharge, in cubic feet per second)  
(Stage-discharge relation affected by ice Nov. 16-20, Nov. 27 to Mar. 5, and Mar. 19-31)

4.3	8.9	4.8	51
4.5	22	5.0	76

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	23	21	16	13	23	61	39	31	26	25	39
2	37	27	17	17	13	21	61	39	31	26	25	39
3	37	29	17	19	14	20	66	38	31	23	25	41
4	38	27	18	22	14	18	65	37	31	24	25	40
5	40	22	19	23	15	17	54	36	31	23	24	39
6	47	21	20	22	16	19	53	36	31	22	24	38
7	44	27	22	20	16	21	49	35	30	22	24	32
8	40	25	22	19	17	22	51	35	27	22	25	31
9	40	23	22	18	18	24	55	34	27	22	27	31
10	38	21	21	16	18	25	56	34	27	22	33	30
11	38	23	20	15	19	26	60	34	26	21	35	30
12	38	24	19	17	20	28	65	34	26	21	35	30
13	37	26	18	21	21	30	63	33	26	22	35	26
14	37	28	19	22	23	31	58	32	26	22	35	23
15	37	20	21	23	25	32	56	31	26	22	36	22
16	37	20	19	24	24	34	55	31	25	22	36	22
17	36	20	18	24	24	34	53	31	25	22	36	21
18	37	20	17	22	24	35	51	31	25	22	36	21
19	36	20	19	18	26	37	51	31	24	22	36	21
20	31	21	20	16	24	39	51	31	21	22	37	21
21	30	21	20	18	24	41	47	31	21	22	38	21
22	25	26	19	19	24	42	44	31	21	22	38	21
23	25	25	18	20	24	46	43	31	21	22	38	22
24	27	26	14	20	24	53	41	31	22	24	37	22
25	28	25	16	20	24	57	39	30	22	25	38	22
26	27	25	18	19	24	55	39	33	22	24	38	23
27	26	25	22	17	25	52	39	34	22	24	37	23
28	24	23	20	15	26	52	39	33	22	24	40	23
29	28	24	18	14	---	54	39	32	22	24	47	23
30	32	23	14	13	---	56	39	31	23	25	41	24
31	27	---	15	12	---	58	---	31	---	25	38	---
TOTAL	1061	710	583	581	579	1102	1543	1030	765	711	1044	821
MEAN	34.2	23.7	18.8	18.7	20.7	35.5	51.4	33.2	25.5	22.9	33.7	27.4
MAX	47	29	22	24	26	58	66	39	31	26	47	41
MIN	24	20	14	12	13	17	39	30	21	21	24	21
AC-FT	210	1410	1160	1150	1150	2190	3060	2040	1520	1410	2070	1630
CAL YR 1984	TOTAL	18881		MEAN	51.6	MAX	194	MIN	11	AC-FT	37450	
WTR YR 1985	TOTAL	10530		MEAN	28.8	MAX	66	MIN	12	AC-FT	20890	

## CHEYENNE RIVER BASIN

## 06411000 PACTOLA RESERVOIR NEAR SILVER CITY, SD

LOCATION.--Lat 44°04'20", long 103°29'17", in NE¼SW¼ sec.2, T.1 N., R.5 E., Pennington County, Hydrologic Unit 10120110, in outlet works of dam on Rapid Creek, 3.8 mi east of Silver City.

DRAINAGE AREA.--319 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1956 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation datum). Prior to Feb. 18, 1970, nonrecording gage at same site and datum.

REMARKS.--Reservoir formed by an earthfill dam completed August 1956. Storage began Aug. 22, 1956. Conservation capacity, 54,960 acre-ft between elevations 4,456.1 ft and 4,580.2 ft. Combined dead and inactive storage below elevation 4,456.1 ft is 1,003 acre-ft. Flood storage capacity, 43,050 acre-ft between elevations 4,580.2 ft and 4,621.5 ft (crest of spillway). Surcharge capacity, 15,780 acre-ft between elevations 4,621.5 ft and 4,633.7 ft (maximum pool elevation). Figures given herein represent contents above elevation 4,456.1 ft. Reservoir provides flood control and water for municipal and irrigation uses.

COOPERATION.--Records of elevation and contents provided by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 60,970 acre-ft May 19, 1964 (elevation, 4,585.87 ft); minimum observed since initial filling, 40,566 acre-ft Oct. 2, 1981 (elevation, 4,561.50 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 54,806 acre-ft Apr. 30 to May 2 (elevation, 4,580.02 ft); minimum, 41,719 acre-ft Sept. 23, 24 (elevation, 4,563.15 ft).

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	4,578.71	53,690	-
Oct. 31 . . . . .	4,579.63	54,473	+783
Nov. 30 . . . . .	4,579.51	54,370	-103
Dec. 31 . . . . .	4,579.19	54,097	-273
CAL YR 1984 . . . . .	-	-	+846
Jan. 31 . . . . .	4,578.88	53,833	-264
Feb. 28 . . . . .	4,578.49	53,454	-379
Mar. 31 . . . . .	4,579.41	54,285	+831
Apr. 30 . . . . .	4,580.02	54,806	+521
May 31 . . . . .	4,575.08	50,688	-4,118
June 30 . . . . .	4,572.44	48,594	-2,094
July 31 . . . . .	4,565.19	43,173	-5,421
Aug. 31 . . . . .	4,563.57	42,016	-1,157
Sept. 30 . . . . .	4,563.26	41,797	-219
WTR YR 1985 . . . . .	-	-	-11,893

## CHEYENNE RIVER BASIN

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## 06411500 RAPID CREEK BELOW PACTOLA DAM, SD

LOCATION.--Lat 44°04'36", long 103°28'54", in SW¼NE¼ sec.2, T.1 N., R.5 E., Pennington County, Hydrologic Unit 10120110, on right bank 2,000 ft downstream from Pactola Dam, 3.9 mi upstream from Deer Creek, and 13 mi west of Rapid City.

DRAINAGE AREA.--320 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1928 to September 1932 (combined records of Creek and Dakota Power and Light Co. flume), July 1946 to current year. Prior to October 1953, published as "near Pactola." Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 1309: 1931(M).

GAGE.--Water-stage recorder; concrete control since Oct. 16, 1962. Datum of gage is 4,406.00 ft above National Geodetic Vertical Datum of 1929, Bureau of Reclamation bench mark. Apr. 19, 1929, to June 30, 1932, nonrecording gage at site 3,500 ft upstream at different datum. July 24, 1946, to Aug. 24, 1947, nonrecording gage and Aug. 25, 1947 to Nov. 18, 1953, water-stage recorder, at site 2 mi upstream at different datum.

REMARKS.--Records good. Flow regulated by dam on Castle Creek since Dec. 3, 1945 (see station 06409500), and completely regulated by Pactola Dam 2,000 ft upstream since Aug. 22, 1956 (see station 0641100). Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--43 years, 44.5 ft<sup>3</sup>/s (32,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,170 ft<sup>3</sup>/s May 22, 1952 (gage height, 6.74 ft), site and datum then in use; no flow Oct. 11-17, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 144 ft<sup>3</sup>/s 1000 hours, May 10 (gage height, 8.07 ft); maximum gage height, 8.09 ft July 12 (backwater from moss); minimum daily, 14 ft<sup>3</sup>/s Sept. 27-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	26	26	24	25	25	68	42	53	93	50	39
2	20	26	26	23	25	25	68	48	52	90	70	38
3	20	26	26	24	24	25	61	53	52	90	81	35
4	19	26	26	24	24	25	54	54	52	90	78	35
5	20	26	26	24	24	25	54	54	54	90	68	35
6	19	26	26	24	24	26	55	71	57	88	62	35
7	19	26	26	24	24	26	55	93	52	88	62	34
8	19	26	26	24	24	26	55	103	48	97	62	34
9	19	26	26	24	24	26	55	122	48	113	57	31
10	19	26	25	24	24	26	57	138	36	122	54	29
11	19	26	25	24	24	26	57	144	28	130	55	29
12	19	26	24	24	24	26	57	144	28	133	52	29
13	19	26	24	24	24	26	57	128	28	138	47	29
14	19	26	24	24	24	26	57	120	34	136	47	29
15	19	26	24	24	24	26	58	120	42	136	48	29
16	19	26	24	24	24	26	57	120	42	102	48	28
17	19	26	24	24	24	26	49	125	41	88	48	28
18	19	26	24	24	24	35	42	130	41	108	48	24
19	19	26	24	25	24	43	42	130	47	113	50	22
20	19	26	25	25	24	43	42	130	64	113	52	22
21	19	26	24	25	24	42	42	130	88	113	50	22
22	19	26	24	25	24	47	36	133	106	120	49	22
23	19	26	24	25	25	50	33	136	106	128	37	22
24	19	26	24	24	25	52	33	128	108	128	30	22
25	20	26	24	25	25	52	33	128	113	125	29	18
26	27	26	24	25	25	52	33	100	95	110	34	15
27	27	26	25	25	25	61	34	57	83	103	40	14
28	27	26	25	25	25	67	34	57	88	103	40	14
29	26	26	25	25	---	67	34	65	93	95	40	14
30	26	26	25	25	---	67	34	71	93	50	39	14
31	26	---	25	25	---	67	---	58	---	50	39	---
TOTAL	645	780	770	755	680	1182	1446	3132	1872	3283	1566	791
MEAN	20.8	26.0	24.8	24.4	24.3	38.1	48.2	101	62.4	106	50.5	26.4
MAX	27	26	26	25	25	67	68	144	113	138	81	39
MIN	19	26	24	23	24	25	33	42	28	50	29	14
AC-FT	128	1550	1530	1500	1350	2340	2870	6210	3710	6510	3110	1570
CAL YR 1984	TOTAL	19831		MEAN	54.2	MAX	222	MIN	14	AC-FT	39330	
WTR YR 1985	TOTAL	16902		MEAN	46.3	MAX	144	MIN	14	AC-FT	33530	



## CHEYENNE RIVER BASIN

06412500 RAPID CREEK ABOVE CANYON LAKE, NEAR RAPID CITY, SD

LOCATION.--Lat 44°03'04", long 103°18'47", in NE¼NE¼ sec.18, T.1 N., R.7 E., Pennington County, Hydrologic Unit 10120110, on right bank at bridge on State Highway 44, at city limits of Rapid City, and 2.8 mi downstream from Victoria Creek.

DRAINAGE AREA.--371 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1946 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,405.39 ft above National Geodetic Vertical Datum of 1929, levels by U.S. Army Corps of Engineers. Prior to Oct. 6, 1947, nonrecording gage, Oct. 6, 1947, to Nov. 2, 1967, and Oct. 1, 1968, to Sept. 30, 1976, water-stage recorder all at datum 2.0 ft higher. Nov. 3, 1967, to Sept. 30, 1968, nonrecording gage at site 0.2 mi downstream at datum 1.12 ft lower.

REMARKS.--Records good. Flow regulated by dam on Castle Creek since December 1945 (see station 06409500) and by Pactola Dam 21 mi upstream since August 1956 (see station 06411000). Several observations of water temperature and specific conductance were made during the year. National Weather Service telemeter at station.

AVERAGE DISCHARGE.--39 years, 39.7 ft<sup>3</sup>/s (28,760 acre-ft/yr); median of yearly mean discharges, 36 ft<sup>3</sup>/s (26,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,200 ft<sup>3</sup>/s June 9, 1972 (gage height, 17.77 ft), present datum, from floodmarks, from rating curve extended above 1,300 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in 1950-51, 1957-60, 1962-63, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 134 ft<sup>3</sup>/s at 1915 hours, July 15 (gage height, 3.94 ft); maximum gage height, 5.12 ft Jan. 1 (backwater from ice); minimum daily, 7.6 ft<sup>3</sup>/s Sept. 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	23	22	30	8.0	23	63	27	44	74	46	30
2	16	23	10	31	9.0	23	63	37	41	73	48	30
3	12	22	11	31	11	24	62	40	41	72	74	30
4	11	22	12	31	12	27	54	45	42	73	65	28
5	13	22	16	31	13	30	50	45	42	73	65	27
6	12	22	25	30	13	31	49	48	47	74	53	27
7	11	22	26	28	14	28	49	73	45	75	53	27
8	11	22	27	29	16	27	49	91	41	77	52	28
9	11	28	28	29	17	28	49	102	41	89	50	28
10	11	25	27	30	19	27	49	118	43	100	46	23
11	11	24	27	30	20	24	49	125	25	110	46	25
12	11	23	22	28	21	29	48	126	22	112	45	28
13	11	23	14	27	22	29	48	123	21	119	41	24
14	11	23	22	26	23	30	48	113	20	122	39	24
15	11	23	25	26	24	28	48	111	30	124	39	24
16	12	23	28	26	24	29	48	111	33	111	40	23
17	13	23	28	26	25	28	48	111	34	78	39	23
18	15	24	29	26	25	28	39	115	34	91	38	24
19	15	23	28	23	26	44	38	114	34	101	40	20
20	15	24	28	22	30	45	36	111	42	102	44	18
21	15	24	27	23	26	45	36	111	54	102	42	17
22	15	24	27	25	24	43	36	111	76	104	40	17
23	15	24	25	25	23	48	29	113	77	111	40	17
24	15	24	23	25	28	49	27	111	80	114	24	17
25	15	23	22	26	23	50	27	108	85	108	21	17
26	18	23	26	25	26	49	29	109	86	104	20	13
27	23	11	28	36	32	51	28	57	64	95	27	8.5
28	23	25	27	39	31	60	28	50	64	95	30	8.4
29	23	30	26	20	---	60	28	49	72	95	33	7.6
30	23	25	27	13	---	60	28	59	74	66	31	8.3
31	22	---	29	11	---	61	---	56	---	47	31	---
TOTAL	468	697	742	828	585.0	1158	1283	2720	1454	2891	1302	641.8
MEAN	15.1	23.2	23.9	26.7	20.9	37.4	42.8	87.7	48.5	93.3	42.0	21.4
MAX	28	30	29	39	32	61	63	126	86	124	74	30
MIN	11	11	10	11	8.0	23	27	27	20	47	20	7.6
AC-FT	92	1380	1470	1640	1160	2300	2540	5400	2880	5730	2580	1270
CAL YR 1984	TOTAL	19389.3		MEAN	53.0	MAX	240	MIN	7.6	AC-FT	38460	
WTR YR 1985	TOTAL	14769.8		MEAN	40.5	MAX	126	MIN	7.6	AC-FT	29300	

## CHEYENNE RIVER BASIN

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## 06414000 RAPID CREEK AT RAPID CITY, SD

LOCATION.--Lat 44°05'09", long 103°14'31", in NE¼SE¼SW¼ sec.35, T.2 N., R.7 E., Pennington County, Hydrologic Unit 10120110, on left bank 3,000 ft upstream from 12th Street in Rapid City and 3.6 mi downstream from Canyon Lake Dam.

DRAINAGE AREA.--410 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--June 1903 to November 1906, July 1942 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 3,230.00 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 30, 1906, nonrecording gage at site 1 mi downstream at different datum, and June 10, 1972, to Nov. 1, 1972, nonrecording gage at site 800 ft downstream at datum 0.80 ft higher. July 1942 to June 9, 1972, water-stage recorder at site 300 ft downstream at datum 0.80 ft higher (destroyed by flood).

REMARKS.--Records good. Several small diversions upstream from station to municipal park pools and for irrigation of about 320 acres. Flow regulated by Pactola Dam 25.4 mi upstream since Aug. 22, 1956. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--46 years, 61.3 ft<sup>3</sup>/s (44,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft<sup>3</sup>/s June 9, 1972 (gage height, 19.66 ft), from floodmarks, on basis of slope-area measurement of peak flow; minimum, 1.6 ft<sup>3</sup>/s Apr. 20, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 12, 13, 1920, reached a stage of 14.4 ft present datum, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 300 ft<sup>3</sup>/s at 1800 hours, Aug. 19 (gage height, 5.13 ft); minimum daily discharge, 27 ft<sup>3</sup>/s Nov. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	56	36	39	37	38	45	93	32	55	87	61	35
2	46	38	32	39	39	45	93	36	54	90	56	39
3	45	37	31	41	41	43	94	38	59	74	83	41
4	46	35	34	45	43	44	82	39	57	74	74	37
5	46	35	36	46	44	45	76	44	56	68	74	36
6	42	35	39	45	45	45	74	46	59	68	63	33
7	41	35	42	46	46	48	73	69	51	62	61	32
8	40	35	44	45	44	47	73	85	42	60	60	38
9	37	45	47	46	44	48	73	92	43	67	59	39
10	39	37	46	45	44	46	72	124	63	79	57	36
11	43	36	47	46	45	45	72	147	47	92	62	41
12	37	36	42	45	42	44	67	151	42	95	58	52
13	35	35	37	43	46	49	64	149	38	104	55	39
14	36	34	42	46	47	49	64	135	33	121	53	36
15	38	34	43	53	48	47	65	130	37	126	55	34
16	37	33	40	49	50	45	64	124	39	129	54	34
17	39	32	38	49	49	45	64	117	42	77	50	34
18	38	32	37	46	47	44	52	133	42	85	45	34
19	36	32	36	42	46	58	48	140	37	99	71	31
20	36	31	38	38	45	61	51	125	31	100	67	29
21	34	34	42	43	45	64	49	114	53	92	59	29
22	35	35	40	45	45	63	48	120	82	90	55	30
23	33	36	38	45	45	69	44	129	70	101	53	32
24	33	36	38	49	49	69	41	114	77	123	44	33
25	33	37	38	48	45	77	39	118	91	111	39	33
26	34	36	42	49	44	72	43	147	110	101	33	31
27	38	27	45	49	46	71	44	82	82	86	33	30
28	38	35	46	48	45	90	40	65	73	90	37	29
29	38	44	44	44	---	87	35	61	76	101	40	28
30	38	41	38	39	---	86	34	70	89	90	37	28
31	37	---	36	38	---	94	---	72	---	65	36	---
TOTAL	1204	1064	1237	1389	1257	1785	1831	3048	1730	2807	1684	1033
MEAN	38.8	35.5	39.9	44.8	44.9	57.6	61.0	98.3	57.7	90.5	54.3	34.4
MAX	56	45	47	53	50	94	94	151	110	129	83	52
MIN	33	27	31	37	38	43	34	32	31	60	33	28
AC-FT	239	2110	2450	2760	2490	3540	3630	6050	3430	5570	3340	2050
CAL YR 1984	TOTAL	26205	MEAN	71.6	MAX	273	MIN	25	AC-FT	51980		
WTR YR 1985	TOTAL	20069	MEAN	55.0	MAX	151	MIN	27	AC-FT	39810		

## CHEYENNE RIVER BASIN

06418900 RAPID CREEK BELOW SEWAGE PLANT, NEAR RAPID CITY, SD

LOCATION.--Lat 44°01'24", long 103°05'43", in NW¼NE¼NE¼ sec.25, T.1 N., R.8 E., Pennington County, Hydrologic Unit 10120110, on right bank 80 ft downstream from sewage treatment plant effluent and 6.7 mi southeast of Rapid City.

DRAINAGE AREA.--452 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,000 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Flow regulated by Pactola Dam 40.9 mi upstream since Aug. 22, 1956. Diversions for irrigation of about 7,000 acres upstream from station. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,680 ft<sup>3</sup>/s July 25, 1982 (gage height, 9.12 ft); minimum daily, 13 ft<sup>3</sup>/s Oct. 4, 7-9, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 631 ft<sup>3</sup>/s at 2330 hours, Aug. 19 (gage height, 5.82 ft); minimum daily, 16 ft<sup>3</sup>/s Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53	45	54	45	43	60	102	40	28	48	30	17
2	49	49	47	49	43	60	102	39	23	61	29	18
3	37	51	44	54	46	47	101	36	32	45	44	23
4	29	51	42	59	48	44	102	29	29	34	56	21
5	33	51	47	61	46	53	88	26	30	34	56	19
6	36	50	49	60	50	64	86	27	30	29	67	18
7	28	52	54	57	50	69	83	27	27	28	41	16
8	28	51	56	55	53	67	84	31	22	27	44	17
9	27	83	56	54	53	70	82	44	20	26	39	25
10	28	59	56	54	52	72	83	57	44	35	39	26
11	31	54	57	44	52	73	81	79	33	46	32	31
12	29	55	52	43	53	65	79	90	21	54	53	61
13	29	54	46	52	55	68	79	92	20	61	32	36
14	30	54	49	54	56	76	79	76	19	73	23	31
15	34	52	55	70	57	81	79	68	18	81	24	28
16	34	52	53	67	60	74	76	69	19	117	26	30
17	30	53	44	62	59	70	78	65	19	58	23	30
18	33	52	41	60	57	69	71	67	21	39	22	30
19	30	53	41	49	59	73	60	74	21	53	74	32
20	30	51	48	41	61	83	67	66	20	61	119	28
21	29	54	53	50	61	90	61	54	19	50	56	26
22	29	53	55	53	61	86	55	54	33	49	51	24
23	27	54	54	56	60	84	53	65	46	54	48	28
24	25	52	50	60	58	85	48	57	47	83	24	25
25	28	52	49	59	61	88	47	53	52	80	17	26
26	32	52	52	58	57	85	47	87	74	68	18	26
27	38	46	58	55	58	84	51	67	69	53	17	23
28	43	45	59	54	59	94	47	34	50	49	18	29
29	45	58	51	54	---	97	36	30	44	55	20	23
30	44	55	46	44	---	97	36	30	51	93	19	23
31	46	---	45	43	---	111	---	36	---	40	18	---
TOTAL	1044	1593	1563	1676	1528	2339	2143	1669	981	1684	1179	790
MEAN	33.7	53.1	50.4	54.1	54.6	75.5	71.4	53.8	32.7	54.3	38.0	26.3
MAX	53	83	59	70	61	111	102	92	74	117	119	61
MIN	25	45	41	41	43	44	36	26	18	26	17	16
AC-FT	207	3160	3100	3320	3030	4640	4250	3310	1950	3340	2340	1570
CAL YR 1984	TOTAL	28362	MEAN	77.5	MAX	462	MIN	20	AC-FT	56260		
WTR YR 1985	TOTAL	18189	MEAN	49.8	MAX	119	MIN	16	AC-FT	36080		

## CHEYENNE RIVER BASIN

71

06421500 RAPID CREEK NEAR FARMINGDALE, SD

LOCATION.--Lat 43°56'31", long 102°51'12", in SW¼SW¼SW¼ sec.19, T.1 S., R.11 E., Pennington County, Hydrologic Unit 10120110, on right bank at downstream side of bridge, 2 mi southeast of Farmingdale, and 4.8 mi downstream from Antelope Creek.

DRAINAGE AREA.--602 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1946 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,700 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Sept. 19, 1947, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Dec. 16 to Mar. 20, which are poor. Flow regulated by Pactola Dam 67 mi upstream since Aug. 22, 1956. Diversions for irrigation of about 10,000 acres upstream from station.

AVERAGE DISCHARGE.--39 years, 56.0 ft<sup>3</sup>/s (40,570 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,320 ft<sup>3</sup>/s June 10, 1972 (gage height, 11.85 ft), from floodmarks, from rating curve extended about 400 ft<sup>3</sup>/s on basis of contracted-opening and flow-over-road measurement of peak flow; no flow at times in 1949, 1952-56, 1958-63, 1969-71.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 340 ft<sup>3</sup>/s at 1545 hours, Aug. 20 (gage height, 6.93 ft); maximum gage height, 8.39 ft Mar. 7 (backwater from ice); minimum daily discharge, 2.3 ft<sup>3</sup>/s June 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	55	66	63	37	66	130	14	41	29	36	23
2	59	58	62	67	28	66	118	10	41	27	26	20
3	56	59	58	71	25	62	112	12	36	35	22	20
4	45	60	56	72	23	54	119	9.9	41	13	25	25
5	40	60	63	70	26	50	106	8.0	35	15	36	23
6	52	59	74	68	28	49	96	7.6	35	12	46	18
7	47	60	78	65	29	51	93	6.2	46	5.0	43	13
8	39	60	82	63	30	62	87	6.3	44	12	23	20
9	40	60	85	58	29	70	89	6.3	31	9.7	24	18
10	39	60	81	54	33	76	86	4.3	19	8.4	24	19
11	39	60	72	52	35	82	87	16	62	2.5	21	26
12	43	62	70	56	39	86	85	39	58	13	18	32
13	40	66	77	66	41	92	83	40	38	19	31	66
14	39	65	70	76	44	100	84	42	32	22	14	39
15	40	63	69	80	47	103	81	31	28	22	15	36
16	42	61	68	74	50	106	81	26	25	55	9.1	31
17	44	60	64	68	54	110	80	24	27	65	8.2	31
18	43	62	61	62	58	116	79	22	23	21	8.3	30
19	45	61	64	58	64	130	71	28	14	11	13	31
20	46	62	69	60	67	180	67	36	9.9	20	115	32
21	44	61	71	66	70	149	71	26	6.4	26	85	31
22	44	62	68	70	70	128	63	16	3.1	17	56	30
23	44	61	64	72	68	123	56	18	2.3	16	49	28
24	43	62	64	69	68	129	50	20	11	22	48	32
25	39	61	70	66	70	128	40	21	5.0	55	37	32
26	41	58	72	65	68	117	33	22	16	52	25	33
27	41	32	74	64	66	108	39	75	44	40	22	33
28	47	83	70	60	68	104	36	49	31	32	19	30
29	53	69	66	56	---	114	32	27	21	32	17	33
30	53	70	62	50	---	114	21	29	20	65	23	30
31	53	---	62	45	---	111	---	39	---	74	23	---
TOTAL	1398	1832	2132	1986	1335	3036	2275	730.6	845.7	847.6	961.6	865
MEAN	45.1	61.1	68.8	64.1	47.7	97.9	75.8	23.6	28.2	27.3	31.0	28.8
MAX	59	83	85	80	70	180	130	75	62	74	115	66
MIN	39	32	56	45	23	49	21	4.3	2.3	2.5	8.2	13
AC-FT	277	3630	4230	3940	2650	6020	4510	1450	1680	1680	1910	1720
CAL YR 1984	TOTAL	30481.1		MEAN	83.3	MAX	503	MIN	4.4	AC-FT	60460	
WTR YR 1985	TOTAL	18244.5		MEAN	50.0	MAX	180	MIN	2.3	AC-FT	36190	



## CHEYENNE RIVER BASIN

06422500 BOXELDER CREEK NEAR NEMO, SD

LOCATION.--Lat 44°08'38", long 103°27'16", in SE<sup>1</sup>SE<sup>1</sup> sec.12, T.2 N., R.5 E., Lawrence County, Hydrologic Unit 10120111, on right bank at ranch 0.2 mi upstream from county line, 0.9 mi downstream from Jim Creek, and 4.5 mi southeast of Nemo.

DRAINAGE AREA.--96 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1945 to July 1947, May 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 4,320.27 ft above National Geodetic Vertical Datum of 1929. July 1945 to July 1947 nonrecording gage at site 100 ft upstream at different datum. May 17, 1966, to June 9, 1972, water-stage recorder (destroyed by flood) and June 10, 1972, to Aug. 8, 1972, nonrecording gage, both at site 100 ft upstream at datum 2.00 ft higher.

REMARKS.--Records good except those for winter periods, Dec. 17 to Jan. 26 and Jan. 28 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--20 years (water years 1946, 1967-85), 18.4 ft<sup>3</sup>/s (13,330 acre-ft/yr); median of yearly mean discharges, 18 ft<sup>3</sup>/s (13,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,100 ft<sup>3</sup>/s June 9, 1972 (gage height, 20.4 ft, site and datum then in use, 22.0 ft, present site and datum), from floodmarks, from rating curve extended above 600 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; minimum daily, 0.70 ft<sup>3</sup>/s Dec. 30, 1968.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1911 reached a stage of about 16 ft, present datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	0015	ice jam	*3.29	Mar. 18	0045	*129	2.95

Minimum daily discharge, 1.4 ft<sup>3</sup>/s Aug. 13-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	5.8	8.2	5.0	3.0	4.6	11	8.6	8.0	3.9	3.6	1.9
2	9.8	7.7	8.2	5.5	3.0	4.6	14	8.2	7.9	4.3	3.2	1.9
3	9.5	8.7	8.2	5.5	2.5	4.6	14	8.2	8.3	4.2	2.9	2.1
4	9.5	7.7	8.2	6.0	2.4	4.0	14	8.0	9.1	3.7	2.5	2.0
5	11	6.8	7.5	6.5	2.2	3.5	11	7.3	8.4	3.4	2.4	1.9
6	13	6.0	7.5	6.5	2.5	4.6	11	6.5	7.8	3.0	2.1	1.7
7	12	8.4	7.0	6.0	2.5	5.0	9.0	6.2	5.5	2.9	2.1	1.6
8	10	7.7	7.5	6.0	2.9	5.0	8.8	6.3	5.0	2.8	1.9	1.6
9	9.5	9.1	7.5	5.5	3.1	5.0	12	6.0	4.7	2.6	1.6	1.6
10	9.2	7.4	8.0	4.7	3.0	5.2	13	6.1	5.0	2.1	1.6	1.6
11	9.0	8.1	8.5	4.7	3.2	5.4	13	6.0	6.3	2.1	1.6	1.9
12	8.5	8.1	9.1	5.0	3.4	5.6	14	6.0	6.1	2.3	1.5	2.7
13	8.5	8.6	9.2	5.5	3.6	6.2	14	6.0	5.8	2.2	1.4	2.8
14	8.0	9.9	9.4	6.0	3.8	10	12	6.0	5.8	1.9	1.4	2.4
15	7.5	5.8	9.2	6.0	4.0	16	12	5.7	5.5	1.9	1.4	2.3
16	7.5	8.1	8.8	5.5	4.2	23	12	5.6	5.7	2.1	1.5	2.1
17	7.6	8.1	8.6	5.0	4.4	36	12	5.7	4.5	2.1	1.5	2.0
18	8.2	8.0	7.0	4.5	4.5	68	11	5.8	3.7	2.3	1.5	1.9
19	7.9	8.8	6.5	4.0	4.5	46	11	6.1	3.2	2.2	1.8	1.9
20	7.1	9.0	8.0	4.0	4.5	35	11	6.0	3.1	2.2	2.7	2.0
21	8.8	8.3	10	4.0	4.5	28	11	5.3	3.1	2.2	2.7	2.0
22	7.5	8.0	9.5	4.5	4.5	18	10	4.5	3.2	2.1	2.1	2.0
23	7.4	8.0	8.0	4.5	4.6	15	11	4.9	3.2	2.1	1.9	2.0
24	8.6	7.0	6.5	5.0	4.6	14	10	5.3	3.4	3.3	1.8	2.3
25	8.2	7.3	6.5	5.2	4.6	15	9.5	5.3	3.5	3.1	1.6	3.1
26	8.1	5.6	7.0	5.4	4.6	16	9.4	13	3.4	2.7	1.6	3.5
27	7.7	6.7	7.0	5.6	4.6	14	9.5	16	4.2	2.6	1.5	3.6
28	6.7	7.6	7.5	5.2	5.0	13	9.5	13	4.4	2.3	1.9	3.6
29	6.8	7.8	7.0	5.0	---	12	9.2	11	4.2	2.3	5.4	3.7
30	7.7	8.0	5.5	5.0	---	13	8.8	9.4	4.6	2.4	2.7	3.6
31	7.8	---	5.0	3.5	---	11	---	8.5	---	3.5	2.1	---
TOTAL	269.6	232.1	241.6	160.3	104.2	466.3	337.7	226.5	156.6	82.8	65.5	69.3
MEAN	8.70	7.74	7.79	5.17	3.72	15.0	11.3	7.31	5.22	2.67	2.11	2.31
MAX	13	9.9	10	6.5	5.0	68	14	16	9.1	4.3	5.4	3.7
MIN	6.7	5.6	5.0	3.5	2.2	3.5	8.8	4.5	3.1	1.9	1.4	1.6
AC-FT	53	460	479	318	207	925	670	449	311	164	130	137
CAL YR 1984	TOTAL	8621.9		MEAN	23.6	MAX	138	MIN	5.0	AC-FT	17100	
WTR YR 1985	TOTAL	2412.5		MEAN	6.61	MAX	68	MIN	1.4	AC-FT	4790	

## CHEYENNE RIVER BASIN

73

06423010 BOXELDER CREEK NEAR RAPID CITY, SD

LOCATION.--Lat 44°07'54", long 103°17'54", in NW¼SE¼ sec.17, T.2 N., R.7 E., Pennington County, Hydrologic Unit 10120111, near center span on downstream side of bridge on State Highway 79, and 4.0 mi northwest of Rapid City.

DRAINAGE AREA.--128 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1978 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,450 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Considerable loss in sinkholes in reach above gage.

AVERAGE DISCHARGE.--7 years, 1.13 ft<sup>3</sup>/s (819 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 253 ft<sup>3</sup>/s May 18, 1978 (gage height, 31.14 ft), from flood-mark; maximum gage height, 31.51 ft May 7, 1983 (backwater from small dam); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--No flow during year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MEAN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
CAL YR 1984	TOTAL	1487.01		MEAN	4.06	MAX	60	MIN	.00	AC-FT	2950	
WTR YR 1985	TOTAL	.00		MEAN	.00	MAX	.00	MIN	.00	AC-FT	.00	

## CHEYENNE RIVER BASIN

06423500 CHEYENNE RIVER NEAR WASTA, SD

LOCATION.--Lat 44°04'52", long 102°24'03", in NE¼NE¼NW¼ sec.2, T.1 N., R.14 E., Pennington County, Hydrologic Unit 10120111, on left bank at downstream side of highway bridge, 200 ft downstream from Chicago and North Western Transportation Co. bridge, 3.0 mi east of Wasta, and 8.6 mi downstream from Boxelder Creek.

DRAINAGE AREA.--12,800 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1914 to June 1915, August 1928 to June 1932, March 1934 to current year. Monthly discharge only for some periods, published in WSP 1309. Records for Feb. 19-28, 1930, published in WSP 701, have been found to be unreliable and should not be used.

REVISED RECORDS.--WSP 786: Drainage area. WSP 1279: 1930(M), 1931, 1937. See also Period of Record.

GAGE.--Water-stage recorder. Datum of gage is 2,260.78 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 1, 1940, nonrecording gage at site 50 ft upstream; Aug. 1, 1940, to Dec. 3, 1940, nonrecording gage and Dec. 4, 1940, to Sept. 30, 1968, water-stage recorder at present site all at datum 2.00 ft higher. Oct. 1, 1968, to Sept. 30, 1972, at datum 1.00 ft higher.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 27 to Mar. 16, which are poor. Flow regulated by Angostura Dam 108 mi upstream since October 1949 and by upstream dams on Rapid Creek since August 1956. Several observations of water quality were made during the year. National Weather Service telemeter and U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--54 years (water years 1929-31, 1935-85), 343 ft<sup>3</sup>/s (248,500 acre-ft/yr); median of yearly mean discharges, 290 ft<sup>3</sup>/s (210,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge observed, 46,300 ft<sup>3</sup>/s May 6, 1932 (gage height, 13.28 ft), present datum, from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of an incomplete discharge measurement at gage height 10.65 ft, present datum; maximum gage height observed, 14.5 ft, present datum, June 13, 1915; minimum discharge, 0.6 ft<sup>3</sup>/s July 27, 1961.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1920 reached a stage of 18 ft, present datum, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,480 ft<sup>3</sup>/s at 1745 hours, Aug. 20 (gage height, 3.24 ft); maximum gage height, 4.08 ft Mar. 15 (backwater from ice); minimum daily discharge, 9.6 ft<sup>3</sup>/s July 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	142	130	110	90	70	200	201	170	68	74	172	52
2	140	158	96	110	60	180	207	98	75	67	121	53
3	140	155	84	130	50	170	192	75	86	48	98	50
4	134	149	84	150	46	160	200	70	77	50	82	61
5	127	147	76	180	50	180	268	63	81	35	68	61
6	123	145	80	160	52	190	226	59	93	25	79	56
7	146	147	86	150	54	200	199	58	93	22	79	49
8	141	144	100	140	56	200	180	53	102	19	88	243
9	131	160	130	130	58	210	168	51	81	14	64	599
10	128	165	170	110	60	250	168	47	79	15	50	163
11	126	150	160	96	66	300	158	48	307	11	52	107
12	122	150	140	110	80	350	158	47	160	10	91	103
13	124	160	140	120	90	500	155	64	142	9.6	178	102
14	127	160	150	140	110	680	151	80	106	12	120	100
15	125	160	170	140	110	900	149	82	79	21	74	100
16	127	157	150	150	110	660	144	72	73	126	63	98
17	128	156	105	150	110	545	145	59	62	280	66	95
18	137	146	100	140	115	576	145	59	51	148	63	91
19	140	152	110	110	115	513	149	55	43	80	69	95
20	144	144	150	100	115	383	149	54	33	56	581	96
21	147	145	150	110	120	327	163	62	31	51	396	103
22	142	154	140	120	130	317	161	65	28	61	171	101
23	138	155	120	130	150	297	154	53	24	51	117	107
24	138	158	88	150	170	273	138	45	20	38	100	168
25	139	158	100	150	180	229	128	44	27	38	90	129
26	137	151	120	140	180	221	117	50	33	69	80	115
27	139	150	130	130	170	215	136	117	38	64	63	105
28	138	150	110	110	180	208	154	135	47	49	56	100
29	143	140	100	100	---	199	152	95	63	184	54	104
30	148	130	88	95	---	200	174	76	45	195	95	113
31	143	---	84	80	---	197	---	71	---	396	64	---
TOTAL	4204	4526	3621	3921	2857	10030	4989	2177	2247	2318.6	3544	3519
MEAN	136	151	117	126	102	324	166	70.2	74.9	74.8	114	117
MAX	148	165	170	180	180	900	268	170	307	396	581	599
MIN	122	130	76	80	46	160	117	44	20	9.6	50	49
AC-FT	834	8980	7180	7780	5670	19890	9900	4320	4460	4600	7030	6980
CAL YR 1984	TOTAL	136479		MEAN	373	MAX	3680	MIN	45	AC-FT	270700	
WTR YR 1985	TOTAL	47953.6		MEAN	131	MAX	900	MIN	9.6	AC-FT	95120	

## CHEYENNE RIVER BASIN

75

## 06425100 ELK CREEK NEAR RAPID CITY, SD

LOCATION.--Lat 44°14'25", long 103°09'03", in NE¼NE¼ sec.9, T.3 N., R.8 E., Meade County, Hydrologic Unit 10120110, on section line near right upstream corner of county road bridge, 1.7 mi downstream from Morris Creek tributary, and 10 mi north of Exit 61 and I-90 northeast of Rapid City.

DRAINAGE AREA.--190 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1978 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,950 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period and/or no gage-height record, Dec. 14 to Feb. 21, which are poor. Some flow is pumped from stream for irrigation. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--6 years, 6.77 ft<sup>3</sup>/s (4,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,560 ft<sup>3</sup>/s May 20, 1982 (gage height, 10.79 ft); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	1900	*113	*6.83	No other peak greater than base discharge.			
No flow for many days.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	6.5	7.7	4.2	3.3	7.0	8.7	3.8	1.9	.82	.00	.00
2	8.0	7.0	8.7	4.6	3.3	7.0	9.2	3.8	1.8	.67	.00	.00
3	7.6	7.5	6.2	5.2	3.5	6.0	8.6	3.6	2.1	.59	.00	.00
4	7.6	7.5	6.2	6.0	3.6	5.2	8.3	3.4	2.5	.42	.00	.00
5	7.8	7.5	6.0	6.4	3.7	5.0	7.9	2.8	2.8	.31	.00	.00
6	8.2	7.4	5.5	6.4	3.8	6.0	7.6	2.7	2.8	.23	.00	.00
7	7.8	7.5	5.5	6.4	3.9	7.0	7.3	2.6	2.6	.13	.00	.00
8	7.5	7.3	6.0	6.0	4.0	8.0	6.9	2.6	2.0	.01	.00	.00
9	7.4	7.0	7.0	5.1	3.9	10	6.7	2.5	1.5	.00	.00	.00
10	7.5	7.0	7.5	4.8	3.6	12	6.7	2.4	1.5	.00	.00	.00
11	7.5	8.1	8.4	4.5	3.8	15	6.6	2.5	1.7	.00	.00	.00
12	7.3	8.8	7.6	4.5	3.9	19	6.4	2.5	2.2	.00	.00	.00
13	7.0	8.3	7.0	5.0	4.2	17	6.1	2.5	2.3	.00	.00	.00
14	6.9	8.6	6.7	5.6	5.2	14	5.9	2.6	1.9	.00	.00	.00
15	6.6	8.2	6.4	5.8	7.2	13	5.6	2.6	1.7	.00	.00	.00
16	6.7	7.1	5.8	6.0	8.2	12	5.4	2.4	1.4	.00	.00	.00
17	6.8	7.8	5.4	6.2	7.7	33	5.4	2.6	1.2	.00	.00	.00
18	7.3	7.1	5.2	5.6	7.4	59	5.3	2.5	.92	.00	.00	.00
19	7.4	6.6	5.2	5.1	7.2	34	5.0	2.4	.79	.00	.00	.00
20	7.4	6.9	5.4	4.7	7.1	26	4.7	2.2	.77	.00	.00	.00
21	7.5	7.2	5.4	4.7	7.1	21	4.8	1.9	.75	.00	.00	.00
22	7.5	7.1	4.8	5.2	7.2	18	5.0	1.8	.65	.00	.00	.00
23	7.4	7.4	4.1	5.4	6.5	18	5.0	1.8	.68	.00	.00	.00
24	7.7	7.4	3.6	5.4	7.6	18	4.7	1.7	.51	.00	.00	.00
25	7.7	7.4	3.8	5.4	6.9	13	4.2	1.6	.47	.00	.00	.00
26	7.9	7.0	4.2	5.2	7.0	11	4.0	2.0	.54	.00	.00	.00
27	7.8	7.0	5.2	5.0	7.0	9.3	4.1	2.7	.59	.00	.00	.00
28	7.4	6.6	4.6	4.5	7.0	9.0	4.1	3.3	.51	.00	.00	.00
29	7.6	8.7	4.2	4.0	---	8.4	3.9	3.0	.70	.00	.00	.00
30	7.4	8.4	4.0	3.5	---	7.2	3.5	2.7	1.0	.00	.00	.00
31	7.4	---	4.0	3.2	---	7.8	---	2.3	---	.00	.00	---
TOTAL	231.7	223.9	177.3	159.6	154.8	455.9	177.6	79.8	42.78	3.18	.00	.00
MEAN	7.47	7.46	5.72	5.15	5.53	14.7	5.92	2.57	1.43	.10	.00	.00
MAX	8.2	8.8	8.7	6.4	8.2	59	9.2	3.8	2.8	.82	.00	.00
MIN	6.6	6.5	3.6	3.2	3.3	5.0	3.5	1.6	.47	.00	.00	.00
AC-FT	46	444	352	317	307	904	352	158	85	6.3	.00	.00
CAL YR 1984	TOTAL	6352.2	MEAN	17.4	MAX	515	MIN	1.3	AC-FT	12600		
WTR YR 1985	TOTAL	1706.56	MEAN	4.68	MAX	59	MIN	.00	AC-FT	3380		



## CHEYENNE RIVER BASIN

06425500 ELK CREEK NEAR ELM SPRINGS, SD

LOCATION.--Lat 44°14'54", long 102°30'10", in SW¼NW¼ sec.1, T.3 N., R.13 E., Meade County, Hydrologic Unit 10120111, on left bank near downstream end of county highway bridge, 1.4 mi downstream from Hay Draw, 5.0 mi southeast of Elm Springs, and 7.0 mi upstream from mouth.

DRAINAGE AREA.--540 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,304.49 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 2, 1976, nonrecording gage, and prior to Feb. 1, 1967, at site 350 ft downstream at present datum.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 28 to Mar. 22, which are poor.

AVERAGE DISCHARGE.--36 years, 22.5 ft<sup>3</sup>/s (16,300 acre-ft/yr); median of yearly mean discharges, 20 ft<sup>3</sup>/s (14,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft<sup>3</sup>/s Mar. 29, 1952 (gage height, 10.61 ft), from floodmarks, site and datum then in use, from rating curve extended above 5,100 ft<sup>3</sup>/s; maximum gage height, 12.33 ft May 21, 1982; no flow for long periods in each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, about 17 ft, at former site, in May 1920, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 28	unknown	a	*5.84	Mar. 20	unknown	*73	5.50

a Backwater from ice.  
No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	5.0	4.5	3.3	2.0	6.9	12	3.0	.08	.00	.00	.00
2	.01	4.7	3.8	3.7	2.1	6.2	12	2.9	.07	.00	.00	.00
3	.01	6.3	3.7	4.1	2.3	5.8	13	2.8	.30	.00	.00	.00
4	.01	5.1	3.8	4.5	2.4	5.4	15	2.6	.39	.00	.00	.00
5	.30	4.8	3.9	5.0	2.5	5.0	12	2.3	.26	.00	.00	.00
6	.70	5.2	4.5	4.8	2.7	7.0	10	1.8	.18	.00	.00	.00
7	3.3	5.4	5.0	4.5	2.9	12	9.7	1.6	.10	.00	.00	.00
8	3.7	5.3	5.4	4.2	3.2	16	9.8	1.6	.04	.00	.00	.00
9	3.6	5.2	6.0	3.9	3.0	17	9.5	1.6	.03	.00	.00	.00
10	3.5	5.2	6.3	3.7	2.8	16	8.3	1.5	.05	.00	.00	.00
11	3.5	5.2	6.0	3.5	3.0	20	7.4	1.6	.05	.00	.00	.00
12	3.4	5.6	5.4	4.0	3.4	23	7.6	1.6	.04	.00	.00	.00
13	3.3	5.7	5.4	4.5	3.6	26	6.5	.69	.01	.00	.00	.00
14	3.3	5.9	5.8	4.9	3.9	30	6.2	.58	.00	.00	.00	.00
15	3.2	5.4	6.0	5.3	4.4	35	6.5	.76	.00	.00	.00	.00
16	3.4	6.4	5.6	5.6	4.6	41	5.6	.54	.00	.00	.00	.00
17	3.4	7.5	4.5	5.6	4.9	50	5.1	.31	.00	.00	.00	.00
18	3.6	6.3	4.0	5.2	5.2	60	5.2	.36	.00	.00	.00	.00
19	3.7	7.5	4.4	4.8	5.4	70	5.3	.30	.00	.00	.00	.00
20	3.7	8.0	5.0	4.5	5.6	70	7.6	.16	.00	.00	.00	.00
21	3.7	11	5.4	4.7	5.6	70	7.2	.03	.00	.00	.00	.00
22	3.8	13	4.5	5.0	5.5	49	5.6	.01	.00	.00	.00	.00
23	4.1	13	3.7	5.2	5.4	39	5.1	.06	.00	.00	.00	.00
24	4.3	9.7	3.2	5.5	5.4	28	4.8	.00	.00	.00	.00	.00
25	4.4	8.7	4.0	6.0	5.4	23	4.8	.00	.00	.00	.00	.00
26	4.7	7.0	5.0	5.5	5.2	25	4.5	.18	.00	.00	.00	.00
27	4.9	4.8	6.0	4.5	6.2	23	4.4	.37	.00	.00	.00	.00
28	4.9	4.9	5.0	3.5	7.6	19	4.1	.30	.00	.00	.00	.00
29	4.9	5.4	4.5	2.5	---	15	3.6	.21	.00	.00	.00	.00
30	4.8	5.2	3.8	2.1	---	16	3.2	.18	.00	.00	.00	.00
31	4.8	---	3.5	2.0	---	13	---	.15	---	.00	.00	---
TOTAL	98.94	198.4	147.6	136.1	116.2	842.3	221.6	30.09	1.60	.00	.00	.00
MEAN	3.19	6.61	4.76	4.39	4.15	27.2	7.39	.97	.05	.00	.00	.00
MAX	4.9	13	6.3	6.0	7.6	70	15	3.0	.39	.00	.00	.00
MIN	.01	4.7	3.2	2.0	2.0	5.0	3.2	.00	.00	.00	.00	.00
AC-FT	19	394	293	270	230	1670	440	60	3.2	.00	.00	.00
CAL YR 1984 TOTAL	9815.39			MEAN	26.8	MAX	813	MIN	.00	AC-FT	19470	
WTR YR 1985 TOTAL	1792.83			MEAN	4.91	MAX	70	MIN	.00	AC-FT	3560	

## CHEYENNE RIVER BASIN

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## 06427000 KEYHOLE RESERVOIR NEAR MOORCROFT, WY

LOCATION.--Lat 44°22'55", long 104°46'45", in NW¼NW¼ sec.27, T.51 N., R.66 W., Crook County, Hydrologic Unit 10120201, at reservoir dam on Belle Fourche River 12 mi northeast of Moorcroft.

DRAINAGE AREA.--2,000 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--March 1952 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Bureau of Reclamation datum). Prior to May 15, 1958, and Oct. 1, 1968, to Mar. 13, 1970, nonrecording gages, and May 15, 1958, to Sept. 30, 1968, water-stage recorder, all at present site and datum.

REMARKS.--Reservoir is formed by a zoned earth-fill dam completed by the Bureau of Reclamation Oct. 25, 1952. Storage began Feb. 12, 1952. Inactive storage, between elevations 4,036.0 ft and 4,051.0 ft, 7,952 acre-ft. Total capacity below elevation 4,099.3 ft (crest of spillway), 185,800 acre-ft. Siltation has eliminated dead storage. Figures given herein represent active contents. The reservoir provides flood control and water for irrigation in Wyoming and near Belle Fourche, SD.

COOPERATION.--Records of elevation and contents provided by the Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 200,744 acre-ft May 21, 1978 (elevation, 4,100.38 ft); minimum daily contents (since appreciable storage was attained), 6,030 acre-ft Mar. 8, 9, 1955 (elevation, 4,046.35 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 74,899 acre-ft Apr. 19, 20 (elevation, 4,083.02 ft); minimum, 48,051 acre-ft Sept. 29, 30 (elevation, 4,076.26 ft).

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	4,082.49	72,473	-
Oct. 31 . . . . .	4,082.25	71,394	-1,079
Nov. 30 . . . . .	4,082.26	71,439	+45
Dec. 31 . . . . .	4,082.26	71,439	0
CAL YR 1984 . . . . .	-	-	+28,184
Jan. 31 . . . . .	4,082.24	71,350	-89
Feb. 28 . . . . .	4,082.23	71,305	-45
Mar. 31 . . . . .	4,082.93	74,482	+3,177
Apr. 30 . . . . .	4,082.94	74,529	+47
May 31 . . . . .	4,081.83	69,537	-4,992
June 30 . . . . .	4,080.87	65,434	-4,103
July 31 . . . . .	4,078.21	55,002	-10,432
Aug. 31 . . . . .	4,076.69	49,535	-5,467
Sept. 30 . . . . .	4,076.26	48,051	-1,484
WTR YR 1985 . . . . .	-	-	-24,422

## CHEYENNE RIVER BASIN

06428500 BELLE FOURCHE RIVER AT WYOMING-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 44°44'59", long 104°02'49", in NE1/4NW1/4 sec.18, T.9 N., R.1 E., Butte County, Hydrologic Unit 10120202, on left bank 0.3 mi downstream from State line, 3.7 mi downstream from Oak Creek, and 11 mi north-west of Belle Fourche, SD.

DRAINAGE AREA.--3,280 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1946 to current year. Records for water year 1947 incomplete, yearly estimate published in WSP 1729.

GAGE.--Water-stage recorder. Datum of gage is 3,095.7 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period and/or no gage-height record, Nov. 26 to Mar. 19, which are poor. Diversions above station for irrigation of about 5,400 acres. Flow regulated by Keyhole Dam, usable capacity, 191,600 acre-ft, 143 mi upstream since Oct. 25, 1952. Water-quality records for the station are published in the annual report "Water Resources Data for Wyoming."

AVERAGE DISCHARGE.--39 years, 90.3 ft<sup>3</sup>/s (65,420 acre-ft/yr); median of yearly mean discharges, 86 ft<sup>3</sup>/s (62,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,400 ft<sup>3</sup>/s June 18, 1962 (gage height, 15.59 ft); no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 615 ft<sup>3</sup>/s at 0045 hours, Mar. 20 (gage height, 6.86 ft); maximum gage height, 8.77 ft Mar. 17 (backwater from ice); minimum daily discharge, 4.0 ft<sup>3</sup>/s Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	24	23	12	4.5	12	78	36	85	85	144	37
2	23	26	21	14	5.5	11	78	35	88	83	133	40
3	23	26	20	15	5.0	9.0	74	34	79	83	128	40
4	23	29	20	16	5.0	8.8	79	33	74	81	105	39
5	24	34	20	17	5.2	12	76	32	72	82	82	39
6	48	29	21	15	5.4	16	79	29	70	85	78	38
7	35	30	32	15	5.4	19	75	28	68	83	78	28
8	28	27	30	13	5.6	21	70	27	63	87	87	22
9	27	25	29	11	6.0	21	69	26	47	80	74	19
10	28	22	29	10	6.2	26	66	26	36	70	62	16
11	28	24	25	10	6.6	34	62	27	29	59	50	16
12	27	26	23	11	6.8	41	58	28	23	57	40	16
13	26	29	21	13	6.8	66	56	27	20	57	37	17
14	25	31	20	14	8.0	100	56	28	19	57	33	16
15	24	34	20	13	9.0	170	60	26	20	64	35	16
16	23	33	18	14	10	300	58	28	17	66	30	15
17	23	32	16	15	11	350	57	143	16	70	29	15
18	24	30	15	12	10	400	53	160	15	70	28	15
19	23	31	16	9.5	12	450	54	137	14	89	34	14
20	23	33	18	10	13	510	52	125	14	96	40	15
21	23	41	17	12	11	304	50	119	14	101	41	15
22	23	44	17	13	11	217	54	117	18	100	45	15
23	27	41	17	15	10	158	55	118	14	102	45	15
24	28	42	15	15	11	151	50	117	31	95	43	15
25	27	35	16	14	11	150	46	115	80	100	40	18
26	28	32	17	13	9.5	157	44	123	79	98	40	19
27	27	28	19	13	10	120	43	111	80	109	40	19
28	26	26	17	12	12	121	42	97	85	117	40	20
29	25	25	15	11	---	87	40	92	85	123	39	20
30	23	25	13	6.2	---	86	38	86	84	124	40	19
31	22	---	10	4.0	---	86	---	82	---	145	38	---
TOTAL	809	914	610	387.7	232.5	4213.8	1772	2212	1439	2718	1778	648
MEAN	26.1	30.5	19.7	12.5	8.30	136	59.1	71.4	48.0	87.7	57.4	21.6
MAX	48	44	32	17	13	510	79	160	88	145	144	40
MIN	22	22	10	4.0	4.5	8.8	38	26	14	57	28	14
AC-FT	160	1810	1210	769	461	8360	3510	4390	2850	5390	3530	1290
CAL YR 1984	TOTAL	51718.6		MEAN	141	MAX	2830	MIN	7.4	AC-FT	102600	
WTR YR 1985	TOTAL	17734.0		MEAN	48.6	MAX	510	MIN	4.0	AC-FT	35180	

## CHEYENNE RIVER BASIN

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

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1965 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE LAB (UMHOS)	TEMPER- ATURE (DEG C)	HARD- NESS (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
OCT 1984										
11...	0915	28	1980	12.5	1000	290	76	120	2	8.3
JAN 1985										
09...	1030	11	2440	.5	1200	330	100	140	2	8.5
MAY										
16...	1330	25	2050	19.5	1100	290	80	120	2	9.9
JUN										
05...	0730	73	1430	14.0	530	140	44	130	3	8.2

DATE	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)
OCT 1984										
11...	150	1100	11	.50	2.8	1700	2.3	128	.00	.070
JAN 1985										
09...	270	1200	9.7	.20	7.0	1900	2.6	58	.00	.000
MAY										
16...	170	1100	7.7	.20	3.1	1700	2.4	117	.00	.270
JUN										
05...	150	600	19	.40	3.1	1000	1.4	204	.00	.450



## CHEYENNE RIVER BASIN

## 06430000 MURRAY DITCH AT WYOMING-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 44°34'35", long 104°02'58", in SW¼SW¼ sec.7, T.7 N., R.1 E., Butte County, Hydrologic Unit 10120203, on right bank 15 ft downstream from State line and 12 mi southwest of Belle Fourche, SD.

PERIOD OF RECORD.--June 1954 to current year (irrigation seasons only prior to October 1959).

GAGE.--Water-stage recorder. Elevation of gage is 3,440 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Ditch diverts water from left bank of Redwater Creek, 2.0 mi upstream, for irrigation of about 700 acres. Flow maintained during irrigation season only. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 37 ft<sup>3</sup>/s July 17, 1973; no flow for long periods in each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	1.0	.00	.00	.00	.00	.00	1.0	13	9.9	9.4	13
2	7.3	1.0	.00	.00	.00	.00	.00	8.0	13	13	8.9	16
3	3.1	1.0	.00	.00	.00	.00	.00	8.1	13	11	8.8	14
4	2.0	1.0	.00	.00	.00	.00	.00	8.4	18	9.3	10	14
5	1.5	3.1	.00	.00	.00	.00	.00	8.8	18	11	8.8	14
6	1.0	3.0	.00	.00	.00	.00	.00	13	21	12	8.9	13
7	1.0	2.8	.00	.00	.00	.00	.00	14	25	9.8	11	13
8	1.0	1.0	.00	.00	.00	.00	.00	15	24	10	15	13
9	1.0	2.0	.00	.00	.00	.00	.00	12	26	11	23	13
10	1.0	2.9	.00	.00	.00	.00	.00	9.5	26	9.2	18	14
11	1.0	2.8	.00	.00	.00	.00	.00	11	26	8.8	17	14
12	1.0	.50	.00	.00	.00	.00	.00	10	26	8.9	21	13
13	1.0	.00	.00	.00	.00	.00	.00	11	21	7.7	16	14
14	1.0	.00	.00	.00	.00	.00	.00	12	16	6.0	13	15
15	1.0	.00	.00	.00	.00	.00	.00	14	12	2.6	17	15
16	14	.00	.00	.00	.00	.00	.00	14	11	.00	14	15
17	21	.00	.00	.00	.00	.00	.00	14	8.6	.00	14	15
18	21	.00	.00	.00	.00	.00	.00	15	9.0	.00	15	15
19	21	.00	.00	.00	.00	.00	.00	14	9.7	.00	15	16
20	22	.00	.00	.00	.00	.00	.00	15	10	.00	16	15
21	20	.00	.00	.00	.00	.00	.00	14	12	.00	16	15
22	21	.00	.00	.00	.00	.00	.00	17	13	9.3	19	15
23	22	.00	.00	.00	.00	.00	.00	18	12	16	21	15
24	23	.00	.00	.00	.00	.00	.00	19	12	16	14	15
25	24	.00	.00	.00	.00	.00	.00	21	11	18	15	15
26	27	.00	.00	.00	.00	.00	.00	23	11	18	15	15
27	23	.00	.00	.00	.00	.00	.00	21	11	19	9.5	15
28	6.3	.00	.00	.00	.00	.00	.00	24	10	21	9.7	15
29	6.2	.00	.00	.00	---	.00	.00	18	10	23	10	15
30	2.5	.00	.00	.00	---	.00	.00	16	9.1	13	10	15
31	1.0	---	.00	.00	---	.00	---	14	---	11	10	---
TOTAL	311.9	22.10	.00	.00	.00	.00	.00	432.8	457.4	304.50	429.0	434
MEAN	10.1	.74	.00	.00	.00	.00	.00	14.0	15.2	9.82	13.8	14.5
MAX	27	3.1	.00	.00	.00	.00	.00	24	26	23	23	16
MIN	1.0	.00	.00	.00	.00	.00	.00	1.0	8.6	.00	8.8	13
AC-FT	61	44	.00	.00	.00	.00	.00	858	907	604	851	861
CAL YR 1984	TOTAL	1612.25	MEAN	4.41	MAX	35	MIN	.00	AC-FT	3200		
WTR YR 1985	TOTAL	2391.70	MEAN	6.55	MAX	27	MIN	.00	AC-FT	4740		

## 06430500 REDWATER CREEK AT WYOMING-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 44°34'26", long 104°02'54", in NW¼NW¼ sec.18 T.7 N., R.1 E., Butte County, Hydrologic Unit 10120203, on left bank 800 ft downstream from State line, 5.7 mi upstream from Crow Creek, and 12 mi southwest of Belle Fourche, SD.

DRAINAGE AREA.--471 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1929 to September 1931 and February 1936 to July 1937 (published as "near Beulah, WY"), June 1954 to current year.

REVISED RECORDS.--WSP 1309: 1931(M), 1936-37(M).

GAGE.--Water-stage recorder. Elevation of gage is 3,410 ft above National Geodetic Vertical Datum of 1929, from topographic map. Apr. 25, 1929, to Sept. 30, 1931, and Feb. 28, 1936, to July 31, 1937, nonrecording gage at site 2 mi upstream at different datum.

REMARKS.--Records good except those for winter period, which are fair. Large diversions for irrigation upstream from station. Total flow passing State line may be obtained by adding flow of Murray ditch (see station 06430000). Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--33 years, 35.6 ft<sup>3</sup>/s (25,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,440 ft<sup>3</sup>/s Aug. 22, 1973 (gage height, 12.19 ft), from rating curve extended above 1,000 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 11.95 ft; no flow Aug. 13-15, 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 4	1130	*78	3.07	Dec. 19	--	a	*3.86

a Backwater from ice.

Minimum daily discharge, 1.3 ft<sup>3</sup>/s May 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	34	36	35	22	31	32	35	2.7	11	4.0	13
2	26	34	34	34	24	31	32	30	4.4	15	4.7	9.4
3	32	35	34	34	26	31	33	22	4.6	15	5.4	11
4	37	32	34	32	26	31	34	26	5.9	16	5.8	14
5	36	30	35	33	27	32	33	25	8.1	16	5.6	14
6	38	30	34	33	27	32	32	21	7.0	7.6	5.8	13
7	35	32	34	33	28	32	32	12	8.4	3.3	6.4	13
8	34	32	34	32	29	32	32	3.7	3.9	3.9	8.7	13
9	34	34	34	32	31	33	33	4.0	8.7	4.7	7.5	13
10	34	32	34	32	32	33	33	2.2	12	6.5	5.5	13
11	35	32	35	32	32	35	34	2.1	11	6.4	5.3	13
12	35	34	35	33	30	34	34	2.4	9.5	6.6	5.0	10
13	34	36	35	32	30	32	34	2.4	9.3	6.2	4.2	8.4
14	34	36	34	31	30	32	34	2.4	13	7.3	3.2	7.7
15	34	35	34	31	30	32	35	2.8	19	22	4.6	7.7
16	32	36	34	32	30	33	34	2.9	22	34	3.9	8.0
17	28	36	33	32	29	35	35	3.0	26	32	4.7	8.8
18	28	36	33	32	30	34	35	3.8	26	30	5.8	8.4
19	28	36	33	32	30	32	35	3.5	24	28	5.3	12
20	28	36	36	31	30	30	35	3.2	14	27	3.6	13
21	28	36	33	33	30	31	35	2.2	13	24	3.8	13
22	27	35	33	32	31	31	35	1.3	20	13	3.6	13
23	27	35	34	32	30	31	35	1.4	20	4.4	3.5	13
24	27	36	33	32	30	31	35	1.5	18	5.4	8.4	13
25	28	36	34	30	30	32	35	1.7	11	4.0	11	13
26	27	35	34	30	30	32	35	2.5	12	4.7	11	13
27	27	33	35	30	30	32	35	2.6	15	8.2	12	13
28	27	34	34	31	31	31	35	2.6	14	8.5	12	13
29	27	35	35	30	---	31	35	1.6	16	4.9	14	13
30	30	35	35	26	---	31	35	1.8	14	3.0	13	14
31	35	---	35	24	---	32	---	2.1	---	3.3	13	---
TOTAL	952	1028	1060	978	815	992	1021	230.7	392.5	381.9	210.3	354.4
MEAN	30.7	34.3	34.2	31.5	29.1	32.0	34.0	7.44	13.1	12.3	6.78	11.8
MAX	38	36	36	35	32	35	35	35	26	34	14	14
MIN	20	30	33	24	22	30	32	1.3	2.7	3.0	3.2	7.7
AC-FT	189	2040	2100	1940	1620	1970	2030	458	779	757	417	703
CAL YR 1984	TOTAL	13348.8		MEAN	36.5	MAX	497	MIN	5.1	AC-FT	26480	
WTR YR 1985	TOTAL	8415.8		MEAN	23.1	MAX	38	MIN	1.3	AC-FT	16690	

## CHEYENNE RIVER BASIN

06431500 SPEARFISH CREEK AT SPEARFISH, SD

LOCATION.--Lat 44°28'57", long 103°51'40", in SE¼NW¼ sec.15, T.6 N., R.2 E., Lawrence County, Hydrologic Unit 10120203, on right bank in city park in Spearfish, 500 ft downstream from fish hatchery and nearest tributary, and 9.8 mi upstream from mouth.

DRAINAGE AREA.--168 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1946 to current year.

REVISED RECORDS.--WSP 1116: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,640 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Dec. 5, 1946, nonrecording gage at same site and datum.

REMARKS.--Records good. Regulation by fish hatchery and by hydroelectric plant 0.5 mi upstream causes diurnal fluctuation, but since storage capacity is small, daily flows are not appreciably affected. Upstream diversions out of drainage basin to Whitewood Creek basin by the Homestake Mining Co. average about 10 ft<sup>3</sup>/s. Figures of daily discharge do not include diversion by Homestake Mining Co. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--39 years, 52.9 ft<sup>3</sup>/s (38,330 acre-ft/yr), unadjusted.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,240 ft<sup>3</sup>/s May 15, 1965 (gage height, 10.53 ft), from rating curve extended above 520 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; maximum gage height, 10.54 ft June 15, 1976; no flow for part of Oct. 18, 1970.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 5, 1904, reached a stage of 7.00 ft, site and datum of former gage near Spearfish, 1 mi upstream, drainage area, 157 mi<sup>2</sup>; discharge about 5,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 89 ft<sup>3</sup>/s at 0900 hours, Apr. 17 (gage height, 6.59 ft); maximum gage height, 8.33 ft Feb. 1 (backwater from ice); minimum daily, 29 ft<sup>3</sup>/s Feb. 1, July 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	51	52	48	29	48	50	50	50	44	41	40
2	46	52	50	50	30	48	52	50	51	43	41	39
3	45	52	50	49	30	47	53	49	51	43	41	43
4	42	54	50	46	31	49	57	49	51	41	39	40
5	43	54	51	45	31	51	50	49	47	43	40	40
6	45	53	52	46	31	52	50	51	49	42	39	41
7	45	54	51	45	32	51	50	48	49	41	38	39
8	45	55	49	46	32	47	48	47	50	42	38	39
9	44	57	51	45	33	48	51	48	50	37	38	40
10	44	53	50	44	34	50	51	50	49	29	39	39
11	44	55	46	45	36	50	56	47	50	29	39	39
12	44	55	48	47	36	48	63	52	48	40	39	38
13	45	56	47	49	40	48	63	53	47	38	38	39
14	46	55	48	47	42	48	63	51	47	41	39	38
15	46	53	48	45	43	49	62	50	48	42	38	38
16	49	55	48	46	44	50	60	48	47	39	36	38
17	47	56	48	47	46	49	59	49	49	42	37	39
18	50	55	47	46	47	50	63	50	47	42	39	40
19	48	56	45	46	46	50	60	52	39	40	38	39
20	49	56	52	46	47	47	64	51	37	43	38	40
21	50	54	53	45	47	51	61	49	49	42	38	41
22	50	54	50	45	47	52	56	51	51	41	39	42
23	51	53	48	49	48	48	56	51	46	42	39	46
24	52	54	47	51	48	49	53	48	45	42	40	46
25	51	53	50	49	47	51	52	46	45	44	40	48
26	52	54	50	47	47	51	51	53	47	44	37	46
27	52	50	49	47	47	51	51	53	48	39	37	47
28	52	53	48	50	48	50	51	54	43	42	37	46
29	53	52	45	47	---	48	51	50	46	39	37	46
30	53	52	46	36	---	49	49	49	45	42	37	46
31	52	---	46	31	---	50	---	52	---	43	38	---
TOTAL	1482	1616	1515	1425	1119	1530	1656	1550	1421	1261	1194	1242
MEAN	47.8	53.9	48.9	46.0	40.0	49.4	55.2	50.0	47.4	40.7	38.5	41.4
MAX	53	57	53	51	48	52	64	54	51	44	41	48
MIN	42	50	45	31	29	47	48	46	37	29	36	38
AC-FT	294	3210	3010	2830	2220	3030	3280	3070	2820	2500	2370	2460
CAL YR 1984 TOTAL	24591			MEAN	67.2	MAX	233	MIN	38	AC-FT	48780	
WTR YR 1985 TOTAL	17011			MEAN	46.6	MAX	64	MIN	29	AC-FT	33740	

## 06433000 REDWATER RIVER ABOVE BELLE FOURCHE, SD

LOCATION.--Lat 44°40'02", long 103°50'20", in NW¼SE¼ sec.11, T.8 N., R.2 E., Butte County, Hydrologic Unit 10120203, on right bank at upstream side of bridge on U.S. Highway 212 in Belle Fourche, 0.5 mi upstream from Hay Creek, and 0.9 mi upstream from mouth.

DRAINAGE AREA.--920 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1945 to current year. Records for water year 1946 incomplete, yearly discharge published in WSP 1309. Prior to October 1960, published as Redwater Creek above Belle Fourche.

REVISED RECORDS.--WSP 1389: 1954 (maximum gage height only).

GAGE.--Water-stage recorder. Elevation of gage is 3,000 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Dec. 13, 1946, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of ice and/or no gage-height record, Dec. 13 to Jan. 16 and Jan. 29 to Feb. 22, which are poor. Diversions for irrigation of about 13,000 acres above station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--40 years, 137 ft<sup>3</sup>/s (99,260 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,400 ft<sup>3</sup>/s June 16, 1962 (gage height, 11.69 ft), from rating curve extended above 6,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in 1960, 1968-69, 1981-82.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 5	--	*210	a3.08	Feb. 3	unknown	unknown	b*10.99

a Backwater from ice.

b Maximum observed, caused by glaciating ice.

Minimum daily discharge, 0.76 ft<sup>3</sup>/s July 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	160	142	130	56	152	145	117	4.2	15	12	20
2	135	160	142	150	60	152	145	124	5.1	15	10	17
3	132	160	140	160	64	155	144	109	14	12	9.7	20
4	135	165	150	180	64	137	154	110	18	11	11	30
5	138	170	150	200	74	130	146	107	27	11	11	39
6	152	160	155	190	88	132	142	105	27	10	13	37
7	142	165	160	180	110	140	137	91	28	10	10	36
8	142	165	150	180	130	147	133	53	31	9.8	11	36
9	142	171	144	170	150	148	133	28	28	8.7	11	39
10	148	163	146	160	140	148	136	16	34	7.0	6.0	39
11	159	158	146	150	150	151	138	19	47	5.6	9.0	43
12	180	165	142	130	155	152	142	22	45	2.3	8.9	46
13	178	169	140	140	150	152	149	21	43	1.7	7.4	43
14	177	170	130	120	160	155	146	17	44	.76	7.1	46
15	173	122	150	110	160	177	146	15	40	1.6	7.8	48
16	175	116	140	120	150	184	143	12	34	1.8	11	46
17	173	118	130	121	140	184	145	8.8	36	5.2	39	47
18	170	119	150	95	140	180	145	7.7	37	5.8	61	46
19	170	120	155	108	150	180	147	6.4	32	7.0	62	47
20	167	117	160	86	160	180	154	5.5	26	7.4	40	80
21	166	117	165	94	180	170	143	4.2	15	7.9	21	105
22	163	124	160	98	170	155	140	3.2	13	9.2	19	107
23	160	124	150	110	148	151	136	2.7	13	7.6	22	114
24	159	129	150	110	148	149	133	3.2	14	7.7	22	121
25	163	132	160	100	151	152	134	3.0	12	5.1	23	132
26	162	132	165	94	148	153	132	4.5	13	5.5	26	134
27	165	130	165	88	148	148	131	3.7	14	6.4	24	131
28	170	140	160	88	152	146	130	3.8	9.4	5.2	22	136
29	165	139	130	80	---	140	128	4.0	12	6.9	22	134
30	165	137	100	75	---	137	120	4.1	14	8.8	26	135
31	160	---	110	60	---	141	---	4.1	---	12	25	---
TOTAL	4921	4317	4537	3877	3696	4778	4197	1034.9	729.7	230.96	609.9	2054
MEAN	159	144	146	125	132	154	140	33.4	24.3	7.45	19.7	68.5
MAX	180	171	165	200	180	184	154	124	47	15	62	136
MIN	132	116	100	60	56	130	120	2.7	4.2	.76	6.0	17
AC-FT	976	8560	9000	7690	7330	9480	8320	2050	1450	458	1210	4070

CAL YR 1984	TOTAL	64557	MEAN	176	MAX	1200	MIN	17	AC-FT	128000
WTR YR 1985	TOTAL	34982.46	MEAN	95.8	MAX	200	MIN	.76	AC-FT	69390



## CHEYENNE RIVER BASIN

06433500 HAY CREEK AT BELLE FOURCHE, SD

LOCATION.--Lat 44°40'01", long 103°50'46", in NW¼SW¼ sec.11, T.8 N., R.2 E., Butte County, Hydrologic Unit 10120203, on right bank at intersection of Tenth Avenue and Jackson Street in Belle Fourche, 0.5 mi upstream from mouth.

DRAINAGE AREA.--121 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1953 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,005.18 ft above National Geodetic Vertical Datum of 1929 (City of Belle Fourche bench mark). Prior to Dec. 8, 1953, nonrecording gage at site 300 ft downstream at same datum.

REMARKS.--Records good. Minor diversion to the stream at times from city reservoir overflow, which enters stream upstream from gage. One observation of water temperature and specific conductance was made during the year.

AVERAGE DISCHARGE.--32 years, 1.55 ft<sup>3</sup>/s (1,120 acre-ft/yr); median of yearly mean discharges, 1.0 ft<sup>3</sup>/s (720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 930 ft<sup>3</sup>/s June 19, 1972 (gage height, 9.15 ft); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 15	--	a	*5.00	Mar. 19	0845	*18	4.05

a Backwater from ice.  
No flow for many days.

## DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN VALUES											
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.02	.00	.00	.00	1.1	.54	.00	.00	.00	.00
2	.00	.00	.01	.00	.00	.00	1.0	.44	.18	.00	.00	.00
3	.00	.00	.01	.00	.00	.00	1.1	.16	.31	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	1.5	.16	.11	.00	.00	.00
5	.81	.00	.00	.00	.00	.00	1.4	.12	.08	.00	.06	.00
6	.65	.00	.00	.00	.00	.00	1.4	.06	.05	.00	.09	.00
7	.28	.00	.00	.00	.00	.00	1.2	.04	.08	.00	.00	.00
8	.03	.00	.00	.00	.00	.00	1.1	.02	.03	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	1.0	.07	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	1.1	.29	.76	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.98	.49	.54	.00	.00	.00
12	.00	.02	.00	.00	.00	.00	1.0	.32	.58	.00	.00	.00
13	.00	.02	.00	.00	.00	.00	1.0	.16	.25	.00	.00	.00
14	.00	.33	.00	.00	.00	.00	.98	.17	.17	.00	.31	.00
15	.00	.21	.00	.00	.00	.12	.92	.09	.10	.00	.06	.00
16	.00	.13	.00	.00	.00	.40	1.1	.02	.05	.00	.00	.00
17	.00	.12	.00	.00	.00	2.0	1.2	.11	.01	.00	.00	.00
18	.00	.11	.00	.00	.00	8.0	1.3	.02	.00	.00	.18	.00
19	.00	.07	.00	.00	.00	13	1.4	.00	.00	.00	.00	.00
20	.00	.05	.00	.00	.00	10	1.3	.00	.07	.00	.00	.00
21	.00	.05	.00	.00	.00	7.0	.97	.00	.46	.00	.00	.00
22	.00	.19	.00	.00	.00	5.4	.83	.00	1.3	.00	.00	.00
23	.00	.16	.00	.00	.00	3.7	.86	.00	.41	.00	.00	.00
24	.00	.18	.00	.00	.00	4.3	1.3	.00	.17	.00	.00	.00
25	.00	.15	.00	.00	.00	2.7	.89	.00	.25	.00	.00	.00
26	.00	.16	.00	.00	.00	2.5	.81	.94	.27	.00	.00	.00
27	.00	.19	.00	.00	.00	1.7	.79	.19	.12	.00	.45	.00
28	.00	.03	.00	.00	.00	2.0	.76	.05	.04	.00	.34	.00
29	.00	.03	.00	.00	---	1.1	.76	.03	.00	.00	.04	.00
30	.00	.02	.43	.00	---	1.1	.61	.08	.00	.00	.00	.00
31	.00	---	.00	.00	---	1.5	---	.06	---	.00	.00	---
TOTAL	1.77	2.22	.47	.00	.00	66.52	31.66	4.63	6.39	.00	1.53	.00
MEAN	.06	.07	.01	.00	.00	2.15	1.06	.15	.21	.00	.05	.00
MAX	.81	.33	.43	.00	.00	13	1.5	.94	1.3	.00	.45	.00
MIN	.00	.00	.00	.00	.00	.00	.61	.00	.00	.00	.00	.00
AC-FT	3.	4.4	.9	.00	.00	132	63	9.2	13	.00	3.0	.00

CAL YR 1984	TOTAL	995.12	MEAN	2.72	MAX	125	MIN	.00	AC-FT	1970
WTR YR 1985	TOTAL	115.19	MEAN	.32	MAX	13	MIN	.00	AC-FT	228

## CHEYENNE RIVER BASIN

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## 06434500 INLET CANAL NEAR BELLE FOURCHE, SD

LOCATION.--Lat 44°42'14", long 103°49'23", in NE¼NW¼ sec.36, T.9 N., R.2 E., Butte County, Hydrologic Unit 10120202, on right bank 0.5 mi downstream from Crow Creek, 0.9 mi downstream from diversion dam on Belle Fourche River, and 2.5 mi northeast of Belle Fourche.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to current year. Monthly diversions from Inlet Canal between station and reservoir for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,985.22 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 10, 1946, nonrecording gage, and Dec. 10, 1946, to Nov. 26, 1949, water-stage recorder at site 0.8 mi upstream at same datum.

REMARKS.--Records good except those for winter period, Dec. 13 to Feb. 27, which are poor. Records show actual diversions to Belle Fourche Reservoir (see station 06435000), from Belle Fourche River and Crow Creek, except for 5,800 acre-ft which was diverted for irrigation from the canal between the station and reservoir.

COOPERATION.--Records of diversion from the canal provided by Bureau of Reclamation.

AVERAGE DISCHARGE.--40 years, 165 ft<sup>3</sup>/s (119,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,410 ft<sup>3</sup>/s May 16, 1982; no flow for some days in 1946-49, 1963, 1966, 1971-76, 1978-79, 1982-84.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	155	176	180	135	62	187	261	176	78	101	146	48
2	155	180	170	160	68	197	253	179	86	88	132	37
3	157	194	170	180	68	167	249	167	89	86	124	47
4	156	200	170	200	74	160	261	153	97	78	123	66
5	167	197	180	220	88	150	264	150	96	89	104	70
6	184	193	180	210	100	140	257	145	91	99	96	82
7	192	194	180	200	130	150	253	134	89	100	93	71
8	176	196	170	190	150	150	247	96	85	99	104	60
9	173	211	168	150	160	158	239	61	86	94	107	62
10	180	201	169	130	160	171	239	45	85	74	93	61
11	190	194	170	110	160	185	235	50	88	60	73	63
12	192	207	170	130	160	192	240	50	88	35	53	63
13	190	213	160	150	160	207	238	51	78	23	30	58
14	190	210	160	140	170	240	228	44	71	22	17	60
15	192	205	160	120	180	315	230	45	65	30	8.0	59
16	194	182	160	130	170	513	228	40	57	43	8.6	57
17	194	190	160	130	160	740	225	51	48	44	20	57
18	195	182	180	120	160	825	222	95	54	49	75	54
19	190	184	200	110	170	749	225	124	54	57	79	57
20	182	183	220	100	180	623	234	109	51	96	70	80
21	185	184	240	130	200	572	235	103	27	105	43	103
22	186	185	220	150	220	527	226	95	12	107	34	104
23	184	186	220	160	180	444	223	101	12	98	34	113
24	188	198	210	160	170	405	214	101	8.5	97	41	124
25	191	202	200	160	170	376	211	90	21	94	47	134
26	192	184	200	155	170	359	206	104	81	103	57	141
27	190	184	200	150	190	345	203	112	106	102	58	139
28	191	180	180	130	219	300	199	92	98	113	48	144
29	190	179	160	110	---	286	194	82	99	131	39	147
30	198	182	140	84	---	257	184	74	103	128	47	148
31	197	---	120	70	---	263	---	74	---	138	49	---
TOTAL	5696	5756	5567	4474	4249	10353	6923	2993	2103.5	2583	2052.6	2509
MEAN	184	192	180	144	152	334	231	96.5	70.1	83.3	66.2	83.6
MAX	198	213	240	220	220	825	264	179	106	138	146	148
MIN	155	176	120	70	62	140	184	40	8.5	22	8.0	37
AC-FT	1130	11420	11040	8870	8430	20540	13730	5940	4170	5120	4070	4980
CAL YR 1984	TOTAL	78941.43		MEAN	216	MAX	1270	MIN	.00	AC-FT	156600	
WTR YR 1985	TOTAL	55259.1		MEAN	151	MAX	825	MIN	8.0	AC-FT	109600	

## 06434500 INLET CANAL NEAR BELLE FOURCHE, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1968 to current year.

WATER TEMPERATURE: October 1968 to current year.

REMARKS.--Samples collected once daily by observer.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum observed daily, 3,100 microsiemens, Feb. 13, 1969; minimum daily, 335 microsiemens, Feb. 12, 1971.

WATER TEMPERATURE: Maximum observed daily, 29.0°C, July 1, 1971, July 30, 1984; minimum daily, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum observed daily, 2,000 microsiemens, June 25; minimum observed daily, 1,070 microsiemens, Nov. 8.

WATER TEMPERATURE: Maximum observed daily, 28.5°C, July 11; minimum observed daily, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE 'MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	
DATE	TIME												
OCT 1984													
12...	1230	192	1330	8.5	22.0	13.0	720	510	200	54	39	10	
NOV													
07...	1445	194	1230	8.3	12.0	6.0	760	599	220	50	23	6	
JAN 1985													
07...	1610	199	1200	8.2	-3.0	.0	710	487	210	46	15	4	
FEB													
11...	1500	150	1310	8.1	4.5	.0	740	517	220	47	18	5	
MAR													
11...	1300	187	1270	8.3	2.5	5.0	750	539	220	49	26	7	
APR													
02...	1645	256	1300	8.4	16.5	11.5	760	602	220	50	40	10	
MAY													
09...	0830	62	1670	--	17.5	16.0	880	739	240	67	71	15	
JUN													
06...	1030	89	1440	8.2	23.0	19.5	670	513	180	54	94	23	
JUL													
02...	1015	82	1440	--	26.5	21.5	570	405	150	48	110	29	
AUG													
06...	0915	100	1400	8.5	23.0	21.5	540	377	140	46	120	32	
SEP													
06...	0845	70	1510	8.4	18.0	16.5	770	598	210	60	78	18	
DATE		SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)
OCT 1984													
12...	.7	4.3	213	530	14	.40	9.0	--	980	1.3	.32	.120	
NOV													
07...	.4	3.1	157	560	4.6	.40	8.9	--	960	1.3	.28	.030	
JAN 1985													
07...	.3	2.6	228	480	4.4	.30	10	--	910	1.2	.56	.070	
FEB													
11...	.3	2.7	227	500	4.2	.30	11	--	940	1.3	.59	.040	
MAR													
11...	.4	4.8	213	500	5.3	.30	9.7	--	940	1.3	.40	.110	
APR													
02...	.7	4.3	154	590	5.0	.40	8.0	--	1000	1.4	.22	.100	
MAY													
09...	1	6.7	137	850	7.7	.50	3.9	--	1300	1.8	<.10	.020	
JUN													
06...	2	7.6	160	630	16	.50	6.0	--	1100	1.5	.22	.160	
JUL													
02...	2	8.7	168	670	23	.60	6.6	--	1100	1.5	<.10	.180	
AUG													
06...	2	10	163	580	25	.60	4.6	--	1000	1.4	<.10	.000	
SEP													
06...	1	6.7	175	700	15	.50	8.0	--	1200	1.6	.13	<.010	

## CHEYENNE RIVER BASIN

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06434500 INLET CANAL NEAR BELLE FOURCHE, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 1984											
12...	--	.070	.070	--	120	--	--	--	--	--	--
NOV											
07...	--	.020	.020	--	90	--	--	--	--	--	--
JAN 1985											
07...	--	.030	.030	--	70	--	--	--	--	--	--
FEB											
11...	--	.030	.040	--	70	--	--	--	--	--	--
MAR											
11...	--	.040	.040	--	80	--	--	--	--	--	--
APR											
02...	--	.020	.020	--	100	--	--	--	--	--	--
MAY											
09...	--	.010	<.010	--	190	--	--	--	--	--	--
JUN											
06...	.49	.010	.010	--	180	--	--	--	--	--	--
JUL											
02...	.55	.020	.010	--	190	--	--	--	--	--	--
AUG											
06...	--	.020	<.010	--	180	--	--	--	--	--	--
SEP											
06...	--	<.010	<.010	--	170	--	--	--	--	--	--

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
RANDOM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.0	3.0	---	---	.0	4.0	6.0	17.0	---	23.0	17.5	18.0
2	---	2.0	---	.0	---	---	---	---	---	24.0	24.5	18.5
3	11.0	---	.0	---	---	---	9.0	18.0	13.0	24.0	22.0	24.0
4	---	---	---	.0	.0	---	---	---	13.5	22.0	25.5	22.0
5	10.0	5.0	.0	---	---	---	7.0	---	14.5	23.5	24.0	19.0
6	---	5.0	---	---	.0	.0	---	11.0	19.5	22.0	25.0	19.0
7	---	6.0	.0	.0	---	---	---	---	22.0	22.5	25.5	---
8	10.0	4.0	---	---	.0	.0	3.0	19.0	21.0	26.5	23.0	---
9	---	---	---	.0	---	---	---	16.0	19.5	24.5	---	---
10	16.0	---	2.0	---	---	---	10.0	22.0	15.5	26.0	---	---
11	17.0	---	---	.0	.0	4.0	---	14.0	14.0	28.5	---	---
12	21.0	---	.0	---	---	---	12.0	17.0	13.5	26.0	20.0	---
13	---	4.0	---	---	.0	3.0	---	14.0	15.5	24.0	18.0	17.0
14	---	---	.0	.0	.0	---	---	13.0	18.5	22.0	18.5	---
15	14.0	---	---	---	.0	3.0	7.0	15.0	21.5	23.0	22.0	---
16	---	2.0	---	.0	---	---	---	17.0	22.0	20.0	20.0	17.0
17	5.0	---	.0	---	---	---	12.0	15.0	17.0	24.5	19.0	---
18	---	---	---	.0	---	3.0	---	17.0	17.5	21.0	14.0	19.0
19	7.0	1.0	.0	---	.0	4.0	7.0	17.0	19.0	22.0	20.5	---
20	---	---	---	---	---	5.0	---	21.0	19.5	20.5	18.0	14.0
21	---	3.0	.0	.0	.0	---	---	22.0	16.5	22.0	21.0	---
22	6.0	---	---	---	.0	3.0	12.0	21.5	16.0	22.0	23.0	---
23	---	---	---	.0	---	---	---	20.0	18.0	22.0	18.0	10.0
24	5.0	---	.0	---	---	---	13.0	22.5	27.0	25.0	24.5	---
25	---	---	---	.0	.0	5.0	---	20.0	18.0	19.0	19.5	7.0
26	8.0	1.0	.0	---	.0	---	10.0	---	15.5	24.0	24.0	---
27	---	---	---	---	.0	4.0	---	18.5	19.5	23.5	21.0	9.0
28	---	.0	.0	.0	---	---	---	22.5	22.0	21.0	24.5	---
29	5.0	---	---	---	---	2.0	17.0	23.0	17.0	22.0	24.5	---
30	---	3.0	---	.0	---	---	---	17.0	23.0	17.0	23.0	4.0
31	4.0	---	---	---	---	---	---	17.0	---	15.5	20.0	---



## CHEYENNE RIVER BASIN

06434500 INLET CANAL NEAR BELLE FOURCHE, SD--Continued

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25° CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
RANDOM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1290	---	---	---	1650	1310	1270	1370	---	1440	1360	1630
2	---	1250	---	1340	---	---	---	---	---	1420	1330	1680
3	1320	---	1340	---	---	---	1290	1380	1440	1450	1340	1640
4	---	---	---	1340	1530	---	---	---	1440	1440	1360	1640
5	1320	1340	1420	---	---	---	1310	---	1440	1510	1380	1570
6	---	1270	---	---	1400	1270	---	1420	1440	1510	1400	1550
7	---	1280	1250	1350	---	---	---	---	1460	1500	1430	---
8	1340	1070	---	---	1380	1220	1330	1480	1480	1490	1440	---
9	---	---	---	1290	---	---	---	1630	1500	1480	---	---
10	1340	---	1310	---	---	---	1280	1870	1500	1500	---	---
11	1370	---	---	1370	1340	1290	---	1850	1480	1530	---	---
12	1350	---	1330	---	---	---	1310	1790	1500	1550	1530	---
13	---	1290	---	---	1340	1370	---	1820	1430	1570	1560	1510
14	---	---	1320	1630	1430	---	---	1890	1490	1550	1630	---
15	1380	---	---	---	890	1300	1310	1920	1500	1540	1660	---
16	---	1220	---	1310	---	---	---	1970	1570	1460	1680	1510
17	1360	---	1440	---	---	---	1310	1980	1590	1510	1700	---
18	---	---	---	1310	---	920	---	1910	1510	1500	1560	1500
19	1330	1230	1340	---	1240	940	1290	1880	1550	1490	1560	---
20	---	---	---	---	---	950	---	1420	1540	1430	1520	1520
21	---	1250	1380	1500	890	---	---	1420	1720	1420	1680	---
22	1340	---	---	---	1150	1090	1290	1370	1800	1420	1650	---
23	---	---	---	1440	---	---	---	1380	1930	1400	1660	1440
24	1340	---	1040	---	---	---	1290	1380	1890	1410	1630	---
25	---	---	---	1340	1310	1080	---	1380	2000	1410	1620	1330
26	1330	1260	1330	---	1260	---	1300	---	1880	1420	1580	---
27	---	---	---	---	1260	1200	---	1360	1850	1420	1600	1340
28	---	1230	1400	1350	---	---	---	1360	1620	1420	1590	---
29	1300	---	---	---	---	1270	1300	1390	1530	1420	1590	---
30	---	1310	---	1290	---	---	---	1420	1500	1400	1600	1330
31	1340	---	1290	---	---	---	---	1440	---	1400	1610	---

## CHEYENNE RIVER BASIN

89

06435000 BELLE FOURCHE RESERVOIR NEAR BELLE FOURCHE, SD

LOCATION.--Lat 44°44'12", long 103°40'27", in SW¼SE¼ sec.18, T.9 N., R.4 E., Butte County, Hydrologic Unit 10120202, at dam on Owl Creek, 9.8 mi northeast of Belle Fourche.

PERIOD OF RECORD.--January 1912 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929, adjustment of 1912. Prior to June 6, 1967, nonrecording gage at present site and datum.

REMARKS.--Offstream reservoir formed by earthfill dam. Storage began in May 1910; dam completed in April 1911. Conservation capacity, 185,170 acre-ft (1949 survey), between elevations 2,927.0 ft (lowest outlet) and 2,975.0 ft (crest of spillway weir). Dead storage below elevation 2,927.0 ft, 6,800 acre-ft. Figures given herein represent contents above elevation 2,927.0 ft. Water diverted from Belle Fourche River through Inlet Canal (see station 06434500) is stored in Belle Fourche Reservoir for irrigation.

COOPERATION.--Records of elevation and contents provided by Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 197,400 acre-ft Apr. 30, 1919, May 20, 1920 (elevation, 2,974.9 ft); minimum observed, -3,000 acre-ft Sept. 30, 1936, water was lowered below dead storage level of 2,927.0 ft by opening holes in crib walls.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 175,175 acre-ft May 1 (elevation, 2,973.25 ft); minimum, 13,508 acre-ft Sept. 9 (elevation, 2,938.22 ft).

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	2,958.38	68,180	-
Oct. 31 . . . . .	2,961.34	85,400	+17,220
Nov. 30 . . . . .	2,963.54	97,900	+12,500
Dec. 31 . . . . .	2,905.26	108,200	+10,300
CAL YR 1984 . . . . .	-	-	+12,740
Jan. 31 . . . . .	2,966.90	118,800	+10,600
Feb. 28 . . . . .	2,968.31	128,300	+9,500
Mar. 31 . . . . .	2,972.02	155,100	+26,800
Apr. 30 . . . . .	2,973.75	168,300	+13,200
May 31 . . . . .	2,970.43	143,300	-25,000
June 30 . . . . .	2,967.24	121,100	-22,200
July 31 . . . . .	2,956.79	60,900	-60,200
Aug. 31 . . . . .	2,944.08	18,100	-42,800
Sept. 30 . . . . .	2,940.69	11,200	-6,900
WTR YR 1985 . . . . .	-	-	-56,980

## CHEYENNE RIVER BASIN

06436000 BELLE FOURCHE RIVER NEAR FRUITDALE, SD

LOCATION.--Lat 44°41'27", long 103°44'14", in NW¼NE¼ sec.3, T.8 N., R.3 E., Butte County, Hydrologic Unit 10120202, on left bank near downstream end of bridge on U.S. Highway 212, 2.5 mi northwest of Fruitdale, and 8.8 mi downstream from point of diversion to Belle Fourche Reservoir.

DRAINAGE AREA.--4,540 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for October 1945, published in WSP 1309.

GAGE.--Water-stage recorder. Elevation of gage is 2,925 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Apr. 9, 1947, non-recording gage and Apr. 10, 1947, to Oct. 14, 1948, water-stage recorder, at site 100 ft upstream at same datum. Oct. 15, 1948, to Dec. 30, 1958, water-stage recorder and Dec. 31, 1958, to Sept. 23, 1959, nonrecording gage at present site and datum.

REMARKS.--Records fair except those for winter period, Dec. 1 to Mar. 23, which are poor. Flow regulated by Keyhole Dam since Feb. 12, 1952, usable capacity, 191,600 acre-ft, 180 mi upstream. At a point 8.8 mi above station, water is diverted to Belle Fourche Reservoir (see station 06435000) through Inlet Canal (see station 06434500), with other smaller diversions from the main stem and tributaries for irrigation. Total diversions for irrigation of about 60,000 acres upstream from station. Several observations of water quality were made during the year.

AVERAGE DISCHARGE.--40 years, 86.3 ft<sup>3</sup>/s (62,520 acre-ft/yr); median of yearly mean discharges, 54 ft<sup>3</sup>/s (39,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,700 ft<sup>3</sup>/s May 20, 1982 (gage height, 14.32 ft); no flow at times in 1945, 1948, 1959-62, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23 ft<sup>3</sup>/s at 0645 hours, Aug. 6 (gage height, 3.29 ft); minimum daily discharge, 2.0 ft<sup>3</sup>/s Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	4.9	4.8	2.9	2.3	3.1	4.3	3.9	4.1	7.7	9.7	7.8
2	5.3	4.9	4.5	3.1	2.5	2.9	4.3	3.4	4.1	9.6	9.6	7.3
3	5.3	4.9	4.0	3.3	2.5	2.7	4.4	2.9	4.3	9.0	8.8	7.6
4	5.3	4.8	3.6	3.5	2.5	2.6	4.4	2.7	4.4	7.0	9.0	7.7
5	5.3	4.9	3.7	3.6	2.5	2.5	4.4	2.6	4.6	8.3	9.3	8.3
6	5.3	4.9	3.7	3.5	2.6	2.7	4.0	2.5	4.6	8.9	11	7.9
7	5.3	4.9	3.6	3.3	2.7	2.9	3.7	2.5	4.9	11	8.7	8.1
8	5.3	4.9	3.6	3.0	3.0	3.0	3.8	2.3	5.2	9.9	9.1	7.9
9	5.4	6.0	3.6	2.8	2.8	3.2	3.8	2.2	5.2	11	9.4	7.1
10	4.7	5.5	3.5	2.7	2.6	3.1	4.2	2.5	5.3	12	9.1	6.2
11	5.1	5.0	3.2	2.5	2.6	2.9	4.4	2.7	5.3	13	9.1	6.2
12	5.3	5.0	3.0	3.0	2.7	2.9	4.3	2.8	5.3	12	9.0	5.9
13	5.1	5.1	2.7	3.6	2.8	3.0	4.4	3.1	5.5	11	8.9	5.4
14	5.3	5.3	3.0	3.7	2.9	3.0	4.3	3.4	5.7	8.0	8.0	5.3
15	5.3	5.2	3.3	3.7	2.9	3.1	4.2	3.6	5.8	8.7	8.8	5.2
16	5.3	5.1	3.0	3.7	3.0	3.2	4.2	3.4	6.0	12	8.9	5.5
17	5.3	5.1	2.7	3.4	3.0	3.3	4.1	3.3	6.0	12	8.4	5.3
18	5.1	5.0	2.6	3.2	3.1	3.4	4.1	3.0	6.2	9.6	7.8	5.9
19	5.1	4.9	2.7	3.0	3.2	3.5	4.1	3.0	6.3	10	6.9	5.2
20	5.1	4.7	2.9	2.7	3.1	3.7	4.3	2.8	6.5	11	6.8	5.3
21	5.2	4.5	3.2	2.8	3.1	3.8	4.5	3.0	6.7	12	8.6	5.4
22	5.2	4.5	3.2	3.1	3.1	4.0	4.1	3.1	6.9	15	8.2	5.3
23	5.1	4.7	2.7	3.4	3.0	4.3	3.9	3.1	6.9	17	7.4	5.3
24	5.1	4.8	2.6	3.5	3.0	4.4	3.5	3.2	7.0	15	6.9	5.3
25	5.1	5.0	3.3	3.5	2.9	4.6	3.5	3.2	7.2	14	6.8	5.5
26	5.1	5.0	3.6	3.4	2.8	4.4	3.7	3.6	7.3	14	6.7	5.4
27	5.0	5.0	3.6	3.2	3.1	4.1	3.8	3.6	7.5	13	6.7	5.5
28	5.0	5.1	3.2	3.0	3.2	3.7	3.8	3.7	7.5	12	6.2	5.4
29	5.1	4.9	3.1	2.9	---	3.4	3.9	3.7	7.0	10	6.0	5.4
30	5.1	4.9	2.9	2.6	---	3.5	4.3	3.8	7.7	9.5	6.8	5.4
31	5.1	---	2.9	2.0	---	3.7	---	4.0	---	11	7.8	---
TOTAL	160.6	149.4	102.0	97.6	79.5	104.6	122.7	96.6	177.0	344.2	254.4	185.0
MEAN	5.18	4.98	3.29	3.15	2.84	3.37	4.09	3.12	5.90	11.1	8.21	6.17
MAX	5.4	6.0	4.8	3.7	3.2	4.6	4.5	4.0	7.7	17	11	8.3
MIN	4.7	4.5	2.6	2.0	2.3	2.5	3.5	2.2	4.1	7.0	6.0	5.2
AC-FT	31	296	202	194	158	207	243	192	351	683	505	367
CAL YR 1984	TOTAL	40536.7		MEAN	111	MAX	3440	MIN	2.6	AC-FT	80400	
WTR YR 1985	TOTAL	1873.6		MEAN	5.13	MAX	17	MIN	2.0	AC-FT	3720	

## CHEYENNE RIVER BASIN

91

06436170 WHITEWOOD CREEK AT DEADWOOD, SD

LOCATION.--Lat 44°22'48", long 103°43'25", in NW¼NE¼SW¼ sec.23, T.5 N., R.3 E., Lawrence County, Hydrologic Unit 10120202, on left bank 1,000 ft downstream from box culvert where stream leaves city and at the junction of lower Main Street and truck route of highways U.S. 85 and A.H. 14 in Deadwood.

DRAINAGE AREA.--40.6 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 4,500 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Flow regulated by Homestake Mining Co. 3.5 mi upstream. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,660 ft<sup>3</sup>/s May 15, 1982 (gage height, 5.54 ft); minimum daily, 3.5 ft<sup>3</sup>/s Jan. 10, 1982.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 81 ft<sup>3</sup>/s at 2000 hours, Sept. 2 (gage height, 3.47 ft); maximum gage height, 3.92 ft Feb. 4 (backwater from ice); minimum daily discharge, 8.6 ft<sup>3</sup>/s Feb. 7, Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	11	12	9.0	9.0	9.6	16	15	13	11	9.6	13
2	13	12	11	9.5	9.0	9.5	17	14	13	11	9.7	15
3	14	12	12	10	8.8	9.0	20	14	13	11	10	10
4	16	11	12	9.8	9.0	9.9	25	14	12	11	10	9.8
5	16	11	12	10	9.0	11	19	14	13	11	9.9	9.9
6	18	11	13	10	9.0	10	17	14	14	11	11	8.6
7	16	12	13	9.8	8.6	10	15	13	14	10	11	8.8
8	16	11	13	9.7	9.0	10	15	14	16	9.9	12	10
9	15	12	13	10	9.2	11	16	13	15	11	12	10
10	15	11	12	10	9.4	11	19	13	18	12	12	9.7
11	15	11	13	10	9.3	11	21	14	16	12	12	9.6
12	15	11	12	10	9.4	10	28	13	16	12	12	11
13	15	12	13	11	9.5	11	31	12	15	12	12	9.5
14	15	13	12	11	9.5	11	30	13	14	12	12	9.9
15	15	12	12	11	9.9	11	29	13	13	12	11	10
16	14	11	11	11	9.8	12	30	13	14	11	12	10
17	14	12	11	11	9.8	13	26	12	14	10	11	11
18	15	12	11	11	9.6	14	23	16	14	9.1	11	10
19	13	11	11	11	9.4	13	25	16	17	9.6	12	10
20	12	11	11	10	9.6	14	27	16	16	10	11	10
21	12	11	11	10	9.9	15	20	16	17	9.3	11	11
22	12	12	11	9.7	10	15	19	17	14	9.1	12	11
23	12	11	11	10	9.5	13	18	18	13	9.1	12	11
24	12	12	10	10	10	14	17	17	12	9.6	12	11
25	12	11	10	10	9.6	16	17	17	11	9.2	12	14
26	11	10	10	10	9.3	16	17	24	14	9.1	13	12
27	11	12	11	10	9.4	15	15	17	12	9.5	14	12
28	11	12	10	10	9.8	14	16	14	11	10	14	11
29	11	13	9.9	10	---	13	15	13	11	10	15	11
30	11	12	9.0	10	---	13	14	14	12	10	14	11
31	11	---	9.0	9.5	---	14	---	13	---	10	13	---
TOTAL	421	346	351.9	314.0	263.3	379.0	617	456	417	323.5	365.2	320.8
MEAN	13.6	11.5	11.4	10.1	9.40	12.2	20.6	14.7	13.9	10.4	11.8	10.7
MAX	18	13	13	11	10	16	31	24	18	12	15	15
MIN	11	10	9.0	9.0	8.6	9.0	14	12	11	9.1	9.6	8.6
AC-FT	83	686	698	623	522	752	1220	904	827	642	724	636
CAL YR 1984	TOTAL	15274.9		MEAN	41.7	MAX	523	MIN	9.0	AC-FT	30300	
WTR YR 1985	TOTAL	4574.7		MEAN	12.5	MAX	31	MIN	8.6	AC-FT	9070	



## CHEYENNE RIVER BASIN

06436180 WHITEWOOD CREEK ABOVE WHITEWOOD, SD

LOCATION.--Lat 44°26'32", long 103°37'44", in SE1/4SE1/4NE1/4 sec.33, T.6 N., R.4 E., Lawrence County, Hydrologic Unit 10120202, on left bank 90 ft downstream from Crook Mountain Road, 1.1 mi south of Whitewood.

DRAINAGE AREA.--56.3 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,680 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Nov. 26 to Feb. 20, which are poor. Flow affected by transbasin diversions for industrial and municipal water supplies. Several observations of water quality were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 684 ft<sup>3</sup>/s May 7, 1983 (gage height, 4.60 ft); minimum daily discharge, 7.5 ft<sup>3</sup>/s Jan. 30, 31, 1985.

EXTREMES FOR WATER YEAR 1983.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 27	1715	111	2.63	Aug. 4	1630	174	3.23
May 7	0215	*684	*4.60	Aug. 5	1845	174	3.23

EXTREMES FOR WATER YEAR 1984.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 2	--	ice jam	*4.55	June 14	0430	*422	3.99
May 10	0315	302	3.70	June 15	1530	391	3.91
June 1	0400	122	3.02	Aug. 2	1545	192	3.41
June 10	0015	355	3.82				

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 13	--	ice jam	*4.44	Apr. 3	2215	*43	2.46

Minimum daily discharge, 7.5 ft<sup>3</sup>/s Jan. 30, 31.

## CHEYENNE RIVER BASIN

93

06436180 WHITEWOOD CREEK ABOVE WHITEWOOD, SD--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	12	10	8.0	13	19	17	13	12	9.6	10
2	15	14	11	11	8.5	12	21	16	13	11	9.4	11
3	15	14	10	15	9.0	12	26	16	15	11	9.3	12
4	18	14	10	18	9.5	12	28	16	13	11	9.6	10
5	19	14	11	20	10	12	22	16	14	10	9.0	9.7
6	22	13	13	20	10	13	20	15	14	10	9.5	9.6
7	18	15	16	18	11	14	19	15	13	10	9.8	9.2
8	19	14	17	17	11	18	19	16	13	9.1	9.2	10
9	17	14	18	16	12	16	20	15	12	9.2	9.3	11
10	17	14	18	15	12	15	21	15	17	10	9.1	11
11	18	15	17	14	12	15	23	17	16	10	8.9	11
12	17	14	16	13	13	14	29	16	14	10	8.9	12
13	17	14	14	14	13	14	28	14	13	11	8.9	10
14	18	14	15	16	13	15	25	14	13	11	9.2	11
15	18	14	16	17	13	16	25	14	13	11	9.1	10
16	18	14	15	16	13	17	25	14	12	11	9.1	11
17	18	13	11	13	14	18	24	13	12	11	8.9	10
18	19	13	10	10	14	18	23	15	12	11	8.8	11
19	17	14	10	8.0	14	18	24	15	15	11	10	11
20	16	13	12	8.0	13	18	27	13	15	13	9.6	11
21	16	13	14	8.5	13	19	23	13	16	11	9.4	11
22	15	13	12	9.0	13	18	23	14	14	11	9.5	12
23	15	13	10	11	12	16	22	15	12	10	9.2	12
24	15	13	9.0	13	13	16	20	14	12	11	9.3	12
25	15	13	9.0	14	13	19	20	13	12	11	9.0	18
26	15	13	11	13	14	19	19	20	15	9.9	9.3	14
27	15	13	14	12	12	18	18	17	13	9.6	10	14
28	15	13	14	10	13	18	18	15	11	9.6	10	14
29	14	14	11	9.0	---	17	18	14	11	9.8	11	13
30	14	13	10	7.5	---	17	17	15	13	11	11	12
31	14	---	10	7.5	---	18	---	14	---	10	9.9	---
TOTAL	513	409	396.0	403.5	336.0	495	666	466	401	327.2	292.8	343.5
MEAN	16.5	13.6	12.8	13.0	12.0	16.0	22.2	15.0	13.4	10.6	9.45	11.4
MAX	22	15	18	20	14	19	29	20	17	13	11	18
MIN	14	13	9.0	7.5	8.0	12	17	13	11	9.1	8.8	9.2
AC-FT	102	811	785	800	666	982	1320	924	795	649	581	681
CAL YR 1984	TOTAL	12972.0		MEAN	35.4	MAX	266	MIN	9.0	AC-FT	25730	
WTR YR 1985	TOTAL	5049.0		MEAN	13.8	MAX	29	MIN	7.5	AC-FT	10010	

## CHEYENNE RIVER BASIN

06436190 WHITEWOOD CREEK NEAR WHITEWOOD, SD

LOCATION.--Lat 44°32'30", long 103°34'16", in SE¼NW¼SE¼NE¼ sec.25, T.7 N., R.4 E., Lawrence County, Hydrologic Unit 10120202, on right bank 30 ft downstream from county highway bridge, 6.9 mi northeast of Whitewood.

DRAINAGE AREA.--77.4 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,175 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Small diversions above station for irrigation of 256 acres. Several observations of water quality were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,050 ft<sup>3</sup>/s May 20, 1982 (gage height, 4.52 ft); minimum daily, 2.9 ft<sup>3</sup>/s July 12, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 29	--	a	*1.56	Mar. 15	1815	*39	1.19

a Backwater from ice.

Minimum daily discharge, 2.9 ft<sup>3</sup>/s July 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	17	15	14	8.2	16	18	17	13	7.2	5.4	4.7
2	19	19	12	15	7.6	15	21	18	14	7.2	4.3	5.4
3	19	18	11	16	8.2	15	24	19	15	6.5	4.2	7.2
4	21	18	12	16	10	16	29	20	14	5.9	5.1	5.6
5	23	18	11	16	10	18	24	21	13	5.7	4.5	4.3
6	27	18	17	16	12	17	22	22	12	4.8	5.6	4.0
7	22	18	16	16	13	17	20	24	10	4.2	5.4	4.5
8	23	17	16	15	15	17	18	25	8.6	3.6	5.8	5.1
9	21	22	16	16	16	18	20	23	9.3	3.1	5.3	6.4
10	20	18	16	18	16	18	20	24	14	3.2	5.7	7.0
11	20	18	16	17	17	17	22	23	14	3.1	4.6	7.3
12	20	19	14	17	17	16	26	23	12	2.9	4.8	7.8
13	19	19	13	18	17	15	28	19	11	3.2	4.9	7.1
14	20	19	15	18	17	16	25	19	9.8	3.7	5.1	6.9
15	21	19	16	18	18	24	24	18	9.3	3.8	5.5	6.6
16	21	18	17	17	18	21	24	17	8.4	3.6	4.4	6.2
17	20	20	17	16	17	21	24	17	9.0	3.7	4.5	6.2
18	22	19	16	16	17	21	22	17	9.5	3.6	3.9	7.0
19	21	19	15	15	17	20	22	19	13	3.7	4.0	8.0
20	19	18	15	14	17	19	26	16	13	4.7	5.5	8.0
21	18	19	15	15	16	20	23	16	14	3.7	4.2	8.4
22	19	17	15	16	16	20	22	16	12	3.3	4.4	9.5
23	20	17	15	17	16	18	21	19	8.9	3.4	3.8	11
24	19	18	15	18	16	17	20	16	7.8	3.6	4.5	11
25	19	18	14	15	16	19	20	14	8.1	4.1	4.2	14
26	19	16	14	15	15	20	19	20	11	3.7	3.6	13
27	18	8.9	15	15	14	19	19	19	12	3.6	4.6	12
28	19	12	15	14	15	18	18	16	9.1	3.6	4.5	13
29	19	17	15	13	---	17	18	15	8.2	3.9	4.6	12
30	18	17	14	11	---	17	17	14	9.3	5.3	5.2	12
31	19	---	14	10	---	19	---	15	---	5.7	4.7	---
TOTAL	624	530.9	457	483	412.0	561	656	581	332.3	131.3	146.8	241.2
MEAN	20.1	17.7	14.7	15.6	14.7	18.1	21.9	18.7	11.1	4.24	4.74	8.04
MAX	27	22	17	18	18	24	29	25	15	7.2	5.8	14
MIN	18	8.9	11	10	7.6	15	17	14	7.8	2.9	3.6	4.0
AC-FT	124	1050	906	958	817	1110	1300	1150	659	260	291	478
CAL YR 1984	TOTAL	13421.9		MEAN	36.7	MAX	244	MIN	8.9	AC-FT	26620	
WTR YR 1985	TOTAL	5156.5		MEAN	14.1	MAX	29	MIN	2.9	AC-FT	10230	

## CHEYENNE RIVER BASIN

95

06436198 WHITEWOOD CREEK ABOVE VALE, SD

LOCATION.--Lat 44°37'04", long 103°28'52", in SE¼NW¼NE¼NW¼ sec.35, T.8 N., R.5 E., Butte County, Hydrologic Unit 10120202, on left bank at point where South Canal crosses creek, 3.2 mi above mouth, and 3.7 mi west of Vale.

DRAINAGE AREA.--102 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,840 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Nov. 21 to Mar. 16, which are poor. Diversions upstream from station for irrigation of about 800 acres. Several observations of water quality were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,070 ft<sup>3</sup>/s June 10, 1984 (gage height, 2.60 ft); no flow July 21, 22 and Aug. 19, 1985.

EXTREMES FOR PERIOD November 1982 to Sept. 30, 1983.--Peak discharges greater than base discharge of 170 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 16	2115	371	1.89	Apr. 25	1145	279	1.73
Apr. 17	1745	338	1.83	May 7	0515	*502	*2.10

EXTREMES FOR WATER YEAR 1984.--Peak discharges greater than base discharge of 170 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 4	--	a	*2.67	May 10	0845	256	1.64
Apr. 28	1615	529	2.13	June 10	0245	*1,070	2.60
May 3	2130	371	1.87	June 14	0900	382	1.79
May 5	0015	289	1.71	June 15	0630	452	1.92

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 170 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 10	--	a	*3.20	May 26	2100	*81	1.37

a Backwater from ice.

No flow July 21, 22, Aug. 19.



## CHEYENNE RIVER BASIN

06436198 WHITEWOOD CREEK ABOVE VALE, SD--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	16	17	6.0	5.2	17	20	16	11	6.0	1.3	2.9
2	13	17	15	7.0	5.4	15	19	15	7.2	3.4	1.2	1.1
3	14	18	14	8.0	5.6	14	14	15	19	3.0	1.0	1.9
4	15	15	14	9.5	5.8	13	19	15	20	1.9	1.4	2.3
5	18	15	14	11	6.2	12	15	14	14	4.6	1.3	1.2
6	21	15	16	11	7.0	12	14	14	13	3.8	2.3	.72
7	18	16	17	10	7.5	13	9.7	12	12	2.6	2.5	1.2
8	17	16	17	10	9.5	14	8.4	11	6.6	1.3	3.1	1.6
9	16	17	16	9.5	9.0	15	13	11	7.7	.27	2.2	3.2
10	16	18	15	8.5	8.0	17	15	12	12	1.9	2.8	2.3
11	15	19	11	8.0	11	21	20	14	15	1.1	2.3	2.8
12	16	19	8.6	9.5	13	25	24	17	10	.49	2.0	3.2
13	16	19	8.0	11	14	34	29	12	9.3	.51	2.0	2.5
14	16	20	9.0	12	15	44	28	14	7.9	2.7	2.6	2.2
15	17	19	10	12	16	40	26	15	8.1	3.6	1.6	3.4
16	19	20	8.0	12	15	30	27	10	6.2	2.9	.81	3.4
17	19	17	8.0	11	15	24	26	11	4.0	1.4	.33	3.1
18	20	17	8.4	10	15	25	24	9.5	4.9	1.1	.08	3.0
19	21	17	9.0	9.5	15	24	24	13	8.1	2.1	.00	3.3
20	18	16	9.4	9.0	16	22	28	12	9.8	3.1	.89	6.3
21	18	17	9.6	9.8	15	22	27	8.4	11	.00	1.8	5.5
22	18	18	9.0	11	15	22	27	11	11	.00	2.7	5.7
23	17	19	8.0	12	15	19	25	16	5.8	1.4	2.9	6.4
24	16	18	6.0	15	15	19	23	12	3.0	2.0	.93	8.5
25	17	16	6.5	14	14	20	25	8.6	1.7	2.7	.03	11
26	15	12	7.5	13	14	21	22	28	4.2	2.4	.31	12
27	14	10	9.0	11	16	21	21	55	5.8	1.7	2.3	9.0
28	16	16	7.6	8.0	17	22	20	34	2.3	1.5	3.1	11
29	14	20	6.6	7.0	---	20	19	23	3.4	1.4	3.0	11
30	14	19	6.0	6.0	---	19	17	12	5.1	2.7	3.3	11
31	15	---	5.5	5.0	---	20	---	22	---	2.0	2.8	---
TOTAL	512	511	325.7	306.3	335.2	656	629.1	492.5	259.1	65.57	54.88	142.72
MEAN	16.5	17.0	10.5	9.88	12.0	21.2	21.0	15.9	8.64	2.12	1.77	4.76
MAX	21	20	17	15	17	44	29	55	20	6.0	3.3	12
MIN	13	10	5.5	5.0	5.2	12	8.4	8.4	1.7	.00	.00	.72
AC-FT	102	1010	646	608	665	1300	1250	977	514	130	109	283
CAL YR 1984	TOTAL	16211.2		MEAN	44.3	MAX	604	MIN	5.5	AC-FT	32150	
WTR YR 1985	TOTAL	4290.07		MEAN	11.8	MAX	55	MIN	.00	AC-FT	8510	

## CHEYENNE RIVER BASIN

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06436760 HORSE CREEK ABOVE VALE, SD

LOCATION.--Lat 44°39'08", long 103°21'59", in SE¼NE¼SE¼ sec.15, T.8 N., R.6 E., Butte County, Hydrologic Unit 10120202, on left bank 2.6 mi upstream from Dry Creek, 5.5 mi upstream from mouth, 3.0 mi northeast of Vale, and 4.5 mi southeast of Newell.

DRAINAGE AREA.--462 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1980 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,710 ft above National Geodetic Vertical Datum of 1929, from topographic map. April 1962 to September 1980, water-stage recorder, at site 2.7 mi downstream, at different datum.

REMARKS.--Records good except those for winter period and/or no gage-height record, Jan. 30 to Mar. 21 and May 9 to June 11, which are poor. Natural flow of stream affected by diversions for irrigation upstream from station and by return flow from Belle Fourche Irrigation Project. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,700 ft<sup>3</sup>/s May 21, 1982 (gage height, 24.80 ft); minimum daily, 0.15 ft<sup>3</sup>/s Apr. 26, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 20	unknown	*1,350	*9.80	No other peak greater than base discharge.			

Minimum daily discharge, 0.15 ft<sup>3</sup>/s Apr. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	3.4	2.8	2.4	2.1	5.8	23	1.3	40	66	83	83
2	17	3.4	2.7	2.4	2.3	5.6	21	1.5	40	68	69	82
3	16	3.6	2.8	2.6	2.3	5.4	18	1.7	40	65	59	95
4	13	3.8	2.7	2.8	2.4	5.0	16	1.7	40	64	45	93
5	12	3.5	2.8	3.1	2.5	5.0	15	1.1	35	68	42	77
6	13	3.4	3.1	3.3	2.8	5.4	12	.98	35	77	40	71
7	15	3.5	3.3	3.1	3.0	5.6	11	.72	35	86	36	73
8	14	3.4	3.4	2.9	3.3	6.0	10	.74	32	89	41	75
9	9.0	6.3	3.4	2.8	3.8	6.4	8.9	1.0	32	84	40	74
10	6.2	5.8	3.4	2.6	4.5	6.4	8.7	5.0	32	75	44	50
11	6.1	5.2	3.3	2.5	4.8	6.4	7.7	10	32	74	51	30
12	5.8	4.6	3.2	2.2	5.0	6.8	6.7	15	29	87	51	24
13	5.3	4.4	2.5	2.4	5.2	6.8	5.9	20	24	101	51	21
14	4.9	6.8	2.4	2.5	5.2	7.0	5.0	20	25	99	54	16
15	4.8	5.8	2.4	2.7	5.4	8.0	4.5	20	26	105	63	14
16	4.7	5.8	2.2	2.8	5.4	10	3.7	20	28	107	68	11
17	4.5	5.4	2.2	3.0	5.4	50	3.3	20	27	98	73	8.9
18	4.5	4.3	2.2	3.4	5.4	200	3.6	20	23	99	72	7.4
19	4.5	3.5	2.2	2.9	5.4	400	1.9	25	22	88	69	6.6
20	4.4	3.0	2.3	3.0	5.4	1100	.72	30	23	73	74	6.3
21	4.4	3.1	2.5	3.3	5.2	800	.67	30	29	66	80	6.1
22	4.3	3.0	2.6	3.8	5.1	394	.92	30	36	62	83	5.5
23	4.1	1.9	2.6	4.2	5.0	214	1.3	35	35	65	76	4.6
24	3.9	3.6	2.6	3.7	4.9	131	.67	35	34	67	85	4.7
25	4.0	3.5	2.7	3.5	4.9	84	.60	35	37	68	94	5.4
26	3.9	3.1	3.0	3.3	5.2	62	.15	40	38	67	83	5.8
27	3.8	3.4	3.4	2.8	5.6	51	1.7	45	51	62	80	5.6
28	3.4	2.9	3.0	2.3	6.0	44	1.9	50	54	56	82	5.0
29	3.4	2.9	3.0	2.1	---	36	1.9	45	59	58	89	4.7
30	3.4	3.0	2.8	2.1	---	29	1.5	45	68	72	93	5.1
31	3.4	---	2.4	2.1	---	25	---	40	---	89	87	---
TOTAL	226.7	119.3	85.9	88.6	123.5	3721.6	197.93	645.74	1061	2405	2057	970.7
MEAN	7.31	3.98	2.77	2.86	4.41	120	6.60	20.8	35.4	77.6	66.4	32.4
MAX	20	6.8	3.4	4.2	6.0	1100	23	50	68	107	94	95
MIN	3.4	1.9	2.2	2.1	2.1	5.0	.15	.72	22	56	36	4.6
AC-FT	45	237	170	176	245	7380	393	1280	2100	4770	4080	1930
CAL YR 1984	TOTAL	22583.9		MEAN	61.7	MAX	1570	MIN	1.8	AC-FT	44800	
WTR YR 1985	TOTAL	11702.97		MEAN	32.1	MAX	1100	MIN	.15	AC-FT	23210	

## CHEYENNE RIVER BASIN

06437000 BELLE FOURCHE RIVER NEAR STURGIS, SD

LOCATION.--Lat 44°30'47", long 103°08'11", in SE¼NW¼ sec.3, T.6 N., R.8 E., Meade County, Hydrologic Unit 10120202, on right bank near upstream end of bridge on State Highway 34, 0.5 mi upstream from Bear Butte Creek, and 20 mi northeast of Sturgis.

DRAINAGE AREA.--5,870 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for some periods, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,526.13 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 31, 1946, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period and/or no gage-height record, Dec. 1 to Mar. 19, which are poor. Flow regulated by Keyhole Dam, usable capacity, 191,600 acre-ft, 246 mi upstream since February 1952. At a point 75 mi upstream, water is diverted to Belle Fourche Reservoir (see station 06435000), through Inlet Canal (see station 06434500), with other small diversions from the main stem and tributaries for irrigation. Total diversion for irrigation of about 60,000 acres upstream from station. Several observations of water quality were made during the year.

AVERAGE DISCHARGE.--40 years, 276 ft<sup>3</sup>/s (200,000 acre-ft/yr); median of yearly mean discharges, 232 ft<sup>3</sup>/s (168,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,400 ft<sup>3</sup>/s May 21, 1982 (gage height, 19.10 ft); no flow for many days in 1945, 1950, and Aug. 9, 1961.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,770 ft<sup>3</sup>/s at 0815 hours, Mar. 20 (gage height, 7.48 ft); minimum daily discharge, 18 ft<sup>3</sup>/s Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	191	54	58	24	20	150	83	39	385	261	403	336
2	140	52	47	26	21	140	81	38	350	240	403	329
3	113	52	40	30	22	130	80	36	345	216	359	389
4	93	50	37	33	24	110	83	35	351	203	312	413
5	82	50	37	35	26	100	83	67	296	219	279	376
6	84	50	38	34	27	180	76	57	259	216	257	317
7	91	49	41	31	28	200	67	53	226	215	269	313
8	84	48	44	29	29	220	63	44	204	243	244	335
9	77	48	46	28	28	250	59	51	166	263	242	365
10	73	50	43	26	25	270	56	61	134	244	224	282
11	68	52	40	24	26	300	55	101	162	225	228	163
12	67	52	35	25	28	320	53	164	183	273	244	116
13	65	52	30	26	30	350	51	163	181	309	236	102
14	63	54	28	28	31	370	55	155	161	328	221	92
15	59	56	26	28	33	450	55	169	148	348	236	77
16	58	56	25	29	37	540	52	139	145	358	250	68
17	58	56	24	31	41	700	50	147	150	351	280	64
18	57	54	24	28	45	1000	50	170	127	376	269	62
19	59	52	26	26	55	1500	50	197	103	368	262	59
20	62	49	32	24	70	2340	49	224	104	357	263	56
21	60	47	32	24	80	1220	49	243	140	344	253	56
22	57	51	29	25	90	747	53	241	163	336	281	59
23	57	52	26	26	100	454	53	248	173	317	334	59
24	57	58	23	28	110	306	51	240	187	299	338	56
25	57	47	25	28	110	244	46	256	195	252	347	56
26	57	54	28	28	100	197	44	300	180	256	371	55
27	58	19	35	27	140	158	44	510	193	256	358	58
28	57	58	35	26	160	140	44	526	225	252	340	58
29	52	85	30	25	---	109	44	482	238	273	322	55
30	52	75	26	23	---	93	41	408	247	303	338	56
31	54	---	24	18	---	83	---	384	---	380	345	---
TOTAL	2262	1582	1034	843	1536	13371	1720	5948	6121	8881	9108	4882
MEAN	73.0	52.7	33.4	27.2	54.9	431	57.3	192	204	286	294	163
MAX	191	85	58	35	160	2340	83	526	385	380	403	413
MIN	52	19	23	18	20	83	41	35	103	203	221	55
AC-FT	449	3140	2050	1670	3050	26520	3410	11800	12140	17620	18070	9680
CAL YR 1984	TOTAL	141894		MEAN	388	MAX	5910	MIN	11	AC-FT	281400	
WTR YR 1985	TOTAL	57288		MEAN	157	MAX	2340	MIN	18	AC-FT	113600	

## CHEYENNE RIVER BASIN

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06437000 BELLE FOURCHE RIVER NEAR STURGIS, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1953 to September 1958, October 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: August 1954 to September 1958, October 1968 to September 1971, October 1973 to current year.

WATER TEMPERATURE: August 1954 to September 1958, October 1968 to September 1971, October 1974 to current year.

REMARKS.--Samples collected once daily by observer.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,000 microsiemens, May 16, 1981; minimum daily, 650 microsiemens, Feb. 15, 1971.

WATER TEMPERATURE: Maximum daily, 30.5°C, July 5, 1981; minimum daily, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum observed daily, 3,580 microsiemens, Mar. 5; minimum observed daily, 1,060 microsiemens, Mar. 22.

WATER TEMPERATURE: Maximum observed daily, 23.0°C, July 13, Aug. 31; minimum observed daily, 0.0°C on many days during winter period.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
OCT 1984												
30...	1430	56	2440	8.3	6.5	3.5	1300	1000	270	140	160	22
NOV												
30...	1120	70	2830	8.2	3.0	.0	1400	1120	280	160	220	26
DEC												
14...	1200	28	2730	8.0	.0	.0	1400	1180	310	160	210	24
JAN 1985												
14...	1240	27	2750	8.0	-3.5	.0	1400	1050	300	150	220	26
FEB												
21...	1400	79	2350	8.1	7.5	.0	1200	942	270	130	150	21
MAR												
25...	1230	241	1480	7.9	13.0	8.0	550	442	120	62	140	35
APR												
11...	1315	55	2420	8.5	29.5	17.5	1200	1050	240	150	200	26
MAY												
03...	1030	35	2330	8.3	28.0	19.0	1000	857	210	120	170	26
JUN												
12...	0945	182	1970	8.2	16.0	14.5	890	743	210	89	130	24
JUL												
12...	1015	237	1780	8.2	33.0	24.0	870	742	210	85	100	20
AUG												
13...	1130	247	1910	8.6	18.5	17.0	960	817	230	93	120	21
SEP												
12...	1100	124	1990	8.5	20.0	18.0	900	738	200	98	130	24



## CHEYENNE RIVER BASIN

06437000 BELLE FOURCHE RIVER NEAR STURGIS, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO')	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)
OCT 1984												
30...	2	9.4	205	1300	25	.50	5.2	--	2100	2.8	1.7	.020
NOV												
30...	3	9.6	244	1500	36	.50	4.3	--	2400	3.2	4.5	<.010
DEC												
14...	2	10	259	1600	37	.50	5.9	--	2500	3.4	4.1	.010
JAN 1985												
14...	3	9.4	319	1500	36	.50	8.1	--	2400	3.3	4.2	.010
FEB												
21...	2	9.6	269	1200	28	.40	2.5	--	2000	2.7	2.8	.020
MAR												
25...	3	7.2	114	670	17	.30	6.0	--	1100	1.5	2.1	.630
APR												
11...	3	10	165	1300	32	.50	2.1	--	2000	2.8	2.1	.020
MAY												
03...	2	14	163	1200	29	.50	<1.0	--	--	--	.19	.010
JUN												
12...	2	7.9	149	1000	17	.50	3.9	--	1500	2.1	1.2	.050
JUL												
12...	2	9.8	134	900	12	.50	4.4	--	1400	1.9	.33	.050
AUG												
13...	2	9.0	147	980	16	.50	4.9	--	1500	2.1	.55	.020
SEP												
12...	2	8.7	166	1000	17	.50	5.2	--	1600	2.1	.82	.030

DATE	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
OCT 1984											
30...	--	<.010	<.010	7	420	1	<1	<1	3	80	<1
NOV											
30...	--	<.010	<.010	--	430	--	--	--	--	--	--
DEC											
14...	--	<.010	<.010	--	440	--	--	--	--	--	--
JAN 1985											
14...	--	<.010	<.010	--	410	--	--	--	--	--	--
FEB											
21...	--	<.010	<.010	--	330	--	--	--	--	--	--
MAR											
25...	--	<.010	<.010	--	180	--	--	--	--	--	--
APR											
11...	--	<.010	<.010	--	340	--	--	--	--	--	--
MAY											
03...	--	<.010	<.010	--	370	--	--	--	--	--	--
JUN											
12...	.15	<.010	<.010	--	260	--	--	--	--	--	--
JUL											
12...	.15	<.010	<.010	--	270	--	--	--	--	--	--
AUG											
13...	.06	<.010	<.010	14	290	<1	<1	<1	2	6	<1
SEP											
12...	.09	.010	<.010	--	300	--	--	--	--	--	--

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	CYANIDE TOTAL (MG/L AS CN)
OCT 1984											
30...	130	100	<.1	2	15	5	<1	3000	<1	<10	<.01
AUG 1985											
13...	99	8	<.1	7	4	5	2	2800	<1	4	<.01

## CHEYENNE RIVER BASIN

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06437000 BELLE FOURCHE RIVER NEAR STURGIS, SD--Continued

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25° CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1800	2700	2940	2880	2930	2860	2240	2300	1670	1820	1820	1930
2	1900	2770	2880	2920	3070	2910	2280	2280	1630	1780	1810	1890
3	2000	2540	3000	2790	3110	2940	2330	2250	1700	1770	1780	1830
4	2020	2480	2910	2830	3240	3400	2510	2250	1630	1780	1790	1780
5	2120	2600	2910	2930	3350	3580	2650	2440	1680	1800	1810	1800
6	2130	2520	3100	2890	3300	3410	2510	2770	1740	1780	1800	1840
7	2080	2570	3100	2870	3210	3180	2430	2110	1700	1790	1810	1880
8	2120	2530	3120	2740	3350	2800	2400	2100	1730	1810	1870	1870
9	2150	2480	3100	2810	3040	2600	2410	2100	1780	1800	1880	1830
10	2160	2510	3160	2870	3090	2610	2420	2120	1800	1770	1920	1760
11	2200	2510	3050	2790	2820	2620	2460	1990	1870	1790	1910	1880
12	2240	2580	2970	2800	2780	2540	2430	3340	1930	1800	1900	1990
13	2280	2720	2860	2720	2630	2450	2590	3500	1900	1780	1920	2080
14	2270	2720	2860	2740	2670	2430	2610	2370	1800	1780	1920	2160
15	2300	2820	2900	2810	2590	2280	2500	1940	1770	1780	1930	2280
16	2320	2820	2840	2720	2600	2210	2430	2310	1850	1770	1910	2340
17	2350	2760	3090	2890	2770	1720	2350	2210	1830	1740	1910	2360
18	2350	2860	3130	2830	2760	1880	2300	2490	1820	1740	1900	2420
19	2330	2960	3190	2760	2750	1720	2290	2410	1860	1750	1910	2400
20	2330	2870	3210	2740	2630	1370	2300	2180	1910	1750	1880	2440
21	2300	3000	3180	2780	2280	1110	2300	1950	2090	1760	1930	2450
22	2320	---	3130	2850	2420	1060	2280	1900	1880	1770	1940	2460
23	2310	2860	3100	2860	2300	1270	2180	1880	1880	1750	1900	2450
24	2330	2810	2970	2770	2450	1290	2260	1810	1880	1750	1890	2390
25	2350	2630	3150	2810	2770	1620	2180	1860	1760	1750	1870	2350
26	2360	2680	3090	2870	3120	1880	2210	1840	1800	1800	1870	2360
27	2400	2900	2910	2860	2880	1980	2190	1760	1860	1820	1830	2360
28	2420	2960	2880	2790	2900	2080	2220	1790	1910	1790	1830	2380
29	2430	2980	2810	2770	---	2120	2280	1690	1870	1800	1900	2380
30	2430	2960	2950	2730	---	2180	2320	1650	1830	1810	1930	2360
31	2450	---	2920	2750	---	2210	---	1670	---	1840	1940	---

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
RANDOM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	.0	.0	.0	.0	.0	2.5	12.5	15.0	21.0	16.0	19.0
2	8.0	.0	.0	.0	.0	1.0	6.5	14.0	14.0	20.0	20.0	17.0
3	10.0	1.0	.0	.0	.0	.0	7.0	17.5	11.0	22.0	20.0	18.0
4	11.0	1.5	.0	.0	.0	.0	8.0	17.0	12.0	19.5	20.0	18.0
5	14.0	.0	.0	.0	.0	.0	2.5	12.5	14.0	19.0	20.0	18.0
6	14.0	.0	.0	.0	.0	.0	5.0	9.5	17.5	21.0	20.0	18.0
7	12.5	2.5	.0	.0	.0	.0	4.0	13.0	20.0	21.0	21.0	17.0
8	12.0	2.5	.0	.0	.0	.0	1.0	15.0	21.0	21.0	19.0	15.0
9	11.5	2.5	.0	.0	.0	.0	4.0	17.0	18.0	21.5	19.0	14.0
10	12.5	.0	.0	.0	.0	.0	8.0	19.0	15.5	22.5	16.5	15.0
11	11.5	.0	.0	.0	.0	.5	9.0	6.0	13.0	22.0	18.5	15.0
12	13.0	.0	.0	.0	.0	1.0	11.0	10.0	17.0	22.0	18.0	16.0
13	12.0	.0	.0	.0	.0	.0	10.0	11.5	14.5	23.0	16.0	15.0
14	11.0	5.0	.0	.0	.0	1.0	10.0	10.5	18.0	22.0	15.5	16.0
15	7.0	.0	.0	.0	.0	1.0	11.5	12.0	17.0	20.0	16.0	18.0
16	5.0	.0	.0	.0	.0	1.5	11.5	12.5	19.5	21.0	17.0	16.0
17	2.5	.0	.0	.0	.0	2.0	11.0	15.0	16.0	21.5	14.0	16.0
18	4.5	.0	.0	.0	.0	2.0	15.5	15.5	12.5	21.0	15.0	16.5
19	2.0	.0	.0	.0	.0	1.0	16.0	16.0	19.0	21.0	15.5	16.0
20	1.0	.0	.0	.0	.0	1.0	9.0	15.5	17.0	20.0	17.0	7.5
21	1.5	.0	.0	.0	.0	2.0	10.0	17.0	18.0	22.0	20.0	10.0
22	1.0	---	.0	.0	.0	3.0	9.0	17.5	16.0	21.0	20.0	12.0
23	1.0	.5	.0	.0	.0	6.0	11.0	16.0	18.0	21.0	19.0	7.0
24	1.5	.5	.0	.0	.0	1.5	8.0	19.0	19.0	20.0	17.0	4.0
25	6.0	1.0	.0	.0	.0	4.0	6.0	19.5	17.0	19.0	17.5	6.5
26	5.0	.0	.0	.0	.5	5.0	8.0	19.0	15.5	20.5	17.5	4.5
27	5.0	.0	.0	.0	1.0	3.0	6.5	15.5	14.0	22.0	19.0	8.0
28	.0	.0	.0	.0	1.0	2.5	11.5	15.5	15.0	22.0	20.0	4.0
29	.0	.0	.0	.0	---	.0	13.0	17.5	15.0	20.0	20.0	4.0
30	.0	.0	.0	.0	---	.0	13.5	16.5	19.0	17.0	21.5	4.5
31	.0	---	.0	.0	---	5.0	---	14.0	---	16.0	23.0	---

## CHEYENNE RIVER BASIN

06438000 BELLE FOURCHE RIVER NEAR ELM SPRINGS, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 44°22'11", long 102°33'56", in NE¼NE¼ sec.29, T.5 N., R.13 E., Meade County, Hydrologic Unit 10120202, on right bank 10 ft downstream from highway bridge, 4.3 mi northwest of Elm Springs, and 4.7 mi downstream from Hay Creek.

DRAINAGE AREA.--7,210 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1928 to June 1932, March 1934 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 786: Drainage area. WSP 926: 1929, 1931(M), 1935, 1937.

GAGE.--Water-stage recorder. Datum of gage is 2,171.60 ft above National Geodetic Vertical Datum of 1929. Prior to July 27, 1939, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Dec. 1 to Mar. 17, which are poor. Flow regulated by Keyhole Dam, usable capacity, 191,600 acre-ft, 304 mi upstream since Feb. 12, 1952. At a point 133 mi above station, water is diverted to Belle Fourche Reservoir (see station 06435000), through Inlet Canal near Belle Fourche (see station 06434500), with other smaller diversions from the main stem and tributaries for irrigation. Total diversion for irrigation of about 60,000 acres upstream from station.

AVERAGE DISCHARGE.--54 years (water years 1929-31, 1935-85), 361 ft<sup>3</sup>/s (261,500 acre-ft/yr); median of yearly mean discharges, 360 ft<sup>3</sup>/s (261,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,100 ft<sup>3</sup>/s June 8, 1964 (gage height, 15.90 ft), from rating curve extended above 23,000 ft<sup>3</sup>/s; maximum gage height, 18.22 ft May 21, 1982; no flow for many days in 1936-37, 1939-40, 1961-62, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1927 reached a stage of 21.8 ft. Flood in spring of 1933 reached a stage of about 20 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,630 ft<sup>3</sup>/s at 0630 hours, Mar. 20 (gage height, 6.99 ft); minimum daily discharge, 18 ft<sup>3</sup>/s Feb. 6-8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	279	58	54	35	22	30	120	36	378	233	408	335
2	181	37	45	38	20	29	114	37	378	249	413	324
3	130	60	46	43	20	28	107	33	362	228	401	329
4	103	89	47	45	19	27	108	31	358	204	364	398
5	84	83	50	47	19	27	108	28	357	188	335	413
6	78	64	52	47	18	28	107	27	298	201	293	390
7	72	60	52	45	18	30	103	48	252	204	238	344
8	77	60	52	43	18	32	93	41	216	205	258	356
9	70	65	51	40	19	35	86	43	193	227	217	385
10	66	74	50	37	19	40	79	37	165	244	212	411
11	64	70	43	32	19	45	72	40	141	224	196	304
12	62	92	46	35	20	70	66	64	141	208	196	190
13	56	82	46	40	20	110	62	128	166	255	202	136
14	56	77	45	45	20	150	62	161	168	300	202	109
15	53	83	42	50	21	200	61	159	155	320	192	100
16	51	61	36	52	22	300	62	158	145	353	222	92
17	49	70	34	54	22	500	62	141	132	364	217	79
18	53	80	34	52	23	755	60	145	136	372	244	72
19	54	68	35	50	24	1290	56	157	128	401	242	76
20	54	54	39	45	25	2240	56	182	103	408	240	73
21	56	53	38	45	26	1860	51	210	92	400	242	68
22	59	77	37	45	26	1280	50	220	110	397	233	58
23	57	86	35	45	27	891	57	220	146	387	263	63
24	56	91	31	50	28	590	56	220	157	371	318	66
25	59	95	33	52	28	439	50	217	172	340	327	68
26	59	113	37	50	29	376	43	243	190	269	343	67
27	59	58	40	48	31	288	44	311	174	278	363	64
28	58	37	36	45	31	226	42	506	185	264	349	56
29	60	41	32	40	---	177	40	501	209	245	335	59
30	63	57	30	35	---	150	39	459	237	300	308	57
31	64	---	32	26	---	128	---	401	---	324	332	---
TOTAL	2342	2095	1280	1356	634	12371	2116	5204	6044	8963	8705	5542
MEAN	75.5	69.8	41.3	43.7	22.6	399	70.5	168	201	289	281	185
MAX	279	113	54	54	31	2240	120	506	378	408	413	413
MIN	49	37	30	26	18	27	39	27	92	188	192	56
AC-FT	465	4160	2540	2690	1260	24540	4200	10320	11990	17780	17270	10990
CAL YR 1984 TOTAL	178329.5			MEAN	487	MAX	8380	MIN	2.0	AC-FT	353700	
WTR YR 1985 TOTAL	56652			MEAN	155	MAX	2240	MIN	18	AC-FT	112400	

06438000 BELLE FOURCHE RIVER NEAR ELM SPRINGS, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1974 to September 1981.

WATER TEMPERATURE: October 1974 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 5,000 microsiemens, Jan. 31, Feb. 7-11; minimum daily, 800 microsiemens, June 19, 1976.

WATER TEMPERATURE: Maximum daily, 33.5°C, June 25, 1977; minimum, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1984												
30...	1030	63	2430	8.3	4.5	1.0	4.6	712	--	--	K3	K11
DEC												
12...	1430	46	3230	8.1	-2.0	.0	.90	695	12.5	95	K3	K4
FEB 1985												
20...	1615	25	2990	8.2	6.0	.0	4.3	695	14.1	107	K11	K25
APR												
18...	1130	63	2750	8.6	29.0	20.0	8.5	694	9.5	116	K7	K6
JUN												
18...	1045	145	1950	8.1	21.0	16.0	9.4	714	9.8	107	K12	23
AUG												
21...	1300	238	1890	8.5	34.0	25.0	21	701	8.6	114	K18	K16

DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
OCT 1984												
30...	1200	1020	250	140	180	24	2	9.6	189	1300	29	.40
DEC												
12...	1600	1310	340	190	280	27	3	12	320	2000	49	.50
FEB 1985												
20...	1600	1250	330	180	240	25	3	12	320	1700	38	.40
APR												
18...	1400	1210	280	160	250	28	3	12	150	1500	40	.40
JUN												
18...	890	746	200	93	130	24	2	9.0	140	1000	15	.50
AUG												
21...	910	767	210	92	120	22	2	8.9	140	980	73	.50

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
OCT 1984												
30...	3.3	2300	2000	3.1	391	1.3	.090	.12	.30	.010	--	.010
DEC												
12...	4.0	3310	3100	4.5	411	4.2	.130	.17	.70	<.010	--	<.010
FEB 1985												
20...	2.3	2880	2700	3.9	194	2.9	.150	.19	1.5	.020	--	<.010
APR												
18...	<1.0	2540	--	3.5	432	1.3	.070	.09	.80	.010	--	.030
JUN												
18...	3.0	1680	1500	2.3	658	.28	.140	.18	.40	.030	.09	<.010
AUG												
21...	3.8	1650	1600	2.2	1060	.46	.080	.10	.80	.060	.18	.010



## CHEYENNE RIVER BASIN

06438000 BELLE FOURCHE RIVER NEAR ELM SPRINGS, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
OCT 1984												
30...	<.010	10	4	<100	<10	1	<1	<1	<1	80	1	130
DEC												
12...	<.010	--	--	--	--	--	--	--	--	--	--	--
FEB 1985												
20...	<.010	10	5	<100	<10	<1	<5	<1	1	20	<1	160
APR												
18...	.020	--	--	--	--	--	--	--	--	--	--	--
JUN												
18...	<.010	10	7	37	<.5	<1	<1	<3	2	4	5	110
AUG												
21...	<.010	<10	11	45	<.5	<1	<1	<3	1	<3	2	100
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 1984												
30...	50	<.1	2	4	4	<1	3100	<1	<10	32	5.4	41
DEC												
12...	--	--	--	--	--	--	--	--	--	48	6.0	45
FEB 1985												
20...	130	<.1	<1	3	7	<1	3600	5	20	257	17	87
APR												
18...	--	--	--	--	--	--	--	--	--	26	4.4	98
JUN												
18...	10	<.1	10	5	4	1	2600	<6	14	145	57	100
AUG												
21...	6	<.1	<10	3	5	<1	2700	<6	10	190	122	99

## 06439000 CHERRY CREEK NEAR PLAINVIEW, SD

LOCATION (REVISED).--Lat 44°44'35", long 102°03'11", in SW¼ sec.16, T.9 N., R.17 E., Meade County, Hydrologic Unit 10120113, on left upstream wingwall of bridge on State Highway 73, 0.2 mi downstream from small right-bank tributary, 6.2 mi downstream from Red Owl Creek, and 11 mi northeast of Plainview.

DRAINAGE AREA.--1,190 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1945 to current year. Monthly discharge only for October and November 1945, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,157.91 ft (revised) above National Geodetic Vertical Datum of 1929, datum in error since 1945 based on NGVD levels of 1963. Prior to June 8, 1948, nonrecording gage at same site and datum. Prior to Sept. 27, 1985, recording gage at site 100 ft downstream at same datum.

REMARKS.--Records good except those for winter period, Feb. 22 to Mar. 18, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--40 years, 45.3 ft<sup>3</sup>/s (32,820 acre-ft/yr); median of yearly mean discharges, 25 ft<sup>3</sup>/s (18,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,500 ft<sup>3</sup>/s Apr. 1, 1952 (gage height, 22.63 ft); no flow for long periods in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 21	0615	*1,390	*10.08	No other peak greater than base discharge.			

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	10	60	4.1	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	12	50	3.7	1.1	.00	.00	.00
3	.00	.00	.00	.00	.00	12	43	3.5	1.3	.00	.00	.00
4	.00	.00	.00	.00	.00	11	38	3.1	.59	.00	.00	.00
5	.00	.00	.00	.00	.00	10	34	2.8	.26	.00	.00	.00
6	.00	.00	.00	.00	.00	9.5	31	2.4	.45	.00	.00	.00
7	.00	.00	.00	.00	.00	9.0	27	2.1	.52	.00	.00	.00
8	.00	.00	.00	.00	.00	10	22	2.0	.25	.00	.00	.00
9	.00	.00	.00	.00	.00	20	19	1.5	.11	.00	.00	.00
10	.00	.00	.00	.00	.00	50	18	1.4	.25	.00	.00	.00
11	.00	.00	.00	.00	.00	70	16	1.3	.26	.00	.00	.00
12	.00	.00	.00	.00	.00	80	15	1.1	.13	.00	.00	.00
13	.00	.00	.00	.00	.00	80	15	1.1	.09	.00	.00	.00
14	.00	.00	.00	.00	.00	75	13	1.0	1.1	.00	.00	.00
15	.00	.00	.00	.00	.00	75	13	.89	.69	.00	.00	.00
16	.00	.00	.00	.00	.00	70	12	.68	.25	.00	.00	.00
17	.00	.00	.00	.00	.00	90	11	.59	.06	.00	.00	.00
18	.00	.00	.00	.00	.00	200	9.7	.51	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	456	9.2	.37	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	911	10	.30	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	1350	8.9	.24	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	1300	8.0	.13	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	849	7.6	.09	.00	.00	.00	.00
24	.00	.00	.00	.00	.05	420	6.9	.03	.00	.00	.00	.00
25	.00	.00	.00	.00	.50	267	6.1	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	1.0	192	5.6	.03	.00	.00	.00	.00
27	.00	.00	.00	.00	2.0	143	5.4	.05	.00	.00	.00	.00
28	.00	.00	.00	.00	5.0	111	5.2	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	95	4.8	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	81	4.3	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	69	---	.02	---	.00	.00	---
TOTAL	.00	.00	.00	.00	8.55	7137.5	528.7	35.03	7.41	.00	.00	.00
MEAN	.00	.00	.00	.00	.31	230	17.6	1.13	.25	.00	.00	.00
MAX	.00	.00	.00	.00	5.0	1350	60	4.1	1.3	.00	.00	.00
MIN	.00	.00	.00	.00	.00	9.0	4.3	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	17	14160	1050	69	15	.00	.00	.00
CAL YR 1984	TOTAL	20924.79		MEAN	57.2	MAX	3540	MIN	.00	AC-FT	41500	
WTR YR 1985	TOTAL	7717.19		MEAN	21.1	MAX	1350	MIN	.00	AC-FT	15310	

## CHEYENNE RIVER BASIN

06439300 CHEYENNE RIVER AT CHERRY CREEK, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 44°36'10", long 101°29'24", in NE¼NW¼ sec.5, T.7 N., R.22 E., Ziebach County, Hydrologic Unit 10120112, on left bank 0.5 mi east of village of Cherry Creek, 0.5 mi downstream from Cherry Creek, and 1.7 mi upstream from Plum Creek.

DRAINAGE AREA.--23,900 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,699.29 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 18, 1960, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter periods, Nov. 18-21 and Nov. 25 to Mar. 16, which are poor. Flow regulated by Angostura Dam 197 mi upstream (see station 06401000) since October 1949 and upstream on Rapid Creek since 1956 and Belle Fourche River since 1952. Flow also affected by diversions for irrigation of about 70,000 acres and return flow from irrigated areas. Gage-height telemeter and U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--25 years, 816 ft<sup>3</sup>/s (591,200 acre-ft/yr); median of yearly mean discharges, 740 ft<sup>3</sup>/s (536,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,900 ft<sup>3</sup>/s May 22, 1982 (gage height, 15.77 ft); no flow Jan. 6 to Feb. 2, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,320 ft<sup>3</sup>/s at 1430 hours, Mar. 17 (gage height, 6.40 ft); minimum daily, 55 ft<sup>3</sup>/s Feb. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	412	247	130	130	80	230	482	214	443	261	522	274
2	397	220	110	140	70	220	428	213	401	252	587	281
3	344	183	90	150	55	200	400	219	404	247	497	276
4	287	204	90	160	55	200	381	190	412	266	421	279
5	260	211	85	170	60	220	365	181	407	242	375	291
6	242	213	80	160	60	220	360	177	393	213	321	335
7	226	222	90	160	60	240	382	176	379	195	260	327
8	217	215	120	150	62	250	356	163	322	207	244	309
9	211	214	160	140	65	250	326	154	298	201	210	315
10	209	215	200	130	70	250	299	157	285	194	209	752
11	209	218	190	115	90	270	286	135	270	205	182	659
12	209	239	180	130	110	270	269	134	270	203	184	537
13	204	244	180	140	120	280	262	131	330	202	152	370
14	196	242	190	160	130	300	252	136	301	196	149	286
15	190	282	200	160	130	500	244	163	285	224	223	293
16	184	290	190	170	140	1700	238	212	252	252	243	309
17	184	242	180	180	140	5050	232	222	215	265	191	245
18	182	240	170	180	150	4210	233	219	198	347	177	200
19	180	250	180	170	150	3950	234	206	185	480	172	184
20	178	250	190	150	160	4280	244	198	181	392	178	173
21	176	240	180	160	160	5200	252	202	169	367	186	173
22	178	236	170	160	180	3300	253	214	166	341	686	176
23	183	219	170	180	200	2500	261	253	160	295	421	174
24	188	220	150	180	200	2100	242	252	153	312	305	178
25	190	210	160	170	210	1750	237	239	151	303	281	181
26	189	200	160	180	200	1500	228	247	167	272	297	185
27	180	200	170	170	200	1300	218	266	178	247	325	199
28	178	180	160	150	230	781	211	289	193	212	335	199
29	184	170	150	140	---	681	207	440	205	222	288	192
30	190	160	130	120	---	595	213	575	210	231	276	187
31	196	---	120	100	---	536	---	529	---	352	253	---
TOTAL	6753	6676	4725	4755	3537	43333	8595	7106	7983	8198	9150	8539
MEAN	218	223	152	153	126	1398	287	229	266	264	295	285
MAX	412	290	200	180	230	5200	482	575	443	480	686	752
MIN	176	160	80	100	55	200	207	131	151	194	149	173
AC-FT	1339	13240	9370	9430	7020	85950	17050	14090	15830	16260	18150	16940
CAL YR 1984	TOTAL	387821		MEAN	1060	MAX	17400	MIN	50	AC-FT	769200	
WTR YR 1985	TOTAL	119350		MEAN	327	MAX	5200	MIN	55	AC-FT	236700	

## CHEYENNE RIVER BASIN

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06439300 CHEYENNE RIVER AT CHERRY CREEK, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1971 to current year.

## PERIOD OF DAILY RECORD.--

SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976.

SPECIFIC CONDUCTANCE: January 1975 to September 1976.

WATER TEMPERATURE: January 1975 to September 1976, October 1977 to September 1978.

INSTRUMENTATION.--Water-quality monitor June 16, 1977, to September 1979.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily mean, 66,000 mg/L, May 25, 1976; minimum daily mean, 80 mg/L, Nov. 15-17, 1972.

SEDIMENT LOAD: Maximum daily, 2,530,000 tons, June 12, 1972; minimum daily, 15 tons, Dec. 14, 1973.

SPECIFIC CONDUCTANCE: Maximum daily, 3,400 microsiemens, Jan. 27, 28, 1975; minimum daily, 620 microsiemens, Apr. 25, 1975.

WATER TEMPERATURE: Maximum daily, 35.0°C, Aug. 26, 1975; minimum daily, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	
DATE	TIME												
NOV 1984													
14...	1025	243	2040	8.4	11.0	3.5	8.5	714	12.0	97	K8	K55	
FEB 1985													
08...	1010	62	3070	7.8	-2.0	.0	2.6	719	--	--	<2	<2	
MAY													
03...	1220	227	2510	8.2	20.5	19.5	31	733	8.6	98	K76	K55	
AUG													
22...	1150	790	1930	7.6	21.0	23.0	100	725	6.1	75	550	250	
		HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 1984													
14...	920	744	220	90	190		31	3	11	180	990	65	.40
FEB 1985													
08...	1400	1130	330	150	290		30	3	14	320	1700	91	.50
MAY													
03...	900	762	210	90	260		38	4	16	137	1200	82	.50
AUG													
22...	640	540	170	51	200		40	4	14	97	900	55	.60
DATE		SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 1984													
14...	2.0	1750	1700	2.4	1150	.52	.060	.08	.40	.010	--	.010	
FEB 1985													
08...	4.5	2870	2800	3.9	480	2.3	.150	.19	1.0	.050	--	.040	
MAY													
03...	2.6	2050	1900	2.8	1260	<.10	.090	.12	.70	.070	--	.020	
AUG													
22...	13	1540	1500	2.1	3280	.65	.220	.28	1.1	13.0	40	.070	



## CHEYENNE RIVER BASIN

06439300 CHEYENNE RIVER AT CHERRY CREEK, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 1985												
14...	<.010	30	3	<100	<10	<1	<1	4	15	30	1	110
FEB 1985												
08...	.040	<10	3	<100	<10	1	<1	1	3	30	<1	170
MAY												
03...	<.010	<10	4	50	<.5	<1	<1	<3	25	<3	<1	170
AUG												
22...	<.010	<10	5	74	<.5	<1	<1	<3	60	15	<1	110
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDEDED (MG/L)	MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY)	SUSP. SIEVE DIAM. & FINER THAN .062 MM
NOV 1984												
14...	30	<.1	1	4	3	<1	2500	<1	10	--	--	--
FEB 1985												
08...	110	<.1	1	7	6	<1	3700	4	30	--	--	--
MAY												
03...	15	<.1	<10	5	2	<1	2700	<6	<3	--	--	--
AUG												
22...	10	.6	<10	7	4	<1	1800	<6	17	28600	61000	--

## CHEYENNE RIVER BASIN

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06439430 COTTONWOOD CREEK NEAR CHERRY CREEK, SD

LOCATION.--Lat 44°40'28", long 101°24'16", in NW¼NW¼NE¼ sec.12, T.8 N., R.22 E., Ziebach County, Hydrologic Unit 10120112, on right bank at upstream side of highway bridge, 2.1 mi upstream from mouth, and 6.7 mi northeast of Cherry Creek.

DRAINAGE AREA.--120 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,810 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,700 ft<sup>3</sup>/s June 17, 1984 (gage height, 9.46 ft); no flow for long periods in each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 4,200 ft<sup>3</sup>/s May 18, 1982 (gage height, 13.03 ft), from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	1630	--	*5.57	No other peak greater than base discharge.			
Mar. 19	0800	*218	5.47				

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	5.6	1.7	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	5.0	1.4	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	4.5	1.3	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	4.1	1.2	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	3.8	1.1	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	3.6	.81	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	3.4	.41	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	3.2	.13	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	3.1	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	3.0	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	9.2	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	20	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	25	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	50	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	152	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	3.3	191	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	11	182	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	24	128	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	23	73	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	37	63	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	22	33	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	15	15	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	15	7.8	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	13	6.0	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	6.2	4.6	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	5.4	4.0	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	3.8	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	2.8	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	2.1	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	174.90	1017.4	8.05	.00	.00	.00	.00	.00
MEAN	.00	.00	.00	.00	6.25	32.8	.27	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	37	191	1.7	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	2.1	.00	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	347	2020	16	.00	.00	.00	.00	.00
CAL YR 1984	TOTAL	2116.36		MEAN	5.78	MAX	647	MIN	.00	AC-FT	4200	
WTR YR 1985	TOTAL	1200.35		MEAN	3.29	MAX	191	MIN	.00	AC-FT	2380	

## MISSOURI RIVER MAIN STEM

06439980 LAKE OAHE NEAR PIERRE, SD

LOCATION.--Lat 44°27'30", long 100°23'29", in NE<sup>1</sup> sec.1, T.111 N., R.80 W., 5th principal meridian, Hughes County, Hydrologic Unit 10130105, in Pier A of Control Tower No. 1 of powerhouse intake structure of dam on Missouri River, 6.0 mi northwest of Pierre, 7.1 mi upstream from Bad River, and at mile 1,072.3.

DRAINAGE AREA.--243,500 mi<sup>2</sup>, approximately.

PERIOD OF RECORD --August 1958 to current year (monthend contents only). Prior to October 1967, published as Oahe Reservoir near Pierre.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Jan. 14, 1958, nonrecording gages at various locations upstream from outlet works, Jan. 14, 1959, to Sept. 30, 1962, recorder in Tower No. 1 of outlet works, all at same datum.

REMARKS.--Reservoir is formed by an earthfill dam; storage began in August 1958. Maximum capacity, 23,338,000 acre-ft below elevation 1,620.0 ft (top of spillway gates). Normal maximum, 22,240,000 acre-ft below 1,617.0 ft, of which about 2,390,000 acre-ft is designated for flood control. Inactive storage, 5,451,000 acre-ft below elevation 1,540.0 ft. Dead storage, 1,970 acre-ft below elevation 1,425.0 ft (invert of lowest outlet tunnel). Figures given herein represent elevations at powerhouse intake structure and total contents adjusted for wind effect.

The spillway consists of a gated chute with flat crest at elevation 1,596.5 ft, 8 gates, 50 by 23.5 ft each; design capacity, 300,000 ft<sup>3</sup>/s. The outlet works consist of 7 turbines with a generating capacity of 85,000 kilowatts each. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Records of elevation and contents provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 22,681,000 acre-ft Aug. 22, 1975, affected by wind; minimum since initial filling, 14,815,000 acre-ft Sept. 25, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 20,212,000 acre-ft Apr. 7; minimum contents, 17,335,000 acre-ft Sept. 30.

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	1,610.23	19,959,000	-
Oct. 31 . . . . .	1,608.85	19,304,000	-655,000
Nov. 30 . . . . .	1,606.70	18,784,000	-520,000
Dec. 31 . . . . .	1,605.15	18,323,000	-461,000
CAL YR 1984 . . . . .	-	-	-160,000
Jan. 31 . . . . .	1,606.09	18,612,000	-289,000
Feb. 28 . . . . .	1,608.61	19,385,000	+773,000
Mar. 31 . . . . .	1,610.98	20,147,000	+762,000
Apr. 30 . . . . .	1,610.02	19,852,000	-295,000
May 31 . . . . .	1,609.66	19,723,000	-129,000
June 30 . . . . .	1,608.16	19,266,000	-457,000
July 31 . . . . .	1,605.37	18,429,000	-837,000
Aug. 31 . . . . .	1,603.19	17,762,000	-667,000
Sept. 30 . . . . .	1,601.70	17,335,000	-427,000
WTR YR 1985 . . . . .	-	-	-2,624,000

NOTE.--Lake free of ice Apr. 5.

06440000 MISSOURI RIVER AT PIERRE, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 44°22'25", long 100°22'20", in SE¼ sec.21, T.5 N., R.31 E., Hughes County, Hydrologic Unit 10140102, at discontinued gaging station, near right bank on downstream side of pier of Chicago and North Western Transportation Company bridge, 1.3 mi upstream from Bad River, 5.8 mi downstream from Oahe Dam, and at mile 1,006.5.

DRAINAGE AREA.--243,500 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1971 to September 1981.

WATER TEMPERATURE: July 1971 to September 1981.

COOPERATION.--Flow completely regulated by Lake Oahe (station 06439980) 5.8 mi upststream. Discharge provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 895 microsiemens, Dec. 17, 1980; minimum daily, 530 microsiemens, Dec. 24, 1974, Dec. 17, 1980.

WATER TEMPERATURE: Maximum daily, 24.0°C, July 31, Aug. 3, 1977, Aug. 21, 1980; minimum daily, 0.0°C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
DEC 1984												
06...	14:00	45500	730	8.1	-1.0	6.0	2.6	732	12.1	101	K1	K12
JAN 1985												
15...	14:30	22000	740	8.4	2.0	1.0	0.5	727	14.6	108	0	K1
MAR												
08...	14:00	13500	750	8.4	2.0	3.5	0.7	740	13.8	107	0	K15
APR												
30...	08:00	15000	791	8.5	10.0	5.0	2.1	748	12.5	100	K1	K6
JUN												
28...	10:15	41800	732	8.5	14.0	15.0	2.4	738	9.4	97	K1	K1
AUG												
19...	14:00	21800	726	8.4	24.0	19.5	1.0	736	7.6	86	K8	K17

DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
DEC 1984												
06...	240	78	59	23	72	39	2	4.7	165	230	11	0.5
JAN 1985												
15...	240	85	58	24	74	39	2	5.1	159	220	11	0.5
MAR												
08...	260	69	60	26	76	39	2	4.6	189	220	10	0.5
APR												
30...	250	78	59	24	73	39	2	4.9	169	220	11	0.5
JUN												
28...	260	110	64	24	71	37	2	4.2	152	210	11	0.5
AUG												
19...	240	88	58	24	69	38	2	4.4	156	200	11	0.5

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
DEC 1984												
06...	5.4	495	510	0.67	60800	<0.10	0.01	0.01	0.3	0.01	--	0.01
JAN 1985												
15...	5.5	511	490	0.69	30400	<0.10	<0.10	--	0.2	0.01	--	<0.01
MAR												
08...	5.7	502	520	0.68	18300	0.67	0.02	0.03	0.3	<0.01	--	<0.01
APR												
30...	5.3	504	500	0.69	20400	<0.10	0.03	0.04	0.5	<0.01	--	<0.01
JUN												
28...	5.4	500	480	0.68	56400	<0.10	0.05	0.06	0.6	0.02	0.06	<0.01
AUG												
19...	5.8	484	470	0.66	28500	<0.10	0.01	0.01	0.2	0.01	0.03	<0.01



## MISSOURI RIVER MAIN STEM

06440000 MISSOURI RIVER AT PIERRE, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
DEC 1984												
06...	--	<10	2	37	<0.5	<1	20	<3	1	5	2	52
JAN 1985												
15...	<0.01	--	--	--	--	--	--	--	--	--	--	--
MAR												
08...	<0.01	<10	1	42	<0.5	<1	<1	<3	3	<3	2	53
APR												
30...	<0.01	10	2	43	<0.5	<1	<1	<3	2	6	<1	54
JUN												
28...	<0.01	<10	1	46	<0.5	<1	<1	<3	5	<3	5	50
AUG												
19...	<0.01	--	--	--	--	--	--	--	--	--	--	--
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 1984												
06...	12	<0.1	<10	<2	1	<1	550	<6	31	22	2700	95
JAN 1985												
15...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
08...	8	<0.1	<10	6	1	<1	580	<6	4	24	875	75
APR												
30...	11	<0.1	<10	1	1	<1	560	<6	<3	32	1300	86
JUN												
28...	3	0.2	<10	2	1	<1	580	<6	10	31	3500	86
AUG												
19...	--	--	--	--	--	--	--	--	--	27	1590	89

## BAD RIVER BASIN

113

06441000 BAD RIVER NEAR MIDLAND, SD

LOCATION.--Lat 44°04'01", long 101°09'36", in NE¼NW¼ sec.7, T.1 N., R.25 E., Haakon County, Hydrologic Unit 10140102, on right bank at downstream side of bridge on State Highway 63, 0.4 mi southwest of Midland, 2.0 mi upstream from Mitchell Creek, and 3.7 mi upstream from Ash Creek.

DRAINAGE AREA.--1,460 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1945 to current year. Prior to February 1946 monthly discharge only, published in WSP 1309.

REVISED RECORDS.--WSP 2117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,849.14 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 21, 1961, nonrecording gage, and Feb. 21, 1961, to June 14, 1967, water-stage recorder at site 4.2 mi downstream at datum 15.72 ft lower. June 15 to July 26, 1967, nonrecording gage at site 30 ft upstream and July 27, 1967, to June 14, 1971, water-stage recorder at site 60 ft upstream, both at present datum.

REMARKS.--Records poor. Only daily discharges above 100 ft<sup>3</sup>/s are being published.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft<sup>3</sup>/s June 15, 1967 (gage height, 24.44 ft, from floodmarks, 20.10 ft, from floodmarks, at former site and datum), from rating curve extended above 16,000 ft<sup>3</sup>/s; no flow for many days in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 19	1130	*95	*5.60				

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

Daily discharge, in cubic feet per second, above 100 ft<sup>3</sup>/s are given herewith:

No daily flows above 100 ft<sup>3</sup>/s during year

## BAD RIVER BASIN

06441500 BAD RIVER NEAR FORT PIERRE, SD

LOCATION.--Lat 44°19'36", long 100°23'02", in NW¼NW¼ sec.10, T.4 N., R.31 E., Stanley County, Hydrologic Unit 10140102, on right bank at downstream side of highway bridge, 2.1 mi south of Fort Pierre, 4.3 mi downstream from Willow Creek, and 6.0 mi upstream from mouth.

DRAINAGE AREA.--3,107 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1928 to current year. Monthly discharge only for July 1932 to February 1934, published in WSP 1309.

REVISED RECORDS.--WSP 786: Drainage area. WSP 856: 1929(M), 1937.

GAGE.--Water-stage recorder. Datum of gage is 1,427.83 ft above National Geodetic Vertical Datum of 1929. Prior to July 10, 1951, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Feb. 12 to Mar. 15, which are poor. U.S. Weather Service gage-height telemeter and U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--57 years, 146 ft<sup>3</sup>/s (105,800 acre-ft/yr); median of yearly mean discharges, 99 ft<sup>3</sup>/s (71,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,800 ft<sup>3</sup>/s June 18, 1967 (gage height, 29.55 ft); no flow for long periods in each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1927 reached a stage of 30.89 ft, from floodmarks, discharge, about 55,000 ft<sup>3</sup>/s. Flood in July 1905 reached a stage about 2 ft higher than that in April 1927.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 15	1600	ice jam	*9.56	No other peak greater than base discharge.			
Mar. 16	0700	*2,480	9.54				

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	250	8.9	.68	2.4	.00	.00	.00
2	.00	.00	.00	.00	.00	200	7.0	.85	2.2	.00	.00	.00
3	.00	.00	.00	.00	.00	170	5.5	1.1	2.6	.00	.00	.00
4	.00	.00	.00	.00	.00	140	4.5	.85	4.8	.00	.00	.00
5	.00	.00	.00	.00	.00	120	4.0	.68	4.3	.00	.00	.00
6	.00	.00	.00	.00	.00	110	3.5	.50	2.0	.00	.00	.00
7	.00	.00	.00	.00	.00	110	3.0	.37	1.2	.00	.00	.00
8	.00	.00	.00	.00	.00	120	2.5	.31	5.6	.00	.00	.00
9	.00	.00	.00	.00	.00	120	2.2	.27	2.6	.00	.00	.00
10	.00	.00	.00	.00	.00	130	2.0	.27	2.1	.00	.00	.00
11	.00	.00	.00	.00	.00	150	2.0	.27	38	.00	.00	.00
12	.00	.00	.00	.00	.00	200	1.7	.23	16	.00	.00	.00
13	.00	.00	.00	.00	.00	300	1.3	.16	3.4	.00	.00	.00
14	.00	.00	.00	.00	.20	500	1.3	.16	1.7	.00	.00	.00
15	.00	.00	.00	.00	.50	1500	1.2	.12	1.1	.00	.00	.00
16	.00	.00	.00	.00	1.0	2120	.98	.12	.68	.00	.00	.00
17	.00	.00	.00	.00	2.0	1420	1.1	.10	.43	.00	.00	.00
18	.00	.00	.00	.00	6.0	1290	1.1	.10	.19	.00	.00	.00
19	.00	.00	.00	.00	10	1180	1.2	.10	.14	.00	.00	.00
20	.00	.00	.00	.00	50	846	2.1	.07	.03	.00	.00	.00
21	.00	.00	.00	.00	250	710	2.9	.07	.03	.00	.00	.00
22	.00	.00	.00	.00	225	586	2.0	.07	.03	.00	.00	.00
23	.00	.00	.00	.00	210	302	2.0	.03	.00	1.4	6.1	.00
24	.00	.00	.00	.00	210	165	1.8	.00	.00	7.5	.07	.00
25	.00	.00	.00	.00	200	109	1.4	.00	.03	2.8	.00	.00
26	.00	.00	.00	.00	190	85	1.2	.00	.07	.85	.00	.00
27	.00	.00	.00	.00	200	54	1.2	.03	.07	.31	.00	.00
28	.00	.00	.00	.00	270	37	.98	.07	.03	.19	.00	.00
29	.00	.00	.00	.00	---	23	.85	.16	.00	.00	.00	.00
30	.00	.00	.00	.00	---	14	.79	21	.00	.00	.00	.00
31	.00	---	.00	.00	---	12	---	5.8	---	.00	.00	---
TOTAL	.00	.00	.00	.00	1824.70	13073	72.20	34.54	91.73	13.05	6.17	.00
MEAN	.00	.00	.00	.00	65.2	422	2.41	1.11	3.06	.42	.20	.00
MAX	.00	.00	.00	.00	270	2120	8.9	21	38	7.5	6.1	.00
MIN	.00	.00	.00	.00	.00	12	.79	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	3620	25930	143	69	182	26	12	.00
CAL YR 1984	TOTAL	56049.92		MEAN	153	MAX	9030	MIN	.00	AC-FT	111200	
WTR YR 1985	TOTAL	15115.39		MEAN	41.4	MAX	2120	MIN	.00	AC-FT	29980	

06441500 BAD RIVER NEAR FORT PIERRE, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1945 to September 1953, October 1971 to current year.

## PERIOD OF DAILY RECORD.--

SUSPENDED-SEDIMENT DISCHARGE: October 1971 to current year.

WATER TEMPERATURE: October 1972 to June 1983.

REVISED RECORDS.--WDR SD-81-1: 1979-80.

REMARKS.--Records poor. No flow Oct. 1 to Jan. 1, Jan. 13-23, Aug. 22 to Sept. 30. Flow affected by ice Jan. 1 to Mar. 21. Sediment-discharge records prior to Oct. 1, 1971, on file in the District office, U.S. Army Corps of Engineers, Omaha, NE.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SEDIMENT CONCENTRATION: Maximum daily mean, 124,000 mg/L, July 17, 1981; minimum daily mean, 0 mg/L on many days each year.

SEDIMENT LOAD: Maximum daily, 949,000 tons, May 14, 1982; minimum daily, 0 ton on many days each year.

## EXTREMES FOR CURRENT YEAR.--

SEDIMENT CONCENTRATION: Maximum daily mean, 12,500 mg/L, Mar. 16; minimum daily mean, 0 mg/L on many days.

SEDIMENT LOAD: Maximum daily, 71,600 tons, Mar. 16; minimum daily, 0 ton on many days.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM
FEB 1985								
22...	1000	225	0	--	75	87	98	100
MAR								
15...	1015	946	1.0	100	70	80	95	--

## SUSPENDED-SEDIMENT DISCHARGE, IN TONS PER DAY, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	.00	0	.00	.00	0	.00
6	.00	0	.00	.00	0	.00	.00	0	.00
7	.00	0	.00	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	.00	0	.00
10	.00	0	.00	.00	0	.00	.00	0	.00
11	.00	0	.00	.00	0	.00	.00	0	.00
12	.00	0	.00	.00	0	.00	.00	0	.00
13	.00	0	.00	.00	0	.00	.00	0	.00
14	.00	0	.00	.00	0	.00	.00	0	.00
15	.00	0	.00	.00	0	.00	.00	0	.00
16	.00	0	.00	.00	0	.00	.00	0	.00
17	.00	0	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	.00	0	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	.00	0	.00	.00	0	.00	.00	0	.00
24	.00	0	.00	.00	0	.00	.00	0	.00
25	.00	0	.00	.00	0	.00	.00	0	.00
26	.00	0	.00	.00	0	.00	.00	0	.00
27	.00	0	.00	.00	0	.00	.00	0	.00
28	.00	0	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	.00	0	.00	.00	0	.00
30	.00	0	.00	.00	0	.00	.00	0	.00
31	.00	0	.00	---	---	---	.00	0	.00
TOTAL	0.00	---	0.00	0.00	---	0.00	0.00	---	0.00



## BAD RIVER BASIN

06441500 BAD RIVER NEAR FORT PIERRE, SD--Continued

SUSPENDED-SEDIMENT DISCHARGE, IN TONS PER DAY, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
JANUARY			FEBRUARY			MARCH			
1	.00	0	.00	.00	0	.00	250	2990	2020
2	.00	0	.00	.00	0	.00	200	2300	1240
3	.00	0	.00	.00	0	.00	170	1800	826
4	.00	0	.00	.00	0	.00	140	1500	567
5	.00	0	.00	.00	0	.00	120	1300	421
6	.00	0	.00	.00	0	.00	110	1200	356
7	.00	0	.00	.00	0	.00	110	1100	327
8	.00	0	.00	.00	0	.00	120	1100	356
9	.00	0	.00	.00	0	.00	120	1200	389
10	.00	0	.00	.00	0	.00	130	1200	421
11	.00	0	.00	.00	0	.00	150	1300	526
12	.00	0	.00	.00	0	.00	200	1400	756
13	.00	0	.00	.00	0	.00	300	3750	3040
14	.00	0	.00	.20	5	.00	500	8700	11700
15	.00	0	.00	.50	20	.03	1500	12100	49000
16	.00	0	.00	1.0	30	.08	2120	12500	71600
17	.00	0	.00	2.0	40	.22	1420	10000	38300
18	.00	0	.00	6.0	50	.81	1290	8000	27900
19	.00	0	.00	10	188	5.1	1180	6000	19100
20	.00	0	.00	50	6070	819	846	3500	7990
21	.00	0	.00	250	7390	4990	710	2500	4790
22	.00	0	.00	225	6370	3870	586	1700	2690
23	.00	0	.00	210	5600	3180	302	1300	1060
24	.00	0	.00	210	4660	2640	165	1000	445
25	.00	0	.00	200	3720	2010	109	850	250
26	.00	0	.00	190	3080	1580	85	700	161
27	.00	0	.00	200	3100	1670	54	600	87
28	.00	0	.00	270	3400	2480	37	550	55
29	.00	0	.00	---	---	---	23	500	31
30	.00	0	.00	---	---	---	14	450	17
31	.00	0	.00	---	---	---	12	420	14
TOTAL	0.00	---	0.00	1824.70	---	23245.24	13073	---	246435
APRIL			MAY			JUNE			
1	8.9	400	9.6	.68	300	.55	2.4	635	4.1
2	7.0	380	7.2	.85	350	.80	2.2	590	3.5
3	5.5	360	5.3	1.1	400	1.2	2.6	640	4.5
4	4.5	350	4.3	.85	380	.87	4.8	740	9.6
5	4.0	340	3.7	.68	350	.64	4.3	735	8.5
6	3.5	330	3.1	.50	340	.46	2.0	660	3.6
7	3.0	320	2.6	.37	330	.33	1.2	565	1.8
8	2.5	310	2.1	.31	320	.27	5.6	725	11
9	2.2	310	1.8	.27	310	.23	2.6	645	4.5
10	2.0	310	1.7	.27	308	.22	2.1	590	3.3
11	2.0	305	1.6	.27	300	.22	38	970	100
12	1.7	301	1.4	.23	310	.19	16	885	38
13	1.3	300	1.1	.16	310	.13	3.4	520	4.8
14	1.3	290	1.0	.16	320	.14	1.7	363	1.7
15	1.2	280	.91	.12	340	.11	1.1	320	.95
16	.98	270	.71	.12	350	.11	.68	280	.51
17	1.1	280	.83	.10	371	.10	.43	250	.29
18	1.1	300	.89	.10	300	.08	.19	220	.11
19	1.2	350	1.1	.10	150	.04	.14	200	.08
20	2.1	400	2.3	.07	80	.02	.03	180	.01
21	2.9	380	3.0	.07	50	.00	.03	163	.01
22	2.0	360	1.9	.07	30	.00	.03	40	.00
23	2.0	346	1.9	.03	15	.00	.00	0	.00
24	1.8	330	1.6	.00	0	.00	.00	0	.00
25	1.4	320	1.2	.00	0	.00	.03	50	.00
26	1.2	300	.97	.00	0	.00	.07	300	.06
27	1.2	290	.94	.03	5	.00	.07	250	.05
28	.98	280	.74	.07	10	.00	.03	223	.02
29	.85	270	.62	.16	20	.00	.00	0	.00
30	.79	270	.58	21	898	51	.00	0	.00
31	---	---	---	5.8	770	12	---	---	---
TOTAL	72.20	---	66.69	34.54	---	69.71	91.73	---	200.99

## BAD RIVER BASIN

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06441500 BAD RIVER NEAR FORT PIERRE, SD--Continued

SUSPENDED-SEDIMENT DISCHARGE, IN TONS PER DAY, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
	JULY			AUGUST			SEPTEMBER		
1	.00	0	.00	.00	0	.00	.00	0	.00
2	.00	0	.00	.00	0	.00	.00	0	.00
3	.00	0	.00	.00	0	.00	.00	0	.00
4	.00	0	.00	.00	0	.00	.00	0	.00
5	.00	0	.00	.00	0	.00	.00	0	.00
6	.00	0	.00	.00	0	.00	.00	0	.00
7	.00	0	.00	.00	0	.00	.00	0	.00
8	.00	0	.00	.00	0	.00	.00	0	.00
9	.00	0	.00	.00	0	.00	.00	0	.00
10	.00	0	.00	.00	0	.00	.00	0	.00
11	.00	0	.00	.00	0	.00	.00	0	.00
12	.00	0	.00	.00	0	.00	.00	0	.00
13	.00	0	.00	.00	0	.00	.00	0	.00
14	.00	0	.00	.00	0	.00	.00	0	.00
15	.00	0	.00	.00	0	.00	.00	0	.00
16	.00	0	.00	.00	0	.00	.00	0	.00
17	.00	0	.00	.00	0	.00	.00	0	.00
18	.00	0	.00	.00	0	.00	.00	0	.00
19	.00	0	.00	.00	0	.00	.00	0	.00
20	.00	0	.00	.00	0	.00	.00	0	.00
21	.00	0	.00	.00	0	.00	.00	0	.00
22	.00	0	.00	.00	0	.00	.00	0	.00
23	1.4	84	.32	6.1	232	3.8	.00	0	.00
24	7.5	535	11	.07	100	.02	.00	0	.00
25	2.8	260	2.0	.00	0	.00	.00	0	.00
26	.85	140	.32	.00	0	.00	.00	0	.00
27	.31	65	.05	.00	0	.00	.00	0	.00
28	.19	15	.00	.00	0	.00	.00	0	.00
29	.00	0	.00	.00	0	.00	.00	0	.00
30	.00	0	.00	.00	0	.00	.00	0	.00
31	.00	0	.00	.00	0	.00	---	---	---
TOTAL	13.05	---	13.69	6.17	---	3.82	0.00	---	0.00

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (00061)	TEMPER- ATURE (DEG C) (00010)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)
FEB								
22...	1000	--	--	--	75	87	98	100
MAR								
15...	1015	--	1.0	100	70	80	95	--

## MEDICINE KNOLL CREEK BASIN

06442000 MEDICINE KNOLL CREEK NEAR BLUNT, SD

LOCATION.--Lat 44°33'46", long 99°54'50", in NW¼ sec.31, T.113 N., R.75 W., Sully County, Hydrologic Unit 10140103, on left bank at downstream side of highway bridge, 4.8 mi northeast of Blunt, and 5.5 mi upstream from South Fork Medicine Knoll Creek.

DRAINAGE AREA.--317 mi².

PERIOD OF RECORD.--March 1950 to current year. Prior to October 1959, published as Medicine Creek near Blunt.

REVISED RECORDS.--WDR SD-76-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,611.08 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 31, 1950, nonrecording gage at same site and datum.

REMARKS.--Records poor. Only daily discharges above 25 ft³/s are being published.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,830 ft³/s Apr. 5, 1952 (gage height, 12.34 ft), from floodmarks; maximum gage height, 13.2 ft between Mar. 26-29, 1959, from floodmarks (backwater from ice); no flow for long periods in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft³/s and maximum (\*):

Date	Time	Discharge (ft³/s)	Gage height (ft)	Date	Time	Discharge (ft³/s)	Gage height (ft)
a	--	*0.70	unknown				

a Sometime during period Mar. 18-29.

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

Daily discharge, in cubic feet per second, above 25 ft³/s are given herewith:

No daily flow above 25 ft³/s during year

MEDICINE CREEK BASIN

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06442500 MEDICINE CREEK AT KENNEBEC, SD

LOCATION.--Lat 43°54'17", long 99°52'35", in NW¼NE¼ sec.18, T.105 N., R.75 W., Lyman County, Hydrologic Unit 10140104, on right bank 4 ft downstream from highway bridge, 0.5 mi west of Kennebec, and 0.5 mi downstream from small right-bank tributary.

DRAINAGE AREA.--465 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1954 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,659.64 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 28, 1954, nonrecording gage at same site and datum.

REMARKS.--Records fair. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--31 years, 16.3 ft<sup>3</sup>/s (11,810 acre-ft/yr); median of yearly mean discharges, 7.9 ft<sup>3</sup>/s (5,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,970 ft<sup>3</sup>/s Mar. 28, 1960 (gage height, 16.71 ft); no flow for many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1952 reached a stage of 17.0 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 18	unknown	*3,440	*13.90	July 18	0045	151	4.27

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	14	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	12	12	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	35	9.0	.00	.00	.00	.00	20
4	.00	.00	.00	.00	.00	40	6.0	.00	.00	.00	.00	2.7
5	.00	.00	.00	.00	.00	35	4.0	.00	3.6	.00	.00	.44
6	.00	.00	.00	.00	.00	35	3.0	.00	1.3	.00	.00	.04
7	.00	.00	.00	.00	.00	40	2.0	.00	.07	.00	.00	.00
8	.00	.00	.00	.00	.00	45	1.0	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	50	.70	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	50	.40	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	50	.20	.00	1.3	.00	.00	.01
12	.00	.00	.00	.00	.00	55	.10	.00	3.8	.00	.00	.76
13	.00	.00	.00	.00	.00	55	.05	.00	1.6	.00	.00	2.5
14	.00	.00	.00	.00	.00	60	.00	.00	.70	.00	.00	2.0
15	.00	.00	.00	.00	.00	300	.00	.00	.52	.00	.00	1.6
16	.00	.00	.00	.00	.00	1000	.00	.00	.18	.00	.00	1.6
17	.00	.00	.00	.00	.00	1600	.00	.00	.02	5.2	.00	1.6
18	.00	.00	.00	.00	.00	1800	.00	.00	.00	46	.00	1.5
19	.00	.00	.00	.00	.00	615	.05	.00	.00	9.3	.00	1.3
20	.00	.00	.00	.00	.00	298	.11	.00	.00	2.2	.00	1.0
21	.00	.00	.00	.00	.00	199	.00	.00	.00	.52	.00	.83
22	.00	.00	.00	.00	.00	129	.00	.00	.00	.02	.00	.62
23	.00	.00	.00	.00	.00	100	.00	.00	.00	.00	.00	.44
24	.00	.00	.00	.00	.00	83	.00	.00	.00	.00	.00	.31
25	.00	.00	.00	.00	.00	61	.00	.00	.00	.00	.00	.20
26	.00	.00	.00	.00	.00	45	.00	.00	.00	.00	.00	.11
27	.00	.00	.00	.00	.00	36	.00	.00	.00	.00	.00	.01
28	.00	.00	.00	.00	.00	29	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	24	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	21	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	17	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	6919.00	52.61	.00	13.09	63.24	.00	39.57
MEAN	.00	.00	.00	.00	.00	223	1.75	.00	.44	2.04	.00	1.32
MAX	.00	.00	.00	.00	.00	1800	14	.00	3.8	46	.00	20
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	.00	13720	104	.00	26	125	.00	78
CAL YR 1984	TOTAL	4426.20		MEAN	12.1	MAX	1460	MIN	.00	AC-FT	8780	
WTR YR 1985	TOTAL	7087.51		MEAN	19.4	MAX	1800	MIN	.00	AC-FT	14060	



## MISSOURI RIVER MAIN STEM

06442700 LAKE SHARPE NEAR FORT THOMPSON, SD

LOCATION.--Lat 44°02'18", long 99°26'45", in SE¼ sec.27, T.107 N., R.72 W., Lyman County, Hydrologic Unit 10140101, at left approach wall of powerhouse at Big Bend Dam on Missouri River, 2.5 mi south of Fort Thompson, and at mile 987.4.

DRAINAGE AREA.--249,300 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1963 to current year (monthend contents only).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earthfill dam; closure made July 1963; intentional storage began November 1963. Maximum capacity, 1,874,000 acre-ft below elevation, 1,423.0 ft (top of spillway gates). Normal maximum, 1,697,000 acre-ft below elevation 1,424.0 ft. Inactive storage, 1,424,000 acre-ft below elevation 1,415.0 ft. Figures given herein represent elevations at powerhouse and total contents adjusted for wind effect.

The spillway consists of a concrete chute with flat crest at elevation 1,385.0 ft surmounted by 8 taintor gates, each 40 by 38 ft; design capacity, 390,000 ft<sup>3</sup>/s. Normal releases are through 8 power units (completed in July 1966), with a generating capacity of 58,500 kilowatts each. Maximum release through powerplant about 100,000 ft<sup>3</sup>/s. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Records of elevation and contents provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,829,000 acre-ft Apr. 22, 1971, affected by wind; minimum since initial filling, 1,448,000 acre-ft Sept. 17, 1967, affected by wind.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,778,000 acre-ft Oct. 14; minimum contents, 1,564,000 acre-ft Apr. 1.

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	1,421.00	1,757,000	-
Oct. 31 . . . . .	1,420.72	1,722,000	-35,000
Nov. 30 . . . . .	1,420.18	1,707,000	-15,000
Dec. 31 . . . . .	1,420.80	1,743,000	+36,000
CAL YR 1984 . . . . .	-	-	-17,000
Jan. 31 . . . . .	1,420.28	1,716,000	-27,000
Feb. 28 . . . . .	1,420.23	1,717,000	+1,000
Mar. 31 . . . . .	1,417.77	1,573,000	-144,000
Apr. 30 . . . . .	1,420.71	1,742,000	+169,000
May 31 . . . . .	1,420.59	1,729,000	-13,000
June 30 . . . . .	1,420.98	1,749,000	+20,000
July 31 . . . . .	1,420.41	1,723,000	-26,000
Aug. 31 . . . . .	1,420.32	1,712,000	-11,000
Sept. 30 . . . . .	1,420.85	1,747,000	+35,000
WTR YR 1985 . . . . .	-	-	-10,000

NOTE.--Lake free of ice Apr. 3.

## WHITE RIVER BASIN

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06446000 WHITE RIVER NEAR OGLALA, SD

LOCATION.--Lat 43°15'17", long 102°49'24", in SW¼NE¼ sec.24, T.38 N., R.47 W., Shannon County, Hydrologic Unit 10140201, on right bank at downstream side of bridge, 3.0 mi downstream from Blacktail Creek, and 7.0 mi northwest of Oglala.

DRAINAGE AREA.--2,200 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--May 1943 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,853.54 ft above National Geodetic Vertical Datum of 1929. Prior to May 6, 1947, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period and/or no gage-height record, Dec. 11 to Mar. 21, which are poor. Some diversions for irrigation upstream from station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--42 years, 52.1 ft<sup>3</sup>/s (37,750 acre-ft/yr); median of yearly mean discharges, 45 ft<sup>3</sup>/s (32,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,200 ft<sup>3</sup>/s June 21, 1947 (gage height, 23.50 ft), from rating curve extended above 2,800 ft<sup>3</sup>/s on basis of velocity-area studies; maximum gage height, 23.61 ft June 16, 1967; no flow at times in 1952, 1954, 1957, 1961, 1964, 1965, 1970-76, 1981, 1982, 1984, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 18	0700	ice jam	*7.54	Mar. 23	0715	*120	6.85

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	14	9.2	7.6	6.6	47	29	19	12	.03	.00	.00
2	4.4	10	9.2	7.8	6.8	45	38	19	8.9	.02	.00	.00
3	3.6	7.3	9.2	8.0	7.0	44	37	18	8.4	.00	.00	.00
4	4.7	5.4	9.3	8.2	7.2	42	36	16	12	.00	.00	.00
5	4.9	4.4	9.3	8.2	7.2	40	39	15	12	.00	.00	.00
6	5.2	4.1	9.6	8.4	7.4	50	41	12	11	.00	.00	.00
7	4.6	3.6	9.6	8.4	7.4	56	40	12	11	.00	2.0	.00
8	8.6	2.9	9.8	8.2	7.6	62	37	9.4	11	.00	8.8	.00
9	4.6	2.4	9.8	8.0	7.6	68	36	10	11	.00	6.4	.00
10	4.0	3.1	10	7.8	7.6	70	35	9.6	10	.00	4.5	.00
11	3.0	4.8	9.8	7.6	7.8	67	35	8.8	11	.00	1.5	.00
12	4.3	6.1	9.0	7.6	8.4	68	35	7.4	9.6	.00	.00	.00
13	5.5	5.6	9.0	8.0	9.4	69	34	12	8.8	.00	.00	.00
14	3.4	6.0	8.7	8.0	9.7	74	28	12	8.9	.00	.00	.00
15	5.7	6.3	9.2	8.2	12	77	27	14	7.9	.00	5.0	.00
16	4.4	7.5	9.0	8.4	13	81	27	13	7.0	.00	2.0	.00
17	4.6	7.3	8.6	8.4	14	84	26	18	4.8	.00	1.0	.00
18	3.1	6.5	8.0	8.4	14	86	27	17	4.2	.00	.50	.00
19	2.6	9.9	8.0	8.0	15	87	33	16	4.3	.00	1.0	.00
20	1.9	7.7	8.2	7.6	16	90	25	16	2.4	.00	6.5	.00
21	2.1	7.4	7.8	7.7	19	92	20	12	2.1	.00	1.5	.00
22	.71	7.5	7.8	8.0	21	94	20	12	1.5	.00	.50	.00
23	.25	9.5	7.8	8.2	23	90	18	13	1.2	.00	.10	.00
24	.07	9.5	7.6	8.4	25	70	17	15	.80	.00	.00	.00
25	.04	9.0	7.4	8.2	29	63	16	15	.60	.00	.00	.00
26	.00	9.0	7.8	8.0	33	54	15	12	.50	.00	.00	.00
27	.00	9.0	8.0	7.8	38	46	15	13	.40	.00	.00	.00
28	7.2	9.0	7.8	7.8	50	44	15	12	.30	.00	.00	.00
29	9.8	9.6	7.6	7.6	---	34	14	12	.20	.00	.00	.00
30	14	9.4	7.6	7.4	---	37	18	12	.10	.00	.00	.00
31	15	---	7.4	6.4	---	31	---	12	---	.00	.00	---
TOTAL	135.77	213.8	267.1	246.3	429.7	1962	833	414.2	183.90	.05	41.30	.00
MEAN	4.38	7.13	8.62	7.95	15.3	63.3	27.8	13.4	6.13	.00	1.33	.00
MAX	15	14	10	8.4	50	94	41	19	12	.03	8.8	.00
MIN	.00	2.4	7.4	6.4	6.6	31	14	7.4	.10	.00	.00	.00
AC-FT	26	424	530	489	852	3890	1650	822	365	.1	82	.00
CAL YR 1984	TOTAL	17080.06		MEAN	46.7	MAX	491	MIN	.00	AC-FT	33880	
WTR YR 1985	TOTAL	4727.12		MEAN	13.0	MAX	94	MIN	.00	AC-FT	9380	

## WHITE RIVER BASIN

06447000 WHITE RIVER NEAR KADOKA, SD

LOCATION.--Lat 43°45'09", long 101°31'28", in SE¼SE¼ sec.30, T.3 S., R.22 E., Black Hills meridian, Jackson County, Hydrologic Unit 10140202, near center of span on downstream side of bridge on State Highway 73, 5.0 mi upstream from Pass Creek, 5.5 mi downstream from Cottonwood Creek, and 5.8 mi south of Kadoka.

DRAINAGE AREA.--5,000 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1942 to current year.

REVISED RECORDS.--WSP 1279: 1944(M), 1948.

GAGE.--Water-stage recorder. Datum of gage is 2,122.18 ft above National Geodetic Vertical Datum of 1929. Prior to June 14, 1949, nonrecording gage, and June 14, 1949, to Mar. 8, 1955, water-stage recorder at site 0.3 mi downstream at same datum. Mar. 9, 1955, to May 17, 1957, nonrecording gage at present site and datum.

REMARKS.--Records fair except those for winter period, Nov. 6 to Mar. 10, which are poor. Some diversions above station for irrigation. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--43 years, 272 ft<sup>3</sup>/s (197,100 acre-ft/yr); median of yearly mean discharges, 250 ft<sup>3</sup>/s (181,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,700 ft<sup>3</sup>/s June 7, 1951 (gage height, 13.83 ft), site then in use, from rating curve extended above 16,000 ft<sup>3</sup>/s; maximum gage height, 16.18 ft May 20, 1982; no flow at times in many years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 4, 1942, reached a stage of 16.24 ft, from floodmarks (discharge, about 32,000 ft<sup>3</sup>/s, from rating curve extended above 16,000 ft<sup>3</sup>/s). Floods of Mar. 8, 1905, and in spring of 1927 were 1 or 2 ft higher than flood of June 4, 1942, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 9	unknown	a*2,500	a*9.01				
a Backwater from ice.							
No flow July 15-17.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	18	12	9.5	8.0	95	84	56	29	20	443	75
2	6.6	21	12	10	8.5	95	64	53	27	32	135	60
3	3.1	17	12	10	8.5	90	73	44	29	78	34	41
4	7.2	17	12	11	8.5	90	66	38	165	35	17	34
5	7.8	17	11	11	8.5	80	86	38	127	231	19	30
6	7.8	16	11	12	9.0	85	90	38	75	46	20	25
7	7.8	16	11	11	9.0	200	92	34	71	12	5.7	24
8	7.8	16	12	11	9.0	400	94	30	71	2.2	117	22
9	7.8	15	12	10	9.5	1000	80	27	75	2.6	48	124
10	7.2	15	12	10	9.5	2200	76	15	242	2.2	30	236
11	8.5	14	12	9.5	10	2340	78	19	602	1.1	24	189
12	15	14	11	9.5	11	2010	78	22	540	.56	17	276
13	17	12	11	10	12	1730	73	24	127	.28	17	172
14	16	12	11	11	14	1890	66	13	70	.14	24	105
15	15	11	11	10	15	1690	60	21	59	.00	17	70
16	12	11	11	10	16	1240	53	20	57	.00	11	44
17	15	10	10	9.5	16	900	47	20	56	.00	17	42
18	15	11	10	10	18	642	53	18	34	89	16	29
19	20	11	11	10	24	518	51	17	37	53	17	31
20	20	11	12	11	50	416	68	15	31	29	147	18
21	20	11	12	10	90	354	92	15	20	19	1340	18
22	20	12	11	10	100	307	117	15	17	12	500	10
23	20	12	11	10	95	227	130	11	6.6	10	219	4.9
24	20	13	10	11	95	240	103	6.6	1.6	10	44	7.2
25	27	14	10	11	100	219	80	6.6	2.2	15	31	3.0
26	18	13	11	11	100	127	62	9.0	10	40	53	2.0
27	18	13	11	11	95	130	60	8.0	7.8	27	44	1.0
28	20	12	11	10	90	115	56	6.6	13	15	38	.70
29	22	12	10	10	---	103	53	13	17	7.8	34	.40
30	15	12	10	9.5	---	94	56	38	20	364	34	28
31	15	---	9.5	9.0	---	89	---	29	---	661	86	---
TOTAL	436.5	409	343.5	318.5	1039.0	19716	2241	719.8	2639.2	1814.88	3598.7	1722.20
MEAN	14.1	13.6	11.1	10.3	37.1	636	74.7	23.2	88.0	58.5	116	57.4
MAX	27	21	12	12	100	2340	130	56	602	661	1340	276
MIN	3.1	10	9.5	9.0	8.0	80	47	6.6	1.6	.00	5.7	.40
AC-FT	86	811	681	632	2060	39110	4450	1430	5230	3600	7140	3420
CAL YR 1984	TOTAL	74360.34		MEAN	203	MAX	3040	MIN	.00	AC-FT	147500	
WTR YR 1985	TOTAL	34998.28		MEAN	95.9	MAX	2340	MIN	.00	AC-FT	69420	

## 06447500 LITTLE WHITE RIVER NEAR MARTIN, SD

LOCATION.--Lat 43°10'00", long 101°37'47", in NW¼ sec.19, T.37 N., R.36 W., Bennett County, Hydrologic Unit 10140203, on right bank 70 ft downstream from highway culvert and 5.4 mi east of Martin.

DRAINAGE AREA.--310 mi<sup>2</sup>, approximately, of which about 230 mi<sup>2</sup> probably contributes directly to surface runoff.

PERIOD OF RECORD.--February 1938 to September 1940, July 1962 to current year. Prior to October 1965, published as South Fork White River near Martin.

GAGE.--Water-stage recorder. Elevation of gage is 3,045 ft, by barometer. Prior to Aug. 14, 1938, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Nov. 29 to Mar. 17, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--25 years, 19.0 ft<sup>3</sup>/s (13,770 acre-ft/yr); median of yearly mean discharges, 18 ft<sup>3</sup>/s (13,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,190 ft<sup>3</sup>/s July 19, 1965 (gage height, 12.90 ft), from rating curve extended above 340 ft<sup>3</sup>/s on basis of computation of peak flow through culvert and flow-over-road measurement of peak flow; maximum gage height, 13.21 ft Mar. 11, 1966 (backwater from ice); minimum daily discharge, 0.6 ft<sup>3</sup>/s Aug. 14, 16, 18, 1940; no flow for part of each day Oct. 19, 20, 22, 1962 (regulation caused by construction work above station).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 5, 1932, reached a stage of 13.3 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
July 4	unknown	*123	*4.90	No other peak greater than base discharge.			

Minimum daily discharge, 5.4 ft<sup>3</sup>/s Aug. 8, 9, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.6	14	17	6.0	5.6	8.6	26	20	9.9	8.8	6.7	8.9
2	9.9	14	15	6.0	5.8	8.4	26	18	9.3	8.7	7.1	8.8
3	9.9	14	14	6.5	6.0	8.2	26	17	8.9	8.3	7.4	8.8
4	9.9	14	14	6.7	6.2	8.0	26	16	9.0	69	7.2	8.8
5	9.9	15	13	7.0	6.2	7.8	27	15	9.1	90	6.8	8.8
6	11	14	12	7.5	6.4	8.0	31	14	9.4	46	6.1	8.8
7	11	14	13	7.5	6.4	8.4	33	14	9.2	30	5.7	8.8
8	12	14	15	7.0	6.6	9.0	33	14	8.7	24	5.4	9.2
9	12	16	15	6.5	6.8	10	29	13	8.2	18	5.4	10
10	12	15	14	6.5	7.0	15	26	13	8.0	16	5.5	10
11	12	16	14	6.0	6.6	16	25	13	7.9	13	5.4	11
12	12	18	13	6.0	6.8	15	24	12	7.8	12	5.5	12
13	12	20	12	6.5	7.0	14	23	12	7.7	11	5.5	13
14	12	21	11	7.0	7.0	16	23	12	7.9	9.9	5.7	13
15	11	22	10	8.0	7.2	20	23	12	8.1	9.2	5.8	12
16	11	18	9.5	8.5	7.4	30	22	12	8.3	9.2	6.0	12
17	11	17	9.0	9.0	7.6	45	21	11	7.8	9.0	6.5	12
18	12	18	8.0	9.0	7.8	60	20	11	7.5	9.0	7.1	11
19	12	20	8.0	8.5	7.9	62	20	11	7.2	8.6	7.5	11
20	12	19	8.5	8.5	8.0	52	20	10	7.2	8.1	8.0	10
21	12	21	8.5	9.2	8.2	47	21	10	7.2	7.8	8.2	10
22	13	21	8.5	8.8	8.2	40	24	9.9	7.3	7.6	8.4	9.9
23	13	22	8.0	8.6	8.4	34	25	9.5	7.3	7.4	8.7	9.7
24	13	19	7.0	8.4	8.4	33	23	9.2	7.4	7.4	8.6	10
25	13	19	6.5	8.0	8.6	31	21	9.0	7.4	7.3	8.4	10
26	13	21	7.0	7.6	8.6	30	20	8.7	7.6	7.0	8.4	11
27	13	19	7.0	7.2	8.8	29	20	8.7	7.9	6.6	8.4	11
28	13	19	7.5	7.0	8.8	28	22	10	8.3	6.3	8.4	11
29	13	19	7.0	6.6	---	28	23	16	8.4	6.1	8.5	11
30	13	18	6.5	6.2	---	28	21	12	8.8	6.2	8.6	12
31	13	---	6.0	5.5	---	26	---	11	---	6.4	8.7	---
TOTAL	366.2	531	324.5	227.3	204.3	775.4	724	384.0	244.7	493.9	219.6	313.5
MEAN	11.8	17.7	10.5	7.33	7.30	25.0	24.1	12.4	8.16	15.9	7.08	10.4
MAX	13	22	17	9.2	8.8	62	33	20	9.9	90	8.7	13
MIN	9.6	14	6.0	5.5	5.6	7.8	20	8.7	7.2	6.1	5.4	8.8
AC-FT	72	1050	644	451	405	1540	1440	762	485	980	436	622
CAL YR 1984	TOTAL	6559.4		MEAN	17.9	MAX	64	MIN	4.6	AC-FT	13010	
WTR YR 1985	TOTAL	4808.4		MEAN	13.2	MAX	90	MIN	5.4	AC-FT	9540	



## WHITE RIVER BASIN

## 06449000 LAKE CREEK BELOW REFUGE, NEAR TUTHILL, SD

LOCATION.--Lat 43°08'46", long 101°30'38", in SW $\frac{1}{4}$  sec.30, T.37 N., R.35 W., Bennett County, Hydrologic Unit 10140203, on left bank 400 ft downstream from east boundary of LaCreek game refuge, 1.2 mi southwest of Tuthill, and 5.5 mi upstream from mouth.

DRAINAGE AREA.--120 mi<sup>2</sup>, approximately, of which about 60 mi<sup>2</sup> probably contributes directly to surface runoff.

PERIOD OF RECORD.--February 1938 to September 1940, July 1962 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 3,055 ft, by barometer. Prior to Aug. 4, 1938, nonrecording gage at same site and datum.

REMARKS.--Records fair. Flow regulated by series of dams above gage. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--25 years, 15.6 ft<sup>3</sup>/s (11,300 acre-ft/yr); median of yearly mean discharges, 16 ft<sup>3</sup>/s (11,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 178 ft<sup>3</sup>/s June 18, 1967 (gage height, 5.17 ft); maximum gage height, 5.67 ft Mar. 28, 1975 (backwater from ice); no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 43 ft<sup>3</sup>/s at 1415 hours, Mar. 28 (gage height, 2.78 ft); no flow June 9-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	.27	6.6	10	11	17	9.4	18	1.4	2.2	1.1	.33
2	.83	.20	7.5	20	11	18	11	18	1.0	2.3	1.1	.32
3	.83	.15	6.1	26	12	20	7.8	19	.80	2.8	.84	.31
4	.73	.10	5.3	26	12	21	14	17	.50	2.2	.64	.30
5	.62	.07	5.9	26	13	20	16	14	.30	2.2	.61	.30
6	.50	.03	5.4	27	13	20	17	12	.15	2.3	.52	.29
7	.40	.01	5.2	27	13	20	15	11	.05	5.0	.47	.30
8	.30	.95	5.3	27	12	20	13	13	.01	3.8	.25	.30
9	.20	.83	5.5	29	11	20	15	13	.00	2.8	.23	.35
10	3.0	.70	6.5	27	10	20	16	13	.00	1.6	.20	.50
11	1.2	.52	7.0	24	9.7	21	19	18	.00	1.3	.18	4.7
12	.48	.40	6.5	22	9.5	21	22	15	1.4	1.7	.15	8.1
13	.32	.30	6.5	21	9.5	22	18	13	3.0	1.2	.28	6.5
14	.12	.25	6.0	18	9.3	21	19	12	3.0	1.2	.28	6.8
15	.53	.20	6.0	17	9.3	18	19	12	3.0	1.2	.26	6.6
16	.70	.15	6.0	17	8.7	16	18	8.9	3.0	1.1	.23	6.3
17	.55	.10	5.5	16	9.1	17	25	8.2	2.7	1.8	.22	4.5
18	.36	.06	5.5	14	9.1	18	20	8.3	2.0	1.3	.50	4.4
19	.80	.06	5.5	14	8.9	19	21	7.8	1.6	1.0	.70	4.3
20	.84	.05	5.5	13	9.6	20	22	7.2	1.7	.98	.90	4.0
21	.65	1.9	5.0	12	9.9	21	22	6.8	1.7	.93	.85	4.0
22	.80	3.4	5.0	11	10	22	21	5.8	7.0	.92	.75	3.8
23	1.1	11	5.0	11	10	19	21	4.0	1.8	.95	.65	3.3
24	.91	11	5.0	11	12	16	23	3.4	1.9	1.9	.55	3.1
25	.72	10	5.0	10	13	16	23	3.7	1.9	2.9	.50	2.7
26	.43	9.5	4.5	10	14	15	18	1.9	1.9	2.8	.45	2.7
27	.27	9.0	4.5	10	15	13	23	1.9	1.9	2.2	.45	2.9
28	.15	8.1	4.5	9.9	16	23	21	2.1	3.4	1.6	.40	3.0
29	.11	6.0	4.5	9.6	---	7.3	20	1.9	3.3	1.3	.40	3.1
30	.95	6.0	5.0	11	---	7.2	18	1.8	2.3	1.2	.35	2.9
31	.63	---	5.0	10	---	8.2	---	1.6	---	1.1	.35	---
TOTAL	20.86	81.30	172.3	536.5	310.6	556.7	540.2	293.3	52.71	57.78	15.36	91.00
MEAN	.67	2.71	5.56	17.3	11.1	18.0	18.0	9.46	1.76	1.86	.50	3.03
MAX	3.0	11	7.5	29	16	23	25	19	7.0	5.0	1.1	8.1
MIN	.11	.01	4.5	9.6	8.7	7.2	7.8	1.6	.00	.92	.15	.29
AC-FT	4	161	342	1060	616	1100	1070	582	105	115	30	180
CAL YR 1984	TOTAL	4951.61		MEAN	13.5	MAX	87	MIN	.01	AC-FT	9820	
WTR YR 1985	TOTAL	2728.61		MEAN	7.48	MAX	29	MIN	.00	AC-FT	5410	

## 06449100 LITTLE WHITE RIVER NEAR VETAL, SD

LOCATION.--Lat 43°06'03", long 101°13'49", in NE¼NW¼ sec.17, T.36 N., R.33 W., Bennett County, Hydrologic Unit 10140203, on left bank 120 ft downstream from highway bridge, 0.3 mi downstream from small right-bank tributary, 10.8 mi southeast of Vetal, and 15.3 mi upstream from Spring Creek.

DRAINAGE AREA.--590 mi<sup>2</sup>, approximately, of which about 415 mi<sup>2</sup> probably contributes directly to surface runoff.

PERIOD OF RECORD.--August 1959 to current year. Prior to October 1965, published as South Fork White River near Vetal.

GAGE.--Water-stage recorder. Datum of gage is 2,780.69 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 14, 1959, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Nov. 26 to Feb. 19, which are poor. Some small diversion for irrigation and some storage in several small lakes above station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--26 years, 52.5 ft<sup>3</sup>/s (38,040 acre-ft/yr); median of yearly mean discharges, 53 ft<sup>3</sup>/s (38,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,330 ft<sup>3</sup>/s Mar. 13, 1966 (gage height, 7.75 ft); minimum daily, 9.0 ft<sup>3</sup>/s Dec. 24, 25, 1974.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 5	1400	ice jam	*4.72	Mar. 6	1345	*104	4.45

Minimum daily discharge, 15 ft<sup>3</sup>/s July 4-6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	31	30	27	21	47	55	66	22	17	21	17
2	23	31	30	28	21	50	57	66	20	17	20	18
3	22	32	28	30	22	59	60	57	20	16	19	17
4	21	31	28	30	22	65	61	55	21	15	19	17
5	21	30	26	31	22	65	61	53	20	15	20	16
6	20	30	25	32	23	70	61	48	20	15	20	16
7	20	30	30	30	24	79	62	47	20	21	20	16
8	21	30	40	30	25	69	62	51	20	30	20	19
9	21	34	39	28	25	69	68	49	20	33	20	18
10	21	31	37	26	26	64	68	48	21	31	21	17
11	22	32	37	25	27	61	69	48	22	28	20	19
12	25	33	33	27	29	59	67	48	23	26	24	22
13	25	32	30	29	30	56	66	48	23	24	21	21
14	24	30	30	30	30	65	66	45	23	22	20	23
15	24	29	29	30	30	77	64	42	23	21	21	23
16	24	30	28	30	31	71	64	41	22	20	21	23
17	25	30	28	31	31	68	65	37	22	19	20	23
18	26	30	28	30	31	71	67	35	22	17	20	23
19	26	32	29	26	32	73	64	34	21	17	20	23
20	26	30	30	24	33	77	65	33	20	20	29	23
21	25	32	30	26	33	79	69	32	19	19	23	23
22	26	32	30	28	32	82	65	31	18	17	21	24
23	28	33	29	29	28	82	64	30	17	17	23	24
24	29	38	27	29	26	79	63	28	19	18	21	24
25	29	42	27	30	27	75	65	26	19	16	21	24
26	30	39	28	29	27	73	65	25	20	16	21	24
27	30	33	30	29	29	68	66	25	19	17	21	23
28	30	30	31	28	39	64	71	24	18	18	22	24
29	30	30	30	28	---	63	70	24	17	19	36	25
30	30	32	29	25	---	56	68	23	17	25	24	25
31	30	---	27	20	---	56	---	20	---	22	19	---
TOTAL	776	959	933	875	776	2092	1938	1239	608	628	668	634
MEAN	25.0	32.0	30.1	28.2	27.7	67.5	64.6	40.0	20.3	20.3	21.5	21.1
MAX	30	42	40	32	39	82	71	66	23	33	36	25
MIN	20	29	25	20	21	47	55	20	17	15	19	16
AC-FT	154	1900	1850	1740	1540	4150	3840	2460	1210	1250	1320	1260
CAL YR 1984	TOTAL	19572	MEAN	53.5	MAX	143	MIN	13	AC-FT	38820		
WTR YR 1985	TOTAL	12126	MEAN	33.2	MAX	82	MIN	15	AC-FT	24050		

## WHITE RIVER BASIN

06449300 LITTLE WHITE RIVER ABOVE ROSEBUD, SD

LOCATION.--Lat 43°15'47", long 100°55'02", in NW¼SE¼ sec.18, T.38 N., R.30 W., Todd County, Hydrologic Unit 10140203, on right bank at downstream side of Lampert bridge on BIA highway in Crazy Horse Canyon, at Ghost Hawk Park, 3.1 mi upstream from Rosebud Creek, and 4.6 mi northwest of Rosebud.

DRAINAGE AREA.--890 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,415 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair except those for winter periods, Nov. 13-18 and Nov. 21 to Mar. 18, which are poor. Some small diversions for irrigation and some storage in several small lakes above station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 900 ft<sup>3</sup>/s Aug. 4, 1983 (gage height, 3.51 ft); minimum daily, 30 ft<sup>3</sup>/s Spt. 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 8	1615	ice jam	a*3.72	July 2	0730	*204	1.63

a Maximum gage height observed.

Minimum daily discharge, 35 ft<sup>3</sup>/s June 24 and July 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49	65	55	58	54	80	130	127	52	50	77	54
2	54	70	50	60	54	80	130	126	55	80	70	54
3	52	70	48	65	54	78	125	131	55	42	64	57
4	56	76	48	70	56	70	130	116	65	45	54	52
5	55	80	48	75	56	65	135	115	59	40	50	48
6	50	70	50	80	58	65	135	111	61	40	56	46
7	52	75	55	77	60	80	130	100	59	38	60	45
8	50	80	62	73	62	90	130	100	57	38	51	50
9	58	80	60	68	62	100	135	96	47	44	53	58
10	67	85	60	65	64	105	130	98	50	56	46	58
11	69	74	58	62	64	100	135	106	52	56	46	65
12	75	81	56	65	66	95	145	85	53	54	61	61
13	77	80	54	70	68	95	140	97	55	50	61	56
14	74	75	52	73	68	105	135	73	54	43	51	56
15	66	72	54	73	70	120	126	89	49	49	52	56
16	63	72	53	72	74	130	132	87	55	52	58	56
17	64	75	53	72	78	130	131	88	45	50	52	56
18	74	72	53	67	78	140	124	88	37	44	45	54
19	65	70	51	63	80	155	134	82	42	44	43	56
20	68	66	53	62	83	160	105	79	46	49	79	56
21	72	66	56	66	83	156	95	78	45	53	87	54
22	76	64	60	73	78	169	104	75	42	52	61	56
23	78	66	58	73	78	160	100	71	36	44	60	58
24	84	70	58	70	78	160	130	69	35	85	58	61
25	80	72	56	68	80	150	126	69	49	62	57	60
26	92	70	58	68	78	150	103	79	62	51	56	60
27	110	60	62	68	78	150	100	84	54	35	54	65
28	82	55	67	67	78	140	122	73	52	53	56	60
29	86	55	67	65	---	140	154	70	52	64	56	58
30	92	57	64	61	---	140	149	64	50	113	72	63
31	68	---	60	52	---	130	---	52	---	97	58	---
TOTAL	2158	2123	1739	2101	1940	3688	3800	2778	1525	1673	1804	1689
MEAN	69.6	70.8	56.1	67.8	69.3	119	127	89.6	50.8	54.0	58.2	56.3
MAX	110	85	67	80	83	169	154	131	65	113	87	65
MIN	49	55	48	52	54	65	95	52	35	35	43	45
AC-FT	428	4210	3450	4170	3850	7320	7540	5510	3020	3320	3580	3350
CAL YR 1984	TOTAL	37386	MEAN	102	MAX	295	MIN	30	AC-FT	74160		
WTR YR 1985	TOTAL	27018	MEAN	74.0	MAX	169	MIN	35	AC-FT	53590		

## WHITE RIVER BASIN

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06449300 LITTLE WHITE RIVER ABOVE ROSEBUD, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1981 to current year.

REMARKS.--Monthly samples of common inorganic constituents collected.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
OCT 1984										
04...	08:50	58	281	7.9	16.0	12.5	9.0	706	9.6	97
31...	11:00	68	307	7.9	6.5	3.0	18	788	11.8	85
NOV										
20...	08:45	68	296	8.3	2.5	0.5	12	712	11.9	88
JAN 1985										
07...	11:30	77	307	7.9	1.5	0.5	14	710	14.2	106
22...	12:40	73	355	7.8	-4.0	0.0	13	710	13.2	97
FEB										
20...	15:55	83	270	8.0	4.0	0.0	9.2	694	13.5	102
MAR										
19...	08:05	152	280	7.8	7.0	5.0	36	740	--	--
APR										
18...	10:00	122	330	8.2	27.5	18.0	32	711	7.9	90
MAY										
15...	08:15	89	310	8.4	13.0	12.0	51	709	10.0	100
JUN										
13...	10:30	57	295	8.5	20.0	17.5	32	700	9.1	104
AUG										
08...	11:00	52	279	8.6	30.5	23.0	11	698	8.0	102
SEP										
12...	09:30	61	265	8.5	17.0	17.0	5.0	720	10.9	120

DATE	ALKA- LITY LAB (MG/L AS CACO3)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	BARIUM, DIS- SOLVED (UG/L AS BA)	LITHIUM DIS- SOLVED (UG/L AS LI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 1984										
04...	140	0.40	0.10	--	20	95	17	<1	210	11
31...	138	0.70	0.17	--	130	100	16	<1	200	11
NOV										
20...	132	0.80	0.15	--	40	100	15	<1	180	<3
JAN 1985										
07...	159	0.90	0.28	--	30	44	<4	1	87	22
22...	171	1.00	0.30	--	40	130	21	1	250	10
FEB										
20...	131	1.30	0.28	--	100	85	16	<1	180	150
MAR										
19...	131	0.40	0.38	--	120	30	10	<1	240	11
APR										
18...	141	0.40	0.28	--	300	63	50	<1	200	27
MAY										
15...	145	0.70	0.30	0.92	150	100	20	<1	210	8
JUN										
13...	65	0.70	0.19	0.58	--	110	17	<1	180	23
AUG										
08...	131	0.30	0.15	0.46	200	52	15	<1	170	21
SEP										
12...	123	0.40	0.09	0.28	50	89	14	<1	160	<3



## LITTLE WHITE RIVER BASIN

06449400 ROSEBUD CREEK AT ROSEBUD, SD

LOCATION.--Lat 43°14'14", long 100°51'26", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ NE $\frac{1}{4}$  sec.27, T.38 N., R.30 W., Todd County, Hydrologic Unit 10140203, on left bank 40 ft upstream from bridge on Spotted Tail Lane in town of Rosebud, 0.4 mi downstream from small right bank tributary, and 1.0 mi downstream from Spotted Tail Dam.

DRAINAGE AREA.--50.8 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,531.91 ft above National Geodetic Vertical Datum of 1929. October 1963 to September 1970, low-flow partial-record station 0.26 mi<sup>2</sup> upstream at different datum.

REMARKS.--Records fair. Flow regulated by Spotted Tail Dam and dam forming Indian Scout Lake, combined capacity, about 50 acre-ft, and some small diversions for irrigation of Spotted Tail Golf Course above station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--11 years, 7.31 ft<sup>3</sup>/s (5,300 acre-ft/yr); median of yearly mean discharges, 7.4 ft<sup>3</sup>/s (5,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 643 ft<sup>3</sup>/s July 27, 1976 (gage height, 10.34 ft); no flow Apr. 21, 1982.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25 ft<sup>3</sup>/s at 2345 hours, Apr. 3 (gage height, 5.25 ft); maximum gage height, 5.81 ft Jan. 12 (backwater from ice); minimum daily discharge, 3.0 ft<sup>3</sup>/s July 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	6.8	8.9	6.1	6.0	8.4	21	7.5	6.4	5.6	5.7	4.0
2	6.8	7.7	7.4	5.9	6.0	8.2	22	7.2	7.0	5.6	4.7	5.3
3	6.6	7.8	7.5	5.5	6.2	7.6	22	7.1	7.1	4.7	4.5	6.3
4	6.9	7.2	7.7	5.5	6.5	8.6	13	6.9	7.8	4.6	3.8	5.5
5	7.0	6.8	8.0	5.7	6.5	9.4	9.4	6.8	7.7	4.6	3.6	5.1
6	7.0	7.2	8.0	5.8	6.5	9.1	9.0	6.6	6.9	4.6	3.8	4.5
7	7.1	7.4	8.1	5.9	7.0	9.1	8.7	6.7	6.7	4.4	3.7	4.6
8	7.4	7.3	8.1	5.9	7.0	9.1	8.1	6.8	6.0	3.9	4.6	6.2
9	7.5	8.6	7.9	6.1	7.5	9.4	8.4	6.6	5.8	3.8	4.6	6.0
10	7.1	7.7	7.8	6.0	7.5	9.4	8.2	6.1	7.4	3.7	5.0	5.8
11	7.2	7.6	7.8	6.0	8.0	9.1	7.4	6.8	7.7	3.6	5.1	8.0
12	7.0	7.5	7.3	6.0	7.8	8.1	8.1	6.7	7.0	3.8	6.1	7.4
13	7.0	8.5	6.7	6.3	7.8	8.3	8.4	6.6	6.9	3.6	5.2	6.4
14	7.1	8.7	6.8	6.8	8.1	8.3	8.3	6.5	6.8	3.5	4.9	5.3
15	7.2	8.9	6.8	7.2	7.9	8.5	8.1	6.9	6.5	3.9	5.4	5.3
16	7.2	9.0	6.6	7.7	8.5	8.5	7.9	7.0	6.1	3.6	5.7	5.6
17	7.2	9.3	6.6	7.7	10	8.6	7.7	6.9	5.6	3.4	5.0	5.1
18	8.0	8.9	6.6	7.5	10	8.7	7.3	7.2	5.5	3.3	4.7	4.6
19	8.4	9.2	6.8	7.0	12	8.6	7.7	7.3	5.9	3.4	5.4	4.9
20	8.2	8.8	6.5	7.0	16	8.4	8.3	7.0	6.3	4.1	7.7	5.5
21	7.4	8.7	6.5	7.2	14	8.6	8.8	6.7	6.4	3.9	6.8	5.8
22	7.2	8.4	6.5	7.4	11	8.7	8.4	6.8	6.4	3.8	6.3	6.4
23	7.0	8.2	6.7	7.5	10	8.5	7.5	7.0	5.6	4.2	5.7	7.0
24	7.1	8.7	6.5	7.7	9.0	8.0	7.3	6.8	5.4	6.6	5.3	6.9
25	7.3	9.3	6.5	8.0	9.5	11	7.4	6.6	7.5	4.3	5.2	7.0
26	7.5	9.3	6.5	7.9	8.8	20	11	6.8	7.1	3.4	5.2	7.2
27	7.5	8.6	6.3	7.7	8.6	21	9.9	7.2	7.0	3.1	4.8	6.6
28	7.1	9.0	6.8	7.7	9.1	21	8.4	7.1	6.3	3.0	4.8	7.1
29	7.0	9.4	6.7	7.0	---	20	8.2	6.7	6.1	4.3	4.8	8.0
30	7.0	9.1	6.6	6.5	---	21	7.5	6.2	5.7	9.0	5.4	8.4
31	7.2	---	6.3	6.0	---	20	---	6.2	---	6.5	4.9	---
TOTAL	224.2	249.6	219.8	208.2	242.8	341.2	293.4	211.3	196.6	133.8	158.4	181.8
MEAN	7.23	8.32	7.09	6.72	8.67	11.0	9.78	6.82	6.55	4.32	5.11	6.06
MAX	8.4	9.4	8.9	8.0	16	21	22	7.5	7.8	9.0	7.7	8.4
MIN	6.6	6.8	6.3	5.5	6.0	7.6	7.3	6.1	5.4	3.0	3.6	4.0
AC-FT	44	495	436	413	482	677	582	419	390	265	314	361
CAL YR 1984	TOTAL	2772.2		MEAN	7.57	MAX	15	MIN	4.5	AC-FT	5500	
WTR YR 1985	TOTAL	2661.1		MEAN	7.29	MAX	22	MIN	3.0	AC-FT	5280	

## 06449500 LITTLE WHITE RIVER NEAR ROSEBUD, SD

LOCATION.--Lat 43°19'32", long 100°53'00", in SW¼NW¼ sec.28, T.39 N., R.30 W., Todd County, Hydrologic Unit 10140203, on left bank at downstream side of bridge on U.S. Highway 18, 0.3 mi downstream from Scabby Creek, 0.7 mi downstream from Soldier Creek, and 6.4 mi north of Rosebud.

DRAINAGE AREA.--1,020 mi<sup>2</sup>, approximately, of which about 760 mi<sup>2</sup> probably contributes directly to surface runoff.

PERIOD OF RECORD.--May 1943 to current year. Prior to October 1965, published as South Fork White River near Rosebud.

REVISED RECORDS.--WSP 1056: Drainage area. WSP 1309: 1946(M).

GAGE.--Water-stage recorder. Datum of gage is 2,294.99 ft above National Geodetic Vertical Datum of 1929. Prior to May 11, 1948, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Nov. 29 to Mar. 13, which are poor. Some small diversions for irrigation and some storage in several small lakes above station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--42 years, 110 ft<sup>3</sup>/s (79,700 acre-ft/yr); median of yearly mean discharges, 110 ft<sup>3</sup>/s (79,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,640 ft<sup>3</sup>/s June 11, 1967 (gage height, 14.09 ft), from rating curve extended above 1,300 ft<sup>3</sup>/s; minimum daily, 10 ft<sup>3</sup>/s Jan. 4, 1949, Feb. 20, 1955.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 330 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 6	1830	ice jam	*7.51	Mar. 23	1430	*181	4.74

Minimum daily discharge, 40 ft<sup>3</sup>/s July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	74	63	66	58	87	144	112	66	54	81	58
2	55	76	58	68	60	87	144	116	69	71	73	59
3	62	83	55	72	60	85	138	122	70	52	68	62
4	68	94	55	78	62	75	145	99	71	48	65	60
5	71	85	55	83	62	70	148	88	73	47	60	57
6	72	73	57	90	64	70	147	81	73	43	63	50
7	66	86	63	87	66	85	143	104	69	44	65	48
8	70	83	70	83	68	100	138	108	66	40	62	60
9	75	83	68	77	68	110	156	110	62	50	59	64
10	76	84	68	73	70	115	137	106	62	56	61	59
11	76	83	66	70	70	110	152	110	66	54	61	71
12	78	83	63	70	72	105	163	84	67	56	63	70
13	78	85	60	80	74	105	153	102	67	55	69	68
14	69	86	60	82	76	112	141	93	66	53	63	62
15	73	82	62	82	78	130	126	100	61	54	62	62
16	71	75	60	80	80	143	131	98	62	54	67	62
17	69	82	60	80	84	144	141	97	62	55	66	61
18	70	77	60	75	84	153	125	94	55	51	58	59
19	70	77	58	72	86	156	114	91	58	51	60	61
20	77	85	60	70	87	159	104	86	58	52	74	61
21	79	86	65	73	90	167	100	86	57	56	84	59
22	83	82	67	75	85	168	105	85	54	55	74	66
23	84	83	66	78	85	172	101	84	51	52	65	68
24	91	80	64	78	85	171	112	80	51	74	63	65
25	87	86	63	76	87	171	108	79	57	67	62	71
26	93	91	64	75	85	166	101	80	66	58	63	66
27	95	81	70	75	85	164	103	85	63	51	59	77
28	86	63	75	75	85	164	117	78	61	52	61	68
29	85	63	75	73	---	156	134	75	58	70	59	62
30	89	65	73	70	---	155	128	73	54	88	71	72
31	81	---	68	58	---	150	---	68	---	86	67	---
TOTAL	2357	2416	1971	2344	2116	4005	3899	2874	1875	1749	2028	1888
MEAN	76.0	80.5	63.6	75.6	75.6	129	130	92.7	62.5	56.4	65.4	62.9
MAX	95	94	75	90	90	172	163	122	73	88	84	77
MIN	55	63	55	58	58	70	100	68	51	40	58	48
AC-FT	468	4790	3910	4650	4200	7940	7730	5700	3720	3470	4020	3740

CAL YR 1984	TOTAL	39650	MEAN	108	MAX	300	MIN	46	AC-FT	78650
WTR YR 1985	TOTAL	29522	MEAN	80.9	MAX	172	MIN	40	AC-FT	58560

## WHITE RIVER BASIN

## 06450500 LITTLE WHITE RIVER BELOW WHITE RIVER, SD

LOCATION (REVISED).--Lat 43°36'05", long 100°44'58", in SW¼ sec.23, T.42 N., R.29 W., Mellette County, Hydrologic Unit 10140203, on left bank at downstream side of bridge on U.S. Highway 83, 1.3 mi downstream from Pine Creek, and 2.0 mi north of town of White River.

DRAINAGE AREA.--1,570 mi<sup>2</sup>, approximately, of which about 1,310 mi<sup>2</sup> probably contributes directly to surface runoff.

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1965, published as South Fork White River below White River.

GAGE.--Water-stage recorder. Datum of gage is 1,912.78 ft. above National Geodetic Vertical Datum of 1929. Prior to June 8, 1968, at site 0.8 mi downstream at datum 4.50 ft. lower.

REMARKS.--Records good except those for winter period, Dec. 1 to Mar. 15, which are poor. Diurnal fluctuations caused by small powerplant 2.2 mi upstream. Several small diversions for irrigation and some storage in several small lakes above station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--36 years, 127 ft<sup>3</sup>/s (92,010 acre-ft/yr); median of yearly mean discharges, 120 ft<sup>3</sup>/s (86,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,700 ft<sup>3</sup>/s June 12, 1967 (gage height, 10.02 ft), site and datum then in use; maximum gage height, 11.21 ft June 7, 1968, site and datum then in use; maximum gage height at present site and datum, 15.46 ft June 7, 1968, from floodmarks; no flow for parts of several days in 1952, 1954, 1956; minimum daily discharge, 7 ft<sup>3</sup>/s July 31, Aug. 31, Sept. 1, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 629 ft<sup>3</sup>/s at 1400 hours, Mar. 19 (gage height, 3.72 ft); maximum gage height, 5.63 ft Feb. 21 (backwater from ice); minimum daily discharge, 27 ft<sup>3</sup>/s July 7, Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	76	103	75	65	100	145	112	59	49	70	59
2	62	87	65	77	65	100	137	106	60	47	62	56
3	64	67	64	80	67	97	140	103	74	69	54	49
4	53	71	62	83	67	95	161	100	71	43	50	61
5	57	84	62	85	70	90	163	100	71	61	47	47
6	66	55	60	75	70	85	146	98	63	47	48	47
7	68	67	65	60	72	85	148	94	59	27	43	27
8	68	73	70	70	72	90	136	85	57	32	49	52
9	72	80	75	72	75	100	132	83	52	45	42	59
10	75	94	75	70	75	120	129	79	93	31	48	54
11	71	92	74	65	78	125	124	88	54	49	49	92
12	69	85	70	70	80	120	125	94	36	46	65	66
13	71	80	68	80	82	115	129	82	56	45	56	64
14	90	76	68	85	85	130	126	88	56	47	57	59
15	53	80	68	85	85	200	124	86	59	47	60	52
16	67	82	67	85	90	264	120	96	54	47	57	59
17	69	77	65	80	90	282	113	71	52	47	61	56
18	77	82	64	80	93	200	121	69	47	44	66	52
19	88	92	65	80	93	240	131	73	43	46	69	56
20	77	94	67	75	95	205	137	76	38	47	108	61
21	76	107	72	75	95	215	133	71	43	44	78	56
22	77	88	74	65	95	214	131	71	47	45	84	56
23	76	93	74	70	92	216	131	68	43	44	86	56
24	77	86	70	80	92	200	124	71	41	43	85	54
25	76	93	70	85	95	192	124	69	43	61	84	56
26	74	77	75	85	100	183	133	70	56	55	84	59
27	73	88	80	80	100	180	145	80	56	35	81	56
28	77	79	82	80	95	176	117	75	56	40	88	66
29	72	86	80	75	---	166	111	70	52	45	89	66
30	72	102	78	75	---	160	115	65	49	81	94	69
31	71	---	75	70	---	156	---	66	---	93	66	---
TOTAL	2203	2493	2207	2372	2333	4901	3951	2559	1640	1502	2080	1722
MEAN	71.1	83.1	71.2	76.5	83.3	158	132	82.5	54.7	48.5	67.1	57.4
MAX	90	107	103	85	100	282	163	112	93	93	108	92
MIN	53	55	60	60	65	85	111	65	36	27	42	27
AC-FT	437	4940	4380	4700	4630	9720	7840	5080	3250	2980	4130	3420
CAL YR 1984	TOTAL	42666	MEAN	117	MAX	427	MIN	31	AC-FT	84630		
WTR YR 1985	TOTAL	29963	MEAN	82.1	MAX	282	MIN	27	AC-FT	59430		

## WHITE RIVER BASIN

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06452000 WHITE RIVER NEAR OACOMA, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 43°44'54", long 99°33'22", in SE¼SW¼ sec.3, T.103 N., R.73 W., Lyman County, Hydrologic Unit 10140204, on left bank at downstream side of bridge on State Highway 47, 1.5 mi downstream from Wagner Draw, 1.8 mi upstream from high-water line of Lake Francis Case, and 8.8 mi southwest of Oacoma.

DRAINAGE AREA.--10,200 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1928 to current year.

REVISED RECORDS.--WSP 786: Drainage area. WSP 1309: 1929-30(M).

GAGE.--Water-stage recorder. Datum of gage is 1,377.29 ft above National Geodetic Vertical Datum of 1929. See WSP 1709, 1729, or 1917 for history of changes prior to Feb. 27, 1960.

REMARKS.--Records good except those for winter periods, Nov. 1 and Nov. 4 to Mar. 14, which are poor. Some diversions for irrigation above station. Gage-height telemeter and U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--57 years, 523 ft<sup>3</sup>/s (378,900 acre-ft/yr); median of yearly mean discharges, 440 ft<sup>3</sup>/s (319,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 51,900 ft<sup>3</sup>/s Mar. 30, 1952 (gage height, 15.40 ft), site and datum then in use; maximum gage height, 23.59 ft Mar. 14, 1978 (ice jam); no flow Aug. 14-28, 1971, July 16-23, 1974, Aug. 29 to Sept. 9, Sept. 13, 1976, July 23 to Aug. 7, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 15	1900	*5,780	*8.74	Mar. 17	1600	5,580	8.66

Minimum daily discharge, 12 ft<sup>3</sup>/s July 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	65	42	23	40	110	329	212	145	29	41	117
2	46	55	41	25	40	110	305	188	90	27	38	122
3	48	48	41	29	41	105	294	194	93	29	122	109
4	48	48	40	32	42	100	450	176	133	35	535	90
5	48	48	38	34	43	95	345	170	209	40	391	95
6	49	47	36	35	43	95	309	166	176	38	287	122
7	59	46	35	34	45	90	291	155	158	36	221	109
8	51	46	36	33	45	150	280	155	120	40	172	93
9	56	45	38	33	47	400	269	145	242	110	117	86
10	66	44	38	33	48	700	269	139	224	30	90	86
11	68	43	35	32	48	1100	262	139	212	20	64	86
12	64	42	32	32	50	2000	313	120	188	12	120	123
13	62	40	30	35	52	1800	276	102	182	13	85	396
14	60	39	29	38	54	2000	269	93	187	15	107	298
15	70	38	28	40	56	2380	302	88	495	14	125	333
16	68	37	28	40	56	2410	252	93	361	15	179	424
17	66	36	27	40	58	2720	227	83	284	26	280	309
18	72	35	27	40	60	1720	218	78	215	136	245	245
19	68	35	28	38	62	1730	212	68	179	402	176	188
20	62	36	29	38	62	1550	276	68	142	194	128	152
21	60	37	30	40	65	1320	240	60	109	80	142	136
22	60	40	28	45	80	999	209	48	97	43	133	125
23	59	44	25	46	95	810	200	46	86	31	114	117
24	58	46	22	48	105	696	185	35	76	80	206	109
25	58	44	22	49	105	600	179	36	68	471	654	100
26	59	43	23	48	110	550	182	41	68	510	474	95
27	56	42	24	47	115	500	200	48	70	269	353	88
28	54	40	25	47	110	465	222	58	60	149	287	86
29	56	40	25	46	---	440	245	56	45	82	215	86
30	54	42	24	44	---	400	224	231	35	60	169	83
31	56	---	24	40	---	345	---	280	---	54	139	---
TOTAL	1804	1291	950	1184	1777	28490	7834	3571	4749	3090	6409	4608
MEAN	58.2	43.0	30.6	38.2	63.5	919	261	115	158	99.7	207	154
MAX	72	65	42	49	115	2720	450	280	495	510	654	424
MIN	43	35	22	23	40	90	179	35	35	12	38	83
AC-FT	358	2560	1880	2350	3520	56510	15540	7080	9420	6130	12710	9140
CAL YR 1984	TOTAL	153439		MEAN	419	MAX	3430	MIN	22	AC-FT	304300	
WTR YR 1985	TOTAL	65757		MEAN	180	MAX	2720	MIN	12	AC-FT	130400	



## WHITE RIVER BASIN

06452000 WHITE RIVER NEAR OACOMA, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1945 to September 1953, October 1968 to September 1969, October 1971 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to September 1976, October 1977 to Sept. 30, 1981.

WATER TEMPERATURE: October 1974 to September 1976, October 1978 to current year.

SUSPENDED-SEDIMENT DISCHARGE: October 1971 to September 1976, October 1981 to current year.

REMARKS.--Sediment-discharge records fair. Flow affected by ice Nov. 1, Nov. 4 to Mar. 14. Sediment-discharge records prior to Oct. 1, 1971, on file in the District office, U.S. Army Corps of Engineers, Omaha, NE.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,950 microsiemens, Aug. 8, 1980; minimum daily, 370 microsiemens, Mar. 17, 1975.

WATER TEMPERATURE: Maximum daily, 30.0°C, July 30, 1975, July 10, 1976, July 10, 1980, Aug. 25, 1983; minimum daily, 0.5°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 72,300 mg/L, Apr. 15, 1974; minimum daily mean, 0 mg/L, July 17-23, 1974, Aug. 29 to Sept. 9, Sept. 13, 1976.

SEDIMENT LOAD: Maximum daily, 1,640,000 tons, May 17, 1982; 0 ton, July 17-23, 1974, Aug. 29 to Sept. 9, Sept. 13, 1976.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum daily, 29.0°C, July 12; minimum daily, 0.0°C on many days during winter period.

SEDIMENT CONCENTRATION: Maximum daily mean, 59,400 mg/L, Aug. 24; minimum daily mean, 56 mg/L, Mar. 5.

SEDIMENT LOAD: Maximum daily, 97,700 tons, Mar. 17; minimum daily, 2.8 tons, July 12.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 1984												
01...	12:50	65	681	7.8	-5.0	1.0	150	745	12.9	93	K23	K130
DEC 28...	12:00	26	1060	8.4	-5.0	0.5	5.7	724	14.0	103	K10	K160
FEB 21...	15:55	63	891	8.1	3.0	1.5	220	730	13.5	101	--	--
APR 22...	15:00	206	657	8.3	17.0	16.5	450	736	8.2	87	K90	K145
JUN 14...	12:50	138	583	8.1	19.0	21.0	3300	729	8.8	104	K20	K30
AUG 12...	14:00	125	550	8.5	18.0	19.0	38	726	8.1	92	--	--

DATE	HARD- NESS (MG/L AS CaCO3)	HARD- NESS, NONCAR- BONATE (MG/L CaCO3)	CALCIUM DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LILITY FIELD (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS Cl)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 1984												
01...	160	--	50	7.4	85	53	3	7.1	178	160	11	0.5
DEC 28...	280	--	92	13	150	52	4	12	392	210	16	0.7
FEB 21...	230	61	65	16	100	48	3	7.1	168	270	21	0.5
APR 22...	150	--	48	6.6	81	53	3	7.3	172	140	11	0.5
JUN 14...	46	--	16	1.5	110	82	7	5.2	152	100	8.4	0.6
AUG 12...	27	--	9.7	0.7	110	88	10	5.1	128	120	7.8	0.6

06452000 WHITE RIVER NEAR OACOMA, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 1984												
01...	41	539	470	0.73	95	<0.10	0.03	0.04	0.6	0.24	--	0.05
DEC 28...	70	818	800	1.1	57	1.50	0.08	0.1	0.7	0.15	--	0.15
FEB 1985												
21...	34	611	620	0.83	104	0.92	0.10	0.13	1.0	0.31	--	0.15
APR 22...	33	434	430	0.59	241	0.18	0.10	0.13	1.5	0.83	--	0.38
JUN 14...	31	378	360	0.51	141	1.40	0.05	0.06	3.4	--	--	0.07
AUG 12...	28	364	360	0.5	123	1.20	0.04	0.05	5.6	12.0	37	0.02

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 1984												
01...	<0.01	<10	36	45	<0	<1	2	<3	4	4	3	44
DEC 28...	0.14	--	--	--	--	--	--	--	--	--	--	--
FEB 1985												
21...	0.13	<10	4	43	3	<1	<1	<3	17	14	<1	73
APR 22...	0.03	30	12	32	<0.5	1	<1	<3	28	14	3	45
JUN 14...	0.04	310	16	21	<0.5	<1	<1	<3	5	39	4	42
AUG 12...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1984												
01...	11	<0.1	<10	2	<1	<1	380	9	6	378	66	99
DEC 28...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 1985												
21...	33	<0.1	<10	5	2	<1	620	<6	10	--	--	--
APR 22...	8	0.1	<10	2	2	<1	330	15	4	--	--	--
JUN 14...	2	0.4	<10	3	1	<1	94	32	8	14800	5510	100
AUG 12...	--	--	--	--	--	--	--	--	--	14400	4860	84

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM
DEC 1984											
03...	1330	41	0	--	64	76	94	98	99	100	--
MAR 20...	1350	1600	5.0	--	48	58	79	93	93	97	100
SEP 13...	1515	400	19.0	--	66	81	95	96	96	97	99

## WHITE RIVER BASIN

06452000 WHITE RIVER NEAR OACOMA, SD--Continued

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
RANDOM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.0	1.0	---	---	---	3.0	5.0	18.0	19.0	24.0	20.0	---
2	14.0	.0	---	.0	---	.0	12.0	17.0	---	24.0	21.0	---
3	13.0	10.0	.0	---	---	---	11.0	19.0	12.0	26.0	22.0	23.0
4	14.0	---	---	---	---	---	7.0	20.0	15.0	---	---	24.0
5	17.0	6.0	1.0	---	---	1.0	5.0	---	19.0	23.0	23.0	25.0
6	16.0	5.0	---	---	.0	1.0	5.0	16.0	21.0	24.0	24.0	24.0
7	---	8.0	---	---	---	1.0	---	16.0	27.0	---	25.0	21.0
8	15.0	6.0	---	---	---	2.0	6.0	17.0	25.0	26.0	26.0	---
9	14.5	5.0	---	.0	---	1.0	9.0	19.0	---	26.0	18.0	17.0
10	17.0	.0	---	---	---	---	13.0	24.0	17.0	27.0	16.0	16.0
11	16.0	---	---	---	---	1.0	15.0	22.0	15.0	24.0	---	17.0
12	16.0	---	.0	---	---	1.0	16.0	---	17.0	29.0	19.0	17.0
13	12.0	4.0	---	---	.0	1.0	10.0	15.0	17.0	28.0	20.0	19.0
14	---	9.0	---	---	---	1.0	---	15.0	21.0	---	19.0	16.0
15	9.0	1.0	---	---	---	3.0	17.0	15.0	20.0	24.0	18.0	---
16	7.0	5.0	---	.0	---	4.0	14.0	15.0	---	25.0	19.0	18.0
17	7.0	---	---	---	---	---	19.0	15.0	17.0	26.0	18.0	19.0
18	6.0	---	---	---	---	3.0	19.0	19.0	16.0	26.0	---	19.0
19	4.0	---	1.0	---	---	3.0	20.0	---	19.0	24.0	19.0	22.0
20	4.0	---	---	---	3.0	5.0	17.0	19.0	21.0	24.0	19.0	13.0
21	---	---	---	---	1.5	9.0	---	20.0	21.0	---	22.0	13.0
22	4.0	---	---	---	2.0	7.0	16.5	20.0	19.0	26.0	22.0	---
23	4.0	---	---	.0	3.0	7.0	14.0	21.0	---	27.0	21.0	9.0
24	6.0	---	---	---	---	---	14.0	22.0	22.0	23.0	18.0	8.0
25	7.0	---	---	.0	3.0	7.0	12.0	22.0	24.0	23.0	---	8.0
26	9.0	---	.0	---	1.0	9.0	7.0	---	18.0	22.0	19.0	7.0
27	8.0	---	---	---	1.0	9.0	11.0	---	18.0	23.0	20.0	10.0
28	---	---	.5	---	3.0	8.0	---	21.0	19.0	---	23.0	7.0
29	5.0	---	---	---	---	5.0	19.0	22.0	19.0	21.0	23.0	---
30	3.0	---	---	.0	---	2.0	19.0	22.0	---	18.0	22.0	6.0
31	5.0	---	---	---	---	---	---	18.0	---	20.0	22.0	---

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS) (000061)	TEMPER- ATURE (DEG C) (00010)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM (70337)	SED. SUSP. FALL DIAM. % FINER THAN .004 MM (70338)	SED. SUSP. FALL DIAM. % FINER THAN .016 MM (70340)	SED. SUSP. FALL DIAM. % FINER THAN .062 MM (70342)	SED. SUSP. FALL DIAM. % FINER THAN .125 MM (70343)	SED. SUSP. FALL DIAM. % FINER THAN .250 MM (70344)	SED. SUSP. FALL DIAM. % FINER THAN .500 MM (70345)
DEC											
03...	1330	--	--	--	64	76	94	98	99	100	--
MAR											
20...	1350	--	--	--	48	58	79	93	93	97	100
SEP											
13...	1515	--	19.0	--	66	81	95	96	96	97	99

## 06452000 WHITE RIVER NEAR OACOMA, SD--Continued

SUSPENDED-SEDIMENT DISCHARGE, IN TONS PER DAY, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
OCTOBER			NOVEMBER			DECEMBER			
1	43	445	52	65	535	94	42	600	68
2	46	476	59	55	302	45	41	580	64
3	48	358	46	48	565	73	41	544	60
4	48	330	43	48	566	73	40	400	43
5	48	493	64	48	571	74	38	291	30
6	49	276	37	47	398	51	36	290	28
7	59	318	51	46	352	44	35	300	28
8	51	360	50	46	388	48	36	300	29
9	56	372	56	45	522	63	38	330	34
10	66	518	92	44	414	49	38	400	41
11	68	636	117	43	449	52	35	390	37
12	64	424	73	42	484	55	32	368	32
13	62	553	93	40	520	56	30	320	26
14	60	543	88	39	637	67	29	290	23
15	70	533	101	38	550	56	28	250	19
16	68	418	77	37	486	49	28	230	17
17	66	324	58	36	422	41	27	210	15
18	72	890	173	35	500	47	27	200	15
19	68	1250	229	35	600	57	28	202	15
20	62	1500	251	36	700	68	29	210	16
21	60	1090	177	37	680	68	30	220	18
22	60	450	73	40	600	65	28	200	15
23	59	356	57	44	540	64	25	180	12
24	58	435	68	46	500	62	22	160	9.5
25	58	500	78	44	500	59	22	170	10
26	59	515	82	43	520	60	23	168	10
27	56	494	75	42	500	57	24	190	12
28	54	484	71	40	460	50	25	200	13
29	56	474	72	40	500	54	25	200	13
30	54	483	70	42	550	62	24	190	12
31	56	342	52	---	---	---	24	190	12
TOTAL	1804	---	2685	1291	---	1763	950	---	776.5
JANUARY			FEBRUARY			MARCH			
1	23	204	13	40	75	8.1	110	950	282
2	25	210	14	40	75	8.1	110	1560	463
3	29	230	18	41	80	8.9	105	970	275
4	32	230	20	42	90	10	100	390	105
5	34	240	22	43	100	12	95	56	14
6	35	230	22	43	107	12	95	98	25
7	34	200	18	45	110	13	90	62	15
8	33	180	16	45	105	13	150	100	40
9	33	165	15	47	95	12	400	139	150
10	33	160	14	48	90	12	700	200	378
11	32	150	13	48	85	11	1100	283	841
12	32	150	13	50	80	11	2000	364	1970
13	35	140	13	52	75	11	1800	806	3920
14	38	140	14	54	80	12	2000	2530	13700
15	40	135	15	56	85	13	2380	11400	73300
16	40	134	14	56	90	14	2410	11400	74200
17	40	140	15	58	100	16	2720	14600	107000
18	40	140	15	60	110	18	1720	17200	79900
19	38	130	13	62	130	22	1730	15400	71900
20	38	130	13	62	151	25	1550	13200	55200
21	40	120	13	65	200	35	1320	12100	43100
22	45	120	15	80	278	60	999	8470	22800
23	46	120	15	95	445	114	810	6160	13500
24	48	120	16	105	360	102	696	5940	11200
25	49	120	16	105	295	84	600	6090	9870
26	48	110	14	110	580	172	550	4990	7410
27	47	100	13	115	590	183	500	4000	5400
28	47	90	11	110	570	169	465	3340	4190
29	46	80	9.9	---	---	---	440	2550	3030
30	44	69	8.2	---	---	---	400	2570	2780
31	40	70	7.6	---	---	---	345	2000	1860
TOTAL	1184	---	448.7	1777	---	1181.1	28490	---	608818



## WHITE RIVER BASIN

06452000 WHITE RIVER NEAR OACOMA, SD--Continued

SUSPENDED-SEDIMENT DISCHARGE, IN TONS PER DAY, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN- TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
APRIL			MAY			JUNE			
1	329	1440	1280	212	422	242	145	3740	1460
2	305	1440	1190	188	438	222	90	1650	401
3	294	1400	1110	194	475	249	93	1100	276
4	450	5060	6150	176	1390	661	133	480	172
5	345	2500	2330	170	1530	702	209	4620	2610
6	309	1340	1120	166	1670	748	176	1650	784
7	291	1100	864	155	1280	536	158	682	291
8	280	869	657	155	1120	469	120	453	147
9	269	805	585	145	1280	501	242	37300	24400
10	269	726	527	139	1420	533	224	40700	24600
11	262	693	490	139	726	272	212	31900	18300
12	313	1350	1140	120	564	183	188	29800	15100
13	276	1190	887	102	366	101	182	26400	13000
14	269	1100	799	93	272	68	187	19600	9900
15	302	1010	824	88	275	65	495	47600	63600
16	252	2190	1490	93	274	69	361	41400	40400
17	227	3170	1940	83	212	48	284	36500	28000
18	218	3480	2050	78	157	33	215	33900	19700
19	212	2860	1640	68	149	27	179	35500	17200
20	276	2240	1670	68	141	26	142	31600	12100
21	240	1760	1140	60	123	20	109	26400	7770
22	209	1280	722	48	142	18	97	20100	5260
23	200	965	521	46	129	16	86	18000	4180
24	185	679	339	35	140	13	76	1600	328
25	179	444	215	36	210	20	68	14100	2590
26	182	494	243	41	200	22	68	10800	1980
27	200	390	211	48	190	25	70	8950	1690
28	222	552	331	58	189	30	60	5160	836
29	245	714	472	56	202	31	45	2580	313
30	224	429	259	231	5520	3440	35	2230	211
31	---	---	---	280	10300	7790	---	---	---
TOTAL	7834	---	33196	3571	---	17180	4749	---	317599
JULY			AUGUST			SEPTEMBER			
1	29	1890	148	41	316	35	117	6600	2080
2	27	2510	183	38	456	47	122	8000	2640
3	29	835	65	122	9020	2970	109	7900	2320
4	35	1100	104	535	65300	94300	90	5150	1250
5	40	1360	147	391	55700	58800	95	6400	1640
6	38	444	46	287	49100	38000	122	12600	4150
7	36	541	53	221	41700	24900	109	12400	3650
8	40	637	69	172	35800	16600	93	11700	2940
9	110	592	176	117	31900	10100	86	10900	2530
10	30	282	23	90	26700	6490	86	4100	952
11	20	264	14	64	21300	3680	86	4100	952
12	12	86	2.8	120	16100	5220	123	5380	1790
13	13	112	3.9	85	15600	3580	396	27600	29500
14	15	102	4.1	107	11300	3260	298	23400	18800
15	14	93	3.5	125	11600	3920	333	24900	22400
16	15	113	4.6	179	18000	8700	424	27000	30900
17	26	1100	77	280	8010	6060	309	22000	18400
18	136	8580	3150	245	8030	5310	245	17600	11600
19	402	11800	12800	176	8050	3830	188	14000	7110
20	194	4840	2540	128	4740	1640	152	11900	4880
21	80	1650	356	142	3080	1180	136	11900	4370
22	43	352	41	133	7090	2550	125	10900	3680
23	31	349	29	114	7470	2300	117	9820	3100
24	80	4400	950	206	13100	7290	109	8200	2410
25	471	5940	7550	654	45600	80500	100	5340	1440
26	510	5490	7560	474	36100	46200	95	5310	1360
27	269	6270	4550	353	29900	28500	88	3530	839
28	149	4120	1660	287	23000	17800	86	2730	634
29	82	1980	438	215	16700	9690	86	1800	418
30	60	1140	185	169	12100	5520	83	867	194
31	54	383	56	139	7530	2830	---	---	---
TOTAL	3090	---	42988.9	6409	---	501802	4608	---	188929

## MISSOURI RIVER BASIN

137

06452380 ANDES CREEK NEAR ARMOUR, SD

LOCATION.--Lat 43°15'23", long 98°24'08", in SW¼NW¼ sec.3, T.98 N., R.64 W., Charles Mix County, Hydrologic Unit 10140101, at bridge 2.8 mi east of U.S. Highway 281 and 2 mi north of Lake Andes.

PERIOD OF RECORD.--April 1983 to current year.

REMARKS.--The stream flows only during the wet season. Samples are collected only when flow is greater than 2 ft<sup>3</sup>/s.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
FEB 1985											
20...	11:15	5.4	600	7.7	9.5	2.0	--	230	150	59	21
MAR											
21...	11:00	8.7	900	7.9	18.0	8.0	721	390	280	97	37
APR											
03...	10:45	2.6	1400	7.9	12.5	12.5	716	620	440	160	54

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
FEB 1985										
20...	27	18	0.8	25	83	210	11	<0.1	11	420
MAR										
21...	43	18	1	25	110	330	26	0.1	15	640
APR										
03...	63	17	1	47	177	550	33	0.2	18	1000

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
FEB 1985										
20...	0.57	6.1	1.30	1.30	8.0	41	2.10	1.80	80	1.50
MAR										
21...	0.87	15	1.30	1.30	2.0	15	0.73	0.64	120	0.57
APR										
03...	1.4	7.2	<0.10	<0.10	1.6	--	0.36	0.31	170	0.24

## MISSOURI RIVER BASIN

06452383 LAKE ANDES TRIBUTARY NO. 3 NEAR ARMOUR, SD

LOCATION.--Lat 43°15'23", long 98°25'58", in SW¼NE¼ sec.5, T.98 N., R.64 W., Charles Mix County, Hydrologic Unit 10140101, at bridge 4.3 mi east of U.S. Highway 281.

PERIOD OF RECORD.--October 1984 to September 1985.

REMARKS.--Streamflow occurs only during the wet season. Samples are taken when flow exceeds 2 ft³/s.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
FEB 1985 20...	13:45	4.4	750	8.0	14.5	3.0	300	210	70	30
DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
FEB 1985 20...	20	11	0.5	34	90	260	15	<0.1	12	500
DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
FEB 1985 20...	0.68	5.9	1.50	1.50	7.0	38	2.00	1.80	50	1.60

## MISSOURI RIVER BASIN

139

06452392 LAKE ANDES NEAR LAKE ANDES, SD

LOCATION.--Lat 43°10'10", long 98°27'35", sec.31, T.97 N., R.64 W., Charles Mix County, Hydrologic Unit 10140101, at bridge on section line road crossing the lake on T.96 and 97 N. boundary.

PERIOD OF RECORD.--September 1983 to September 1985.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	HARD- NESS (MG/L AS CaCO3)	HARD- NESS, NONCAR- BONATE (MG/L CaCO3)	CALCIUM DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)
OCT 1984										
18...	12:30	1310	8.2	8.5	10.5	713	550	340	140	49
NOV										
14...	13:15	1750	8.2	16.0	7.0	714	830	600	230	61
DEC										
05...	13:50	1750	8.4	-8.0	0.5	731	800	580	220	61
JAN 1985										
09...	14:30	1480	8.7	-8.0	4.0	728	680	480	170	61
FEB										
21...	08:45	2060	7.6	0.0	7.0	719	1100	810	290	82
MAR										
21...	14:15	1400	7.9	16.0	10.0	720	680	530	190	51
APR										
03...	14:05	1420	8.3	13.5	11.5	715	600	420	140	62
18...	12:00	1480	8.4	29.0	19.0	713	680	480	180	57
MAY										
01...	12:15	1460	8.3	16.0	17.0	727	650	470	170	54
15...	13:30	2080	7.9	13.5	14.5	721	950	770	270	66
JUN										
04...	12:15	2100	7.8	21.0	17.0	729	980	790	280	68
24...	10:30	1580	8.7	26.0	22.0	720	730	550	190	62
JUL										
24...	12:15	1550	9.1	23.0	24.0	716	650	520	160	61
AUG										
07...	10:30	1800	8.8	27.0	25.0	722	830	680	220	69
28...	12:00	2200	8.6	25.0	24.0	722	1100	980	310	81
SEP										
25...	11:00	1600	8.4	10.0	12.0	721	640	500	160	59

DATE	SODIUM, DIS- SOLVED (MG/L AS Na)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINEITY LAB (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT 1984										
18...	61	18	1	43	213	450	34	0.4	23	930
NOV										
14...	72	15	1	52	223	690	70	0.7	19	1300
DEC										
05...	75	16	1	47	223	660	58	0.6	19	1300
JAN 1985										
09...	72	17	1	51	195	620	44	0.5	19	1200
FEB										
21...	95	15	1	63	254	920	90	0.9	10	1700
MAR										
21...	58	15	1	39	155	600	56	0.5	9.4	1100
APR										
03...	76	20	1	29	184	550	42	0.5	5.7	1000
18...	67	16	1	46	204	630	45	0.5	15	1200
MAY										
01...	64	17	1	45	181	590	43	0.5	15	1100
15...	80	15	1	55	181	1000	81	0.8	23	1700
JUN										
04...	78	14	1	55	191	800	73	0.8	28	1500
24...	76	17	1	47	178	720	49	0.6	27	1300
JUL										
24...	75	19	1	51	131	650	52	0.6	29	1200
AUG										
07...	84	17	1	59	151	760	66	0.7	32	1400
28...	100	16	1	58	126	970	96	0.9	25	1700
SEP										
25...	77	19	1	56	143	620	51	0.5	23	1100



## MISSOURI RIVER BASIN

06452392 LAKE ANDES NEAR LAKE ANDES, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
OCT 1984										
18...	1.3	0.24	0.20	2.2	11	0.32	--	0.20	250	0.19
NOV										
14...	1.8	0.46	0.50	2.6	14	0.37	--	0.30	240	0.26
DEC										
05...	1.7	0.55	0.60	2.3	13	0.49	--	0.16	210	0.13
JAN 1985										
09...	1.6	<0.10	<0.10	2.3	--	0.13	--	0.03	290	<0.01
FEB										
21...	2.3	<0.10	<0.10	2.0	--	0.37	--	0.27	270	0.24
MAR										
21...	1.5	<0.10	<0.10	1.7	--	0.29	--	0.18	180	0.16
APR										
03...	1.4	<0.10	0.40	1.7	9.3	0.15	--	0.08	240	0.04
18...	1.6	<0.10	<0.10	2.0	--	0.18	--	0.10	240	0.07
MAY										
01...	1.5	<0.10	0.30	1.4	7.5	0.13	--	0.09	260	0.04
15...	2.3	0.14	0.40	--	--	0.26	--	0.22	260	0.20
JUN										
04...	2.0	<0.10	--	--	--	0.26	0.8	0.26	280	0.21
24...	1.7	<0.10	<0.10	2.5	--	0.40	1.2	0.18	270	0.15
JUL										
24...	1.6	<0.10	<0.10	2.7	--	0.53	1.6	0.32	170	0.27
AUG										
07...	1.9	0.12	0.30	2.8	14	0.54	1.7	0.43	300	0.33
28...	2.3	<0.10	0.30	1.7	8.9	0.28	0.86	0.26	240	0.18
SEP										
25...	1.5	0.12	0.10	1.9	8.9	0.97	3.0	0.90	280	0.80

## MISSOURI RIVER MAIN STEM

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## 06452500 LAKE FRANCIS CASE AT PICKSTOWN, SD

LOCATION.--Lat 43°04'05", long 98°33'15", in SE¼ sec.5, T.95 N., R.65 W., Charles Mix County, Hydrologic Unit 10140101, in tower 6 of outlet works at Fort Randall Dam, on Missouri River at Pickstown, 1.0 mi upstream from Randall Creek, and at mile 880.0.

DRAINAGE AREA.--263,500 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--December 1952 to current year (monthend contents only). Prior to October 1964, published as Fort Randall Reservoir at Pickstown.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 25, 1953, elevations determined from temporary nonrecording gages.

REMARKS.--Reservoir is formed by earthfill dam; storage began in December 1952; initial closure made July 1952. Maximum capacity, 5,574,000 acre-ft below elevation 1,375.0 ft (top of spillway gates). Normal maximum, 4,589,000 acre-ft below elevation 1,365.0 ft. Inactive storage, 1,184,000 acre-ft below elevation 1,310.0 ft. No dead storage; elevation of invert of lowest outlet is 1,227.0 ft. Figures given herein represent elevations at outlet works and total contents adjusted for wind effect.

The spillway consists of 21 taintor gates, each 40 ft wide by 29 ft high; spillway capacity, 490,000 ft<sup>3</sup>/s at pool elevation 1,375 ft. Crest of spillway is at elevation 1,346 ft. Normal releases are through 12 tunnels 22 ft in diameter. Installation of power units in 8 of these tunnels was completed in January 1956; maximum release through power tunnels is 46,000 ft<sup>3</sup>/s; maximum release through 4 other tunnels is 130,000 ft<sup>3</sup>/s at pool elevation 1,375 ft. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Records of elevation and contents provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 5,087,000 acre-ft June 20, 1962, affected by wind; minimum since initial filling, 1,450,000 acre-ft Oct. 23, 1956, affected by wind.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,856,000 acre-ft Apr. 30; minimum contents 2,329,000 acre-ft Nov. 30 and Dec. 1.

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	1,354.31	3,635,000	-
Oct. 31 . . . . .	1,346.99	3,015,000	-620,000
Nov. 30 . . . . .	1,336.02	2,329,000	-686,000
Dec. 31 . . . . .	1,343.25	2,765,000	+436,000
CAL YR 1984 . . . . .	-	-	-191,000
Jan. 31 . . . . .	1,348.45	3,145,000	+380,000
Feb. 28 . . . . .	1,350.80	3,325,000	+180,000
Mar. 31 . . . . .	1,355.55	3,734,000	+409,000
Apr. 30 . . . . .	1,357.17	3,856,000	+122,000
May 31 . . . . .	1,354.68	3,653,000	-203,000
June 30 . . . . .	1,354.47	3,628,000	-25,000
July 31 . . . . .	1,355.51	3,710,000	+82,000
Aug. 31 . . . . .	1,356.39	3,794,000	+84,000
Sept. 30 . . . . .	1,353.40	3,557,000	-237,000
WTR YR 1985 . . . . .	-	-	-78,000

NOTE --Reservoir frozen over Dec. 20 to Mar. 25.

## MISSOURI RIVER MAIN STEM

06453000 MISSOURI RIVER AT FORT RANDALL DAM, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 43°03'54", long 98°33'11", in NW¼ sec.8, T.94 N., R.65 W., Charles Mix County, Hydrologic Unit 10170101, in powerhouse of Fort Randall Dam on Missouri River at Pickstown, 0.8 mi upstream from Randall Creek, and at mile 879.8.

DRAINAGE AREA.--263,500 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1947 to current year. Prior to October 1969 published as "below Fort Randall Dam".

GAGE.--Totalizing flowmeters on each turbine in Fort Randall powerhouse. Prior to Nov. 10, 1965, water-stage recorder at site 7.0 mi downstream at datum 1,230.00 ft above National Geodetic Vertical Datum of 1929 and Nov. 10, 1965, to June 30, 1969, at datum 5.00 ft lower (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good. Flow completely regulated by Fort Randall Dam (see station 06452500). Many diversions for irrigation above station.

COOPERATION.--Daily discharge determined from flow through turbines provided by U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--38 years, 25,200 ft<sup>3</sup>/s (18,257,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 447,000 ft<sup>3</sup>/s Apr. 12, 1952; maximum gage height, 20.82 ft Apr. 12, 1952 (site and datum then in use); minimum daily discharge, 100 ft<sup>3</sup>/s Mar. 29, 1962.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1943 reached a stage of about 16.5 ft. Maximum stage known, in April 1881, was about 5 ft higher than that of April 1943, both at site 7.0 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge during year, 44,000 ft<sup>3</sup>/s Oct. 19, 26, and 27; minimum daily, 4,100 ft<sup>3</sup>/s Apr. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42500	43500	37000	19000	18500	15000	25800	18700	25400	28800	29200	27500
2	42500	43500	36000	19000	18500	15000	21000	18000	28800	29200	28500	29900
3	41500	43600	33000	19000	18500	15000	21000	17800	27800	29100	28400	26500
4	41500	43500	30500	19000	18500	15000	20000	18300	26000	28400	28400	27300
5	41000	43600	26600	18000	17000	13900	17900	18300	24700	28200	29200	25200
6	40100	43600	23000	17000	16000	15000	18100	23300	27900	27200	29200	23200
7	40000	43600	22000	15000	16000	14700	18800	24600	26200	27000	29400	23300
8	40000	43500	21000	15000	16000	15000	20100	27100	25900	27400	29600	23700
9	40000	43600	21000	15000	17000	15000	23200	27700	27700	29100	28800	22600
10	39500	43500	19100	17000	17000	15000	24100	26000	28300	28800	28800	26300
11	39500	43400	19000	18000	17000	12000	23000	26500	27400	30200	29900	25700
12	40000	43200	18000	18500	16000	12000	22800	26600	27400	30000	29100	26200
13	40000	43000	18000	18500	16000	11000	22700	22600	26900	30000	26000	22800
14	40000	42900	19000	18500	16000	11000	23200	19900	27100	30300	25000	21400
15	39500	43100	21000	18500	15500	15900	24200	17800	27400	30600	25100	21300
16	39000	43000	20000	18100	15500	16000	24800	17300	28500	32600	26300	20600
17	38000	42700	20100	18100	15500	15000	24600	20300	28700	32700	25800	20800
18	40600	42800	21500	17000	15500	16000	25100	21900	28200	31800	26000	22500
19	44000	42600	22000	17000	15500	16000	24100	22900	28200	30400	26700	25000
20	41500	42400	21800	17000	14000	16000	23100	22100	28300	28800	28100	23700
21	40000	42400	21000	18000	12000	16000	22900	27100	28800	29200	28800	25000
22	41500	42300	19900	19000	12000	17000	21200	27200	28800	30000	28100	24700
23	42900	42100	20000	19000	12000	17000	15000	27400	29000	30800	26700	21600
24	43500	42000	19100	18500	12000	17500	7500	28500	29200	32000	26800	22600
25	43800	41900	18000	18500	13000	17500	6000	28000	30500	32700	27100	22800
26	44000	41900	18500	18000	14000	17100	5400	28000	28700	32200	27600	23300
27	44000	41900	19500	18000	16000	16000	4100	28300	26600	31000	27400	24500
28	43500	40000	18000	18000	16000	16000	4100	25700	26700	29300	28000	26400
29	43500	40000	18000	18100	---	17400	6400	26500	27200	29700	24800	26100
30	43500	37000	18000	18000	---	16700	18300	24300	28600	28400	24200	24300
31	43600	---	18500	18500	---	17000	---	24700	---	28800	26100	---
TOTAL	1284500	1276100	678100	553800	436500	474700	558500	733400	830900	924700	853100	726800
MEAN	41440	42540	21870	17860	15590	15310	18620	23660	27700	29830	27520	24230
MAX	44000	43600	37000	19000	18500	17500	25800	28500	30500	32700	29900	29900
MIN	38000	37000	18000	15000	12000	11000	4100	17300	24700	27000	24200	20600
AC-FT	254800	2531000	1345000	1098000	865800	941600	1108000	1455000	1648000	1834000	1692000	1442000
CAL YR 1984	TOTAL	9333500		MEAN	25500	MAX	44600	MIN	500	AC-FT18513000		
WTR YR 1985	TOTAL	9331100		MEAN	25560	MAX	44000	MIN	4100	AC-FT18508000		

## MISSOURI RIVER MAIN STEM

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06453000 MISSOURI RIVER AT FORT RANDALL DAM, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1973 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to September 1978.

WATER TEMPERATURE: October 1974 to September 1978.

DISSOLVED OXYGEN: October 1974 to September 1978.

INSTRUMENTATION.--Water-quality monitor since June 1973.

REMARKS.--Water is supplied to the monitor from the raw water intake located in the penstocks. This location is 121 ft below the normal pool surface. Depth of observation is 1,227 ft above mean sea level. Records prior to October 1974 are on file in the District office, U.S. Army Corps of Engineers, Omaha, NE. In addition to the water-quality monitor, samples were collected once a month.

COOPERATION.--Records of specific conductance, water temperature, dissolved oxygen, and pH were provided by the U.S. Army Corps of Engineers.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily mean, 850 microsiemens, Mar. 10, 1975; minimum daily mean, 606 microsiemens, Dec. 7, 1976.

WATER TEMPERATURE: Maximum daily mean, 25.5°C, Aug. 9, 12-16, 25, 1975, July 31 to Aug. 2, Aug. 5, 10, 1977, Aug. 25, 1978; minimum daily mean, 0.0°C, Jan. 21-26, 1975.

DISSOLVED OXYGEN: Maximum daily mean, 13.2 mg/L, Jan. 2, 3, Feb. 5-11, 14-21, 1975; minimum daily mean, 6.7 mg/L, Aug. 6, 8, 1977.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 1984												
14...	15:00	43000	780	8.6	12.5	9.5	12	718	11.0	102	K2	45
JAN 1985												
09...	16:00	14400	760	8.6	-3.0	1.0	0.6	732	--	--	K2	32
MAR												
21...	15:30	16000	770	8.6	18.5	4.0	0.9	724	13.6	109	<1	K10
MAY												
01...	14:15	20900	750	8.5	20.0	13.0	15	731	11.2	111	K1	48
JUL												
24...	15:00	38900	770	8.4	26.0	20.0	4.0	720	--	--	K9	30
SEP												
25...	13:00	25000	800	8.5	13.0	18.0	2.5	726	8.8	98	--	--

DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 1984												
14...	250	53	60	24	75	39	2	4.7	196	230	12	0.5
JAN 1985												
09...	240	73	58	23	74	40	2	4.7	167	230	10	0.5
MAR												
21...	270	83	66	25	77	38	2	5.0	185	240	13	0.5
MAY												
01...	260	87	63	24	75	38	2	4.7	170	230	10	0.5
JUL												
24...	250	86	60	24	75	39	2	5.1	163	220	11	0.5
SEP												
25...	240	81	58	24	74	39	2	4.9	163	220	10	0.5



## MISSOURI RIVER MAIN STEM

06453000 MISSOURI RIVER AT FORT RANDALL DAM, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SILICA DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
NOV 1984 14...	5.2	498	530	0.68	57800	<0.10	0.01	0.01	0.3	0.01	<0.01	<0.01
JAN 1985 09...	4.9	524	510	0.71	20400	<0.10	<0.01	--	0.2	0.01	<0.01	<0.01
MAR 21...	5.4	529	540	0.72	22900	<0.10	0.03	0.04	0.5	0.01	<0.01	0.01
MAY 01...	4.8	517	510	0.7	29200	<0.10	0.04	0.05	0.4	0.01	<0.01	<0.01
JUL 24...	5.0	515	500	0.7	54100	<0.10	0.04	0.05	0.2	<0.01	<0.01	0.02
SEP 25...	5.8	500	500	0.68	33800	<0.10	0.06	0.08	0.3	<0.01	<0.01	<0.01

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE DIS- SOLVED (UG/L AS MN)
NOV 1984 14...	10	2	37	1	<1	<1	<3	4	5	<1	54	9
JAN 1985 09...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 21...	10	2	41	<0.5	<1	<1	<3	6	6	<1	56	17
MAY 01...	<10	2	40	<0.5	<1	<1	<3	6	9	10	55	5
JUL 24...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 25...	30	2	49	<0.5	<1	<1	<3	2	<3	1	52	11

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1984 14...	<0.1	<10	3	2	<1	590	<6	10	43	4990	94
JAN 1985 09...	--	--	--	--	--	--	--	--	6	233	64
MAR 21...	<0.1	<10	3	1	<1	590	<6	6	11	475	61
MAY 01...	<0.1	<10	4	<1	<1	580	<6	11	29	1640	96
JUL 24...	--	--	--	--	--	--	--	--	11	1160	100
SEP 25...	<0.1	<10	4	2	<1	570	<6	6	6	405	98

## MISSOURI RIVER MAIN STEM

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06453010 MISSOURI RIVER AT GREENWOOD, SD

## STAGE RECORDS

LOCATION.--Lat 42°55'11", long 98°23'01", in SE¼NW¼ sec.35, T.94 N., R.64 W., Charles Mix County, Hydrologic Unit 10170101, on left bank 0.25 mi southeast of Greenwood at mile 865.0.

PERIOD OF RECORD.--1957 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,200.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Stage regulated by Fort Randall Dam 15.0 mi upstream. Prior to Oct. 1, 1980, gage heights in files of U.S. Army Corps of Engineers.

GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1		---		---	28.45	24.90	26.44	25.70	---	---		
2		---			28.13	24.88	26.40	25.62		---		
3		---			27.73	24.95	26.14	25.39		25.63		
4		---			27.46	24.74	26.05	25.55	27.17	---		
5		---			27.21	24.72	25.70	25.48	26.81	---		
6		---			26.78	24.77	25.40	25.94	26.92	---		
7		---			26.81	24.87	25.55	26.74	27.16	---		
8		---			26.79	24.76	25.74	26.87	26.91	---		
9		---			26.82	24.83	26.10	27.29	27.11	---		
10		---		25.88	27.16	24.85	26.74	27.02	27.27	---		
11		---		26.90	27.24	24.67	26.48	27.03	27.09	---		
12		---		28.40	26.65	24.17	26.50	26.99	27.07	---		
13		---		28.27	26.27	24.18	26.08	26.69	27.04	---		
14		---		27.49	26.03	24.10	26.53	25.91	27.06	---		
15		29.21		---	25.74	24.61	26.61	25.57	27.11	---		
16		29.30		---	25.36	25.22	26.68	25.26	27.12	---		
17		29.32		---	25.24	25.01	26.79	25.64	---	---		
18		29.29		---	25.16	25.01	26.76	25.95	---	---		
19		29.30		---	25.13	25.10	26.80	---	---	---		
20		29.30		---	25.00	25.06	26.51	---	---	---		
21		29.29		---	24.65	25.09	26.38	---	---	---		
22		---		---	24.32	25.23	26.36	---	---	---		
23		---		29.80	24.30	25.26	25.59	---	---	---		
24		---		29.30	24.28	25.32	23.88	---	26.54	---		
25		---		28.57	24.39	25.42	23.18	---	---	---		
26		---		28.28	24.48	25.40	23.01	---	---	---		
27		---		27.66	24.87	25.17	22.53	---	---	---		
28		---		27.10	25.12	25.02	22.35	---	---	---		
29		---		26.69	---	25.17	22.59	---	---	---		
30		---		26.90	---	25.09	24.57	---	---	---		
31		---		28.57	---	25.14	---	---	---	---		
MEAN		---		---	25.98	24.93	25.55	---	---	---		
MAX		---		---	28.45	25.42	26.80	---	---	---		
MIN		---		---	24.28	24.10	22.35	---	---	---		

## 06453200 CHOTEAU CREEK NEAR WAGNER, SD

LOCATION.--Lat 43°05'52", long 98°17'15", on section line between sec.27 and 28, T.95 N., R.63 W., Charles Mix County, Hydrologic Unit 10170101, at bridge on section line road 1.1 mi north of State Route 46.

PERIOD OF RECORD.--June 1983 to current year.

REMARKS.--Water-quality samples are taken only when discharge is greater than 2 ft<sup>3</sup>/s.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
NOV 1984											
15...	11:30	0.47	3200	8.4	5.0	2.0	729	1500	1400	360	150
DEC 05...	15:50	0.44	4200	8.4	-9.0	0.5	732	2100	1900	500	200
FEB 1985											
21...	12:10	0.74	1200	--	4.0	4.0	720	510	430	130	45
MAR 22...	10:30	48	810	8.3	14.0	8.0	718	350	180	85	34
APR 04...	13:05	20	1120	8.9	12.0	12.0	714	510	310	120	52
18...	14:25	5.9	1850	8.2	32.5	25.0	712	880	660	200	93
MAY 15...	15:20	12	1800	8.2	13.5	12.0	723	840	580	200	83
JUN 05...	10:30	11	2090	7.8	22.0	17.0	726	980	730	230	98

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)
NOV 1984											
15...	180	20	2	42	116	1500	85	0.2	1.2	2400	3.2
DEC 05...	280	22	3	47	209	2300	160	0.2	1.5	3600	4.9
FEB 1985											
21...	51	17	1	23	80	480	35	0.1	8.4	820	1.1
MAR 22...	38	18	0.9	18	172	270	13	0.1	14	580	0.78
APR 04...	60	20	1	19	208	410	16	0.2	5.0	810	1.1
18...	120	22	2	21	226	780	28	0.2	3.3	1400	1.9
MAY 15...	110	22	2	17	259	810	35	0.2	13	1400	1.9
JUN 05...	120	21	2	19	246	840	29	0.2	18	1500	2.0

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
NOV 1984										
15...	3.0	0.22	0.20	1.8	8.9	0.17	--	0.09	290	0.06
DEC 05...	4.3	0.19	0.20	1.8	8.9	0.10	--	0.06	550	0.03
FEB 1985										
21...	1.6	1.00	1.00	7.5	38	1.40	--	1.40	120	1.10
MAR 22...	75	1.10	1.10	2.2	15	0.42	--	0.29	90	0.24
APR 04...	44	<0.10	<0.10	1.9	--	0.29	--	0.05	110	0.05
18...	22	<0.10	<0.10	1.7	--	0.23	--	0.13	190	0.06
MAY 15...	46	<0.10	0.30	--	--	0.32	--	0.19	220	0.16
JUN 05...	45	<0.10	--	--	--	0.25	0.77	0.24	270	0.24

## MISSOURI RIVER BASIN

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06453252 CHOTEAU CREEK NEAR DANTE, SD

LOCATION.--Lat 43°01'32", long 98°10'03", on section line between sec.21 and 22, T.95 N., R.62 W., Charles Mix County, Hydrologic Unit 10170101, at bridge on section line road 0.9 mi southeast of Dante.

PERIOD OF RECORD.--June 1983 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)
OCT 1984										
18...	14:50	2.4	2530	8.1	10.0	9.0	712	1300	1000	290
NOV										
15...	14:25	1.2	2620	8.5	5.5	2.5	729	1300	1100	320
DEC										
06...	09:10	0.85	3800	8.2	-8.0	1.0	730	1700	1400	400
JAN 1985										
10...	12:45	0.38	3900	7.6	-7.0	0.5	733	2200	1700	490
FEB										
21...	15:05	16	1380	8.1	8.0	1.0	719	580	450	140
MAR										
22...	13:45	81	840	8.4	11.0	10.0	719	360	210	87
APR										
04...	10:05	20	1320	8.5	9.5	9.5	714	570	370	130
19...	10:55	6.2	2050	8.2	27.5	20.0	710	960	710	220
MAY										
02...	10:20	25	2310	8.2	18.0	18.0	728	1000	770	230
16...	08:35	27	1830	8.2	12.5	12.0	726	830	640	200
JUN										
05...	08:30	2.8	2210	8.2	17.0	16.0	728	1000	770	250
24...	15:25	0.22	2150	8.3	33.0	28.0	718	1000	780	230
JUL										
25...	10:55	0.1	2500	8.3	24.0	24.0	724	1200	1000	260
AUG										
07...	13:10	0.04	2630	7.8	33.0	27.0	725	1000	790	240
28...	15:00	0.71	1480	8.3	28.0	25.0	723	700	530	180
SEP										
26...	09:30	0.25	2280	7.9	11.0	9.5	725	1100	860	280

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)
OCT 1984										
18...	130	150	20	2	19	245	1300	70	0.3	10
NOV										
15...	130	190	23	2	19	283	1300	88	0.3	16
DEC										
06...	180	290	26	3	24	321	1800	180	0.4	9.4
JAN 1985										
10...	230	300	23	3	25	443	2000	170	0.4	19
FEB										
21...	55	75	21	1	22	123	540	44	0.2	9.6
MAR										
22...	34	41	19	1	18	143	280	16	0.1	14
APR										
04...	59	76	22	1	20	202	490	30	0.2	5.7
19...	100	140	24	2	23	248	890	56	0.3	6.5
MAY										
02...	110	160	25	2	22	261	1100	53	0.3	6.3
16...	81	120	23	2	16	193	840	56	0.2	16
JUN										
05...	100	150	24	2	17	267	970	54	0.3	16
24...	110	130	21	2	19	247	940	44	0.3	8.4
JUL										
25...	130	150	21	2	27	189	1300	45	0.4	6.8
AUG										
07...	100	120	20	2	25	219	1500	50	0.4	14
28...	61	67	17	1	18	167	630	20	0.3	9.9
SEP										
26...	100	110	17	1	23	247	1000	35	0.3	15



## MISSOURI RIVER BASIN

06453252 CHOTEAU CREEK NEAR DANTE, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
OCT 1984										
18...	2100	2.9	14	<0.10	2.3	0.29	--	0.03	480	0.02
NOV										
15...	2200	3.0	7.2	0.18	1.4	0.16	--	0.04	550	0.03
DEC										
06...	3100	4.2	7.1	<0.10	2.1	0.20	--	0.03	730	<0.01
JAN 1985										
10...	3500	4.8	3.6	1.10	2.1	0.16	--	0.04	750	0.01
FEB										
21...	960	1.3	42	1.10	8.0	--	--	0.85	170	0.77
MAR										
22...	580	0.78	126	0.60	1.8	0.38	--	0.26	110	0.22
APR										
04...	930	1.3	50	<0.10	1.9	0.35	--	0.13	160	0.09
19...	1600	2.2	27	<0.10	2.7	0.46	--	0.12	330	0.06
MAY										
02...	1800	2.5	124	<0.10	1.9	0.46	--	0.10	350	0.08
16...	1400	2.0	105	0.48	--	0.46	--	0.20	270	0.21
JUN										
05...	1700	2.3	13	<0.10	--	0.16	0.49	0.17	380	0.14
24...	1600	2.2	0.97	<0.10	3.0	0.70	2.1	0.13	550	0.08
JUL										
25...	2000	2.8	0.55	0.33	4.0	0.61	1.9	0.07	360	0.06
AUG										
07...	2200	3.0	0.24	0.31	4.4	0.63	1.9	0.20	630	0.13
28...	1100	1.5	2.1	<0.10	2.1	0.14	0.43	0.05	320	0.02
SEP										
26...	1700	2.3	1.2	<0.10	2.0	0.20	0.61	0.06	460	0.04

## CHOTEAU CREEK BASIN

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06453255 CHOTEAU CREEK NEAR AVON, SD

LOCATION.--Lat 42°55'24", long 98°06'21", in NW¼NW¼NW¼ sec.31, T.94 N., R.61 W., Bon Homme County, Hydrologic Unit 10170101, on left bank at downstream side of highway bridge, 6.3 mi southwest of Avon, 0.7 mi downstream from Dry Choteau Creek, and 12.7 mi upstream from mouth.

DRAINAGE AREA.--602 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,290 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for Aug. 28 to Sept. 25, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 9	1430	243	4.54	Apr. 24	0215	146	3.92
Mar. 13	1300	*287	*4.78	May 12	2000	228	4.45

Minimum daily discharge, 1.7 ft<sup>3</sup>/s Sept. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	8.2	7.0	5.0	4.6	29	31	55	12	4.2	2.6	4.0
2	6.1	7.4	7.0	5.1	4.4	28	29	44	11	4.2	2.5	5.0
3	6.1	7.2	7.0	5.8	4.2	37	27	35	11	3.9	2.5	4.0
4	6.1	7.2	7.0	5.7	4.0	25	26	29	12	4.0	2.4	4.0
5	6.5	6.9	7.0	5.4	4.0	20	27	26	11	3.8	2.2	4.0
6	8.3	6.8	6.7	5.5	4.0	26	29	22	10	3.8	2.2	4.0
7	8.6	6.8	6.5	5.5	4.1	44	29	21	14	3.7	2.1	4.0
8	7.7	6.5	6.8	5.5	4.2	130	28	19	15	3.5	2.1	4.0
9	8.1	6.6	7.0	5.5	4.2	185	26	18	15	3.5	1.9	4.0
10	8.8	6.8	7.2	5.5	4.2	169	23	16	15	3.4	2.0	4.0
11	8.9	7.3	7.2	5.3	4.2	124	21	20	15	3.2	2.1	4.0
12	8.9	7.2	7.0	5.2	4.2	180	21	103	13	3.2	3.1	3.0
13	9.1	7.2	6.2	5.3	4.3	275	19	117	13	3.1	2.4	4.0
14	9.5	7.2	6.4	5.4	4.4	267	18	50	12	2.9	2.3	3.0
15	12	6.8	6.7	5.4	4.4	220	17	41	10	3.2	2.2	3.0
16	17	6.4	7.5	5.4	7.5	184	15	39	9.2	3.5	4.0	2.5
17	14	6.4	7.2	5.3	15	163	14	37	7.2	3.8	7.7	2.0
18	13	6.4	6.5	5.0	27	157	13	37	6.6	3.8	7.1	2.0
19	22	6.7	6.4	5.0	30	157	12	37	6.1	3.5	4.1	2.0
20	20	6.7	6.2	5.0	39	144	13	35	5.9	3.1	2.9	2.0
21	16	6.8	6.1	5.0	51	126	16	35	5.5	3.2	2.8	2.0
22	14	7.0	6.1	5.0	29	99	18	31	4.6	3.0	5.1	2.0
23	15	7.2	6.1	5.1	27	77	79	28	4.2	2.9	11	2.0
24	13	7.6	5.6	5.2	18	59	117	24	4.1	2.7	22	2.0
25	12	7.8	5.5	4.8	17	45	65	21	4.2	2.8	9.1	2.0
26	11	9.0	5.5	4.8	24	36	53	20	7.4	2.8	3.9	2.1
27	12	8.5	5.5	4.8	34	34	66	18	7.2	3.0	3.3	1.7
28	10	8.4	6.0	4.8	39	33	65	16	5.8	2.6	3.0	1.8
29	10	8.0	5.6	4.8	---	31	53	16	5.0	2.4	3.0	1.8
30	9.4	8.0	5.5	4.6	---	32	49	17	4.5	2.6	3.0	1.9
31	8.5	---	5.3	4.6	---	32	---	14	---	2.6	3.0	---
TOTAL	337.1	217.0	199.3	160.3	420.9	3168	1019	1041	276.5	101.9	129.6	87.8
MEAN	10.9	7.23	6.43	5.17	15.0	102	34.0	33.6	9.22	3.29	4.18	2.93
MAX	22	9.0	7.5	5.8	51	275	117	117	15	4.2	22	5.0
MIN	5.5	6.4	5.3	4.6	4.0	20	12	14	4.1	2.4	1.9	1.7
AC-FT	66	430	395	318	835	6280	2020	2060	548	202	257	174
CAL YR 1984	TOTAL	62035.0		MEAN	169	MAX	3590	MIN	2.2	AC-FT	123000	
WTR YR 1985	TOTAL	7158.4		MEAN	19.6	MAX	275	MIN	1.7	AC-FT	14200	

## NIOBRARA RIVER BASIN

06464100 KEYA PAHA RIVER NEAR KEYAPAHA, SD

LOCATION.--Lat 43°07'45", long 100°06'24", in NW¼SW¼SW¼ sec.17, T.96 N., R.78 W., Tripp County, Hydrologic Unit 10140203, on left bank at downstream side of highway bridge, 2.0 mi northeast of Keyapaha, and 2.0 mi upstream from Sand Creek.

DRAINAGE AREA.--466 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,230 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 820 ft<sup>3</sup>/s May 3, 1983 (gage height, 7.95 ft); maximum gage height, 9.45 ft Feb. 20, 1982; minimum daily discharge, 3.4 ft<sup>3</sup>/s Feb. 10, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1952 reached a stage of about 14 ft, at present datum, from information by local residents.

EXTREMES FOR WATER YEAR 1982.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 20	unknown	*800	a*9.45	May 22	unknown	250	--
May 15	unknown	300	--	June 15	unknown	660	7.47

a Backwater from ice.

Minimum daily discharge, 3.4 ft<sup>3</sup>/s Feb. 10.

EXTREMES FOR WATER YEAR 1983.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 3	0415	*820	*7.95	June 20	0715	390	5.69
May 13	unknown	500	--	June 27	0645	550	6.74
June 13	2200	399	6.12				

Minimum daily discharge, 15 ft<sup>3</sup>/s Sept. 4.

EXTREMES FOR WATER YEAR 1984.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 9	1010	*310	a*5.58				

a Observed.

Minimum daily discharge, 11 ft<sup>3</sup>/s Sept. 4.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 15	1245	*215	a*5.46				

a Backwater from ice.

Minimum daily discharge, 6.6 ft<sup>3</sup>/s July 19.

No other peak greater than base discharge.

No other peak greater than base discharge.

## NIOBRARA RIVER BASIN

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06464100 KEYA PAHA RIVER NEAR KEYAPAHA, SD--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	11	14	10	6.0	150	32	24	100	40	31	19
2	8.5	12	15	9.5	5.5	120	33	23	90	42	30	17
3	9.5	12	15	9.0	5.5	100	33	22	83	43	30	18
4	10	12	15	8.0	5.0	80	33	22	75	45	31	17
5	10	13	15	7.5	5.0	60	32	21	65	47	32	19
6	11	13	16	7.0	4.5	50	33	20	60	48	32	19
7	11	13	16	6.0	4.0	45	33	20	60	53	32	20
8	10	12	16	5.5	4.0	45	35	20	67	65	30	17
9	10	12	16	5.0	3.5	47	44	19	64	63	28	16
10	9.5	13	15	5.0	3.4	49	48	25	60	54	27	16
11	10	13	15	5.5	4.0	52	50	40	55	55	27	17
12	11	13	14	6.0	15	50	48	80	50	50	28	27
13	12	13	14	7.0	25	45	52	200	100	42	27	32
14	12	13	11	7.0	35	45	40	250	600	38	25	28
15	11	12	10	6.5	55	65	37	270	650	59	24	28
16	11	12	11	6.5	80	60	37	180	350	55	23	28
17	11	13	14	6.5	100	52	35	140	250	45	22	27
18	11	13	14	6.5	200	54	35	110	180	50	22	26
19	10	10	15	6.0	350	50	34	100	150	45	23	25
20	10	12	15	6.0	700	43	33	150	120	45	25	27
21	11	14	14	6.0	650	37	32	200	110	42	30	27
22	11	15	14	6.5	500	35	32	210	95	41	40	28
23	12	15	14	7.0	400	35	30	200	85	40	45	26
24	13	14	13	7.0	300	37	29	170	75	40	43	25
25	13	14	13	8.0	250	40	28	160	70	39	30	23
26	14	14	13	8.0	200	45	27	130	60	39	27	23
27	14	13	12	7.5	180	40	26	110	55	38	24	23
28	13	13	12	7.0	170	30	25	100	50	38	20	22
29	12	12	12	7.0	---	33	26	90	46	37	19	21
30	11	13	11	6.5	---	32	25	100	44	35	18	20
31	11	---	11	6.0	---	31	---	110	---	33	18	---
TOTAL	341.9	384	425	212.5	4260.4	1657	1037	3316	3919	1406	863	681
MEAN	11.0	12.8	13.7	6.85	152	53.5	34.6	107	131	45.4	27.8	22.7
MAX	14	15	16	10	700	150	52	270	650	65	45	32
MIN	8.4	10	10	5.0	3.4	30	25	19	44	33	18	16
AC-FT	67	762	843	421	8450	3290	2060	6580	7770	2790	1710	1350
WTR YR 1982	TOTAL	18502.8		MEAN	50.7	MAX	700	MIN	3.4	AC-FT	36700	



## NIOBRARA RIVER BASIN

06464100 KEYA PAHA RIVER NEAR KEYAPAHA, SD--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	38	38	24	29	49	93	150	32	136	40	17
2	22	37	39	25	28	49	84	430	38	125	37	17
3	22	36	39	25	28	48	83	634	42	120	33	16
4	21	35	39	26	27	46	77	313	34	105	30	15
5	21	34	35	27	27	43	78	203	26	96	29	16
6	22	34	30	27	27	78	73	162	22	88	27	17
7	23	35	28	26	29	80	69	140	18	75	26	17
8	23	36	27	23	32	52	64	108	20	63	24	18
9	37	37	28	22	32	46	58	90	18	53	23	17
10	92	40	30	22	35	64	54	71	16	47	23	17
11	88	50	30	23	40	61	49	85	18	41	22	17
12	90	39	32	25	45	52	47	300	28	37	22	16
13	73	40	32	30	60	49	55	450	213	35	21	16
14	73	41	30	29	90	50	45	300	351	32	21	16
15	70	39	30	25	100	45	52	200	263	30	21	17
16	59	43	31	23	90	42	76	130	201	36	20	16
17	50	43	33	24	60	43	115	100	174	34	20	17
18	42	42	32	25	54	42	122	110	159	36	20	17
19	40	43	30	26	50	33	109	119	139	57	20	17
20	42	46	30	30	47	31	93	112	226	65	18	17
21	42	46	32	33	47	27	77	102	151	56	18	17
22	41	42	36	35	45	31	65	98	134	47	17	18
23	40	32	40	35	45	37	57	93	116	56	17	18
24	40	33	30	33	41	45	51	83	107	53	17	19
25	39	36	27	30	37	48	47	75	92	53	17	19
26	38	36	27	29	38	53	40	59	80	52	17	19
27	37	36	26	30	46	50	40	47	310	45	17	19
28	36	37	25	30	53	56	53	41	211	40	17	19
29	36	38	23	33	---	59	62	37	199	37	17	18
30	37	38	23	32	---	79	78	34	161	40	17	19
31	37	---	24	29	---	97	---	33	---	43	17	---
TOTAL	1355	1162	956	856	1282	1585	2066	4909	3599	1833	685	518
MEAN	43.7	38.7	30.8	27.6	45.8	51.1	68.9	158	120	59.1	22.1	17.3
MAX	92	50	40	35	100	97	122	634	351	136	40	19
MIN	21	32	23	22	27	27	40	33	16	30	17	15
AC-FT	269	2300	1900	1700	2540	3140	4100	9740	7140	3640	1360	1030
CAL YR 1982	TOTAL	20824.9		MEAN	57.1	MAX	700	MIN	3.4	AC-FT	41310	
WTR YR 1983	TOTAL	20806		MEAN	57.0	MAX	634	MIN	15	AC-FT	41270	

NIOBRARA RIVER BASIN

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06464100 KEYA PAHA RIVER NEAR KEYAPAHA, SD--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	20	25	29	43	70	78	85	74	16	17	13
2	19	20	25	30	50	60	76	87	64	18	18	12
3	19	20	26	32	48	55	79	88	58	19	18	12
4	21	21	26	34	45	50	85	86	51	20	18	11
5	21	21	25	34	43	45	121	79	47	21	18	12
6	21	21	24	35	43	45	153	75	49	20	18	12
7	20	21	24	35	45	50	199	75	49	20	17	12
8	20	21	25	34	50	60	272	76	46	20	16	13
9	19	22	25	32	60	70	291	75	45	23	15	13
10	19	23	26	30	70	85	200	70	45	26	15	14
11	19	23	26	27	80	80	166	71	43	29	15	16
12	19	24	27	25	75	80	148	79	44	25	14	15
13	19	25	28	25	75	100	145	72	43	24	14	15
14	20	30	26	24	85	150	182	66	42	23	14	16
15	20	32	25	23	80	153	198	60	39	27	17	17
16	20	30	25	22	75	122	176	46	38	30	17	16
17	20	30	23	22	72	89	150	42	38	28	18	17
18	20	29	23	21	70	89	132	41	38	25	20	16
19	21	29	22	21	65	87	111	42	37	23	19	15
20	22	28	21	22	65	89	92	41	35	21	19	14
21	24	28	21	22	70	104	81	37	35	19	24	15
22	24	28	20	23	100	100	74	36	32	18	21	14
23	23	30	20	25	95	94	69	33	28	16	17	13
24	22	28	21	28	85	90	63	31	26	16	18	12
25	21	28	23	31	80	88	60	31	22	20	17	18
26	20	28	23	32	75	86	62	33	21	27	16	17
27	20	27	24	34	70	89	74	65	19	24	14	18
28	20	27	25	35	72	88	81	96	18	20	13	18
29	19	26	25	35	75	88	78	102	17	19	12	18
30	20	25	27	36	---	85	80	95	17	18	13	19
31	20	---	27	39	---	81	---	86	---	16	13	---
TOTAL	631	765	753	897	1961	2622	3776	2001	1160	671	515	443
MEAN	20.4	25.5	24.3	28.9	67.6	84.6	126	64.5	38.7	21.6	16.6	14.8
MAX	24	32	28	39	100	153	291	102	74	30	24	19
MIN	19	20	20	21	43	45	60	31	17	16	12	11
AC-FT	125	1520	1490	1780	3890	5200	7490	3970	2300	1330	1020	879
CAL YR 1983	TOTAL	19482		MEAN	53.4	MAX	634	MIN	15	AC-FT	38640	
WTR YR 1984	TOTAL	16195		MEAN	44.2	MAX	291	MIN	11	AC-FT	32120	

## NIOBRARA RIVER BASIN

06464100 KEYA PAHA RIVER NEAR KEYAPAHA, SD--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	12	19	14	11	36	50	41	14	15	20	11
2	18	16	18	15	12	36	48	39	14	14	19	12
3	18	20	17	15	13	33	46	36	15	13	17	11
4	17	19	17	16	15	32	51	33	16	11	16	12
5	17	20	16	16	15	34	58	31	17	10	16	12
6	17	19	16	17	17	34	60	29	17	8.8	15	11
7	17	19	18	17	17	36	69	28	15	7.7	14	10
8	19	22	21	16	18	38	83	27	12	7.3	15	11
9	20	22	20	14	18	40	83	25	11	7.5	15	12
10	26	20	20	13	20	47	78	24	11	7.3	14	12
11	28	20	20	13	21	45	66	25	11	7.3	13	14
12	24	20	19	14	23	45	58	23	12	7.4	14	16
13	20	20	19	15	25	80	54	23	11	7.0	13	16
14	22	18	18	15	27	130	52	23	11	6.9	12	15
15	25	19	17	15	29	150	50	21	11	7.3	12	14
16	20	18	18	15	30	144	48	20	10	6.8	14	13
17	20	20	18	14	31	103	46	19	9.3	7.3	15	12
18	21	18	17	13	32	89	45	19	9.3	7.4	15	11
19	23	17	17	12	34	81	37	19	9.3	6.6	15	10
20	23	20	18	12	34	77	42	18	8.6	6.8	17	10
21	22	18	17	13	34	73	47	18	7.1	6.7	17	11
22	22	20	17	14	34	70	44	17	7.8	6.8	16	11
23	22	19	16	14	35	68	41	16	7.3	7.7	15	12
24	21	21	14	15	34	65	37	15	6.8	24	15	12
25	22	21	14	15	35	63	35	15	6.8	137	14	12
26	20	21	15	15	33	61	37	15	10	58	13	13
27	20	20	15	14	33	60	44	16	13	33	13	12
28	20	20	16	14	35	60	47	17	13	21	12	13
29	20	20	15	14	---	54	46	16	12	17	12	16
30	21	19	14	13	---	54	44	15	11	18	12	16
31	21	---	14	11	---	51	---	15	---	20	12	---
TOTAL	645	578	530	443	715	1989	1546	698	339.3	521.6	452	373
MEAN	20.8	19.3	17.1	14.3	25.5	64.2	51.5	22.5	11.3	16.8	14.6	12.4
MAX	28	22	21	17	35	150	83	41	17	137	20	16
MIN	17	12	14	11	11	32	35	15	6.8	6.6	12	10
AC-FT	128	1150	1050	879	1420	3950	3070	1380	673	1030	897	740
CAL YR 1984	TOTAL	15799		MEAN	43.2	MAX	291	MIN	11	AC-FT	31340	
WTR YR 1985	TOTAL	8829.9		MEAN	24.2	MAX	150	MIN	6.6	AC-FT	17510	

## 06464500 KEWA PAHA RIVER AT WEWELA, SD

LOCATION (REVISED).--Lat 43°01'44", long 99°46'49", in SE¼ sec.24, T.95 N., R.76 W., Tripp County, Hydrologic Unit 10150006, on right bank at downstream side of bridge on U.S. Highway 183, 1.0 mi north of Wewela, 4.5 mi upstream from Holt Creek, and 11.5 mi downstream from Lost Creek.

DRAINAGE AREA.--1,070 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--November 1937 to September 1940, October 1947 to current year. Monthly discharge only for October 1947, published in WSP 1309.

GAGE.--Water-stage recorder. Datum of gage is 2,049.78 ft above National Geodetic Vertical Datum of 1929. Prior to June 21, 1957, nonrecording gage at site 13 ft upstream at same datum. Prior to Aug. 23, 1984, recording gage on left bank 13 ft downstream from bridge at same datum.

REMARKS.--Records good except those for winter period, Nov. 29 to Mar. 15, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--40 years (water years 1939-40, 1948-85), 69.5 ft<sup>3</sup>/s (50,350 acre-ft/yr); median of yearly mean discharges, 58 ft<sup>3</sup>/s (42,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft<sup>3</sup>/s Mar. 31, 1952 (gage height, 13.08 ft); maximum gage height, 13.5 ft Mar. 25, 1950, from floodmark (backwater from ice); no flow Jan. 10 to Feb. 15, 1949, Aug. 19 to Sept. 14, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 12	1700	ice jam	a*3.87	b	--	*230	--

a Observed.

b Sometime during period Mar. 15, 16.

Minimum daily discharge, 13 ft<sup>3</sup>/s July 12-14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	41	43	30	22	40	95	95	29	27	44	29
2	37	38	40	31	23	40	95	86	29	29	43	30
3	37	42	33	33	23	38	97	79	30	27	41	31
4	37	41	32	35	23	36	123	74	33	25	38	32
5	36	39	30	37	24	36	134	71	34	22	36	37
6	36	38	30	37	25	40	132	69	33	21	34	36
7	36	37	35	35	25	42	132	68	31	20	33	33
8	36	37	45	33	26	45	137	65	28	20	33	30
9	41	36	45	32	27	50	138	62	26	18	33	29
10	42	34	44	32	27	55	138	59	25	17	33	30
11	42	34	42	29	28	52	126	61	26	14	35	35
12	44	36	40	31	29	55	123	57	25	13	62	43
13	42	38	38	33	30	100	105	53	25	13	47	46
14	40	60	37	33	30	180	97	50	24	13	45	46
15	41	64	38	33	31	210	99	49	23	14	39	41
16	42	58	36	33	32	220	94	48	23	17	37	38
17	42	60	33	32	33	204	94	47	23	32	38	34
18	44	58	33	30	34	191	84	45	25	40	38	31
19	47	56	34	29	35	170	85	45	28	43	38	30
20	47	57	35	27	36	157	89	42	27	29	40	30
21	47	56	35	28	38	147	99	41	26	25	42	31
22	45	51	34	29	38	142	111	39	25	23	42	33
23	45	51	32	30	36	134	105	37	25	23	40	34
24	43	52	30	31	36	126	97	35	23	52	37	34
25	42	52	30	32	37	121	87	33	24	46	37	35
26	41	52	32	32	36	117	85	33	39	105	34	36
27	41	52	34	31	35	113	102	34	37	62	32	35
28	41	46	35	30	37	112	121	34	33	43	35	37
29	41	45	33	29	---	109	112	33	31	36	33	41
30	40	47	31	28	---	99	102	31	29	39	32	45
31	41	---	30	22	---	97	---	30	---	42	31	---
TOTAL	1273	1408	1099	967	856	3278	3238	1605	839	950	1182	1052
MEAN	41.1	46.9	35.5	31.2	30.6	106	108	51.8	28.0	30.6	38.1	35.1
MAX	47	64	45	37	38	220	138	95	39	105	62	46
MIN	36	34	30	22	22	36	84	30	23	13	31	29
AC-FT	252	2790	2180	1920	1700	6500	6420	3180	1660	1880	2340	2090
CAL YR 1984	TOTAL	41133		MEAN	112	MAX	1020	MIN	23	AC-FT	81590	
WTR YR 1985	TOTAL	17747		MEAN	48.6	MAX	220	MIN	13	AC-FT	35200	

## MISSOURI RIVER MAIN STEM

06466700 LEWIS AND CLARK LAKE AT SPRINGFIELD, SD

## STAGE RECORDS

LOCATION.--Lat 42°51'21", long 97°53'06", in SW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$  sec.24, T.93 N., R.60 W., Bon Homme County, Hydrologic Unit 10170101, on left bank at east edge of Springfield at mile 832.20.

PERIOD OF RECORD.--August 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,200.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Stage regulated by Gavins Point Dam 21.2 mi downstream. Prior to Oct. 1, 1980, gage heights in files of U.S. Army Corps of Engineers.

GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.74	9.77	9.32	8.99	9.08	6.92	6.74	6.88	7.32	7.92	9.07	9.02
2	9.70	9.86	9.17	8.96	9.18	6.99	7.28	7.10	7.39	8.02	9.10	9.12
3	9.75	9.75	9.16	9.11	9.20	7.04	7.20	7.05	7.68	8.04	9.18	9.17
4	9.78	9.77	9.15	9.27	9.21	6.92	7.21	6.91	7.75	8.03	9.09	9.28
5	9.82	9.79	9.05	9.39	9.20	7.34	7.11	6.89	7.58	8.01	9.05	9.29
6	9.83	9.81	9.26	9.47	9.12	7.14	6.90	6.80	7.46	7.97	9.05	9.26
7	9.80	9.84	8.94	9.51	8.99	6.73	6.86	7.13	7.60	7.84	9.07	9.18
8	9.80	9.83	8.84	9.46	8.87	6.70	6.89	7.38	7.59	7.85	9.12	8.98
9	9.83	9.89	8.89	9.27	8.84	6.77	6.99	7.55	7.54	7.81	9.06	8.91
10	9.81	9.87	8.97	9.11	8.86	6.92	7.22	7.70	7.74	7.87	9.06	8.93
11	9.80	9.92	8.89	9.04	8.82	6.98	7.37	7.83	7.78	7.93	9.10	9.06
12	9.72	9.95	8.92	8.91	8.85	6.74	7.31	7.93	7.74	8.06	9.30	9.31
13	9.64	9.94	8.85	8.99	8.79	6.50	7.26	7.94	7.71	8.09	9.48	9.49
14	9.59	9.90	8.69	9.15	8.74	6.37	7.26	7.73	7.66	8.11	9.50	9.48
15	9.60	9.81	8.57	9.14	8.71	6.42	7.37	7.36	7.66	8.16	9.37	9.35
16	9.67	9.93	9.04	9.21	8.70	6.70	7.49	7.15	7.70	8.23	9.27	9.25
17	9.64	9.92	9.80	9.25	8.66	6.78	7.43	7.00	7.71	8.40	9.13	9.13
18	9.56	9.95	---	9.32	8.69	6.69	7.48	7.01	7.76	8.50	9.08	9.01
19	9.49	10.01	---	9.29	8.74	6.70	7.54	7.14	7.75	8.53	9.01	8.87
20	9.75	9.94	---	8.79	8.80	6.69	7.50	7.19	7.77	8.51	9.04	8.92
21	9.78	9.88	---	8.56	8.69	6.64	7.41	7.16	7.75	8.43	9.03	9.03
22	9.64	9.83	10.03	8.84	8.25	6.66	7.42	7.45	7.80	8.44	9.08	9.02
23	9.62	9.84	9.73	9.03	7.62	6.73	7.64	7.62	7.81	8.50	9.10	9.00
24	9.64	9.82	9.49	9.14	7.02	6.76	7.40	7.70	7.90	8.52	9.08	8.93
25	9.71	9.83	9.01	9.18	6.75	6.80	7.41	7.80	7.91	8.69	9.08	8.85
26	9.77	9.75	8.99	9.14	6.67	6.77	7.45	7.78	8.16	8.85	9.04	8.83
27	9.76	9.72	9.15	9.17	6.68	6.79	7.35	7.79	8.18	8.96	9.01	---
28	9.83	9.73	9.26	9.21	6.86	6.66	7.31	7.80	8.04	9.04	8.99	---
29	9.79	9.64	9.39	9.23	---	6.59	7.07	7.65	7.95	9.06	9.00	---
30	9.79	9.52	9.09	9.27	---	6.71	6.50	7.53	7.90	9.07	9.05	---
31	9.83	---	9.03	9.04	---	6.63	---	7.36	---	9.04	8.98	---
MEAN	9.73	9.83	---	9.14	8.45	6.77	7.25	7.40	7.74	8.34	9.12	---
MAX	9.83	10.01	---	9.51	9.21	7.34	7.64	7.94	8.18	9.07	9.50	---
MIN	9.49	9.52	---	8.56	6.67	6.37	6.50	6.80	7.32	7.81	8.98	---



## MISSOURI RIVER MAIN STEM

157

06467000 LEWIS AND CLARK LAKE NEAR YANKTON, SD

LOCATION.--Lat 42°50'56", long 97°28'54", in SW¼ sec.7, T.33 N., R.1 W., Cedar County, NE, Hydrologic Unit 10170101, in powerhouse of Gavins Point Dam on Missouri River, 3.75 mi southwest of Yankton, 13.6 mi upstream from James River, 32.5 mi downstream from Niobrara River, and at mile 811.0.

DRAINAGE AREA.--279,500 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1955 to current year (monthend contents only). Prior to October 1955, published as Gavins Point Reservoir near Yankton.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Dec. 9, 1955, recorder at temporary location on wall of intake structure unit 3.

REMARKS.--Reservoir is formed by earthfill dam; storage began in July 1955. Maximum capacity, 504,000 acre-ft below elevation 1,210.0 ft (top of spillway gates). Normal maximum, 442,600 acre-ft below elevation 1,208.0 ft. Inactive storage, 157,000 acre-ft below elevation 1,195.0 ft. Dead storage, 23,000 acre-ft below elevation 1,180.0 ft (crest of spillway). Figures given herein represent elevations at powerhouse and total contents adjusted for wind effect.

The spillway consists of 14 taintor gates, each 40 ft wide by 30 ft high; spillway capacity, 280,000 ft<sup>3</sup>/s at pool elevation 1,210.0 ft. Crest of spillway is at elevation 1,180.0 ft. Normal releases are through 3 power units, installation completed in January 1957; maximum release through power units is 35,000 ft<sup>3</sup>/s at pool elevation, 1,210.0 ft. Water is used for flood control, navigation, power, and incidental uses.

COOPERATION.--Records of elevation and contents provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 565,000 acre-ft Apr. 1, 1960, affected by wind; minimum since initial filling, 61,950 acre-ft Apr. 23, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 463,000 acre-ft Aug. 14 and Sept. 14; minimum, 339,000 acre-ft Apr. 1.

## MONTHEND ELEVATION AND CONTENTS AT 2400 HOURS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30 . . . . .	1,208.05	444,000	-
Oct. 31 . . . . .	1,208.31	446,000	+2,000
Nov. 30 . . . . .	1,207.70	435,000	-11,000
Dec. 31 . . . . .	1,207.77	435,000	0
CAL YR 1984 . . . . .	-	-	-4,000
Jan. 31 . . . . .	1,208.09	445,000	+10,000
Feb. 28 . . . . .	1,205.15	363,000	-82,000
Mar. 31 . . . . .	1,204.40	345,000	-18,000
Apr. 30 . . . . .	1,205.88	383,000	+38,000
May 31 . . . . .	1,205.30	369,000	-14,000
June 30 . . . . .	1,206.00	387,000	+18,000
July 31 . . . . .	1,207.94	442,000	+55,000
Aug. 31 . . . . .	1,207.90	440,000	-2,000
Sept. 30 . . . . .	1,208.28	451,000	+11,000
WTR YR 1985 . . . . .	-	-	+7,000

NOTE.--Reservoir frozen over Dec. 17 to Mar. 22.

## MISSOURI RIVER MAIN STEM

06467500 MISSOURI RIVER AT YANKTON, SD

LOCATION.--Lat 42°51'58", long 97°23'37", in SW¼SW¼ sec.18, T.93 N., R.55 W., Yankton County, Hydrologic Unit 10170101, near left bank in downstream end of left pier of Meridian Highway Bridge on U.S. Highway 81, 5.2 mi downstream from Gavins Point Dam, 6.0 mi upstream from James River, and at mile 805.8.

DRAINAGE AREA.--279,500 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1309. Gage-height records collected at same site March 1873 to November 1886, March 1905 to May 1908 (fragmentary), August 1921 to September 1950 (except winter months prior to 1932), are contained in reports of the National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 1,139.68 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 20, 1932, nonrecording gage, and Sept. 20, 1932, to Mar. 9, 1967, water-stage recorder at present site and at datum 20.0 ft higher.

REMARKS.--Records good except those for winter period, Jan. 19 to Mar. 6, which are poor. Flow completely regulated by Gavins Point Dam 5.2 mi upstream since July 1955. Many diversions for irrigation and water supply above station. U.S. Army Corps of Engineers gage-height telemeter and satellite data-collection platform at station. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--55 years, 26,540 ft<sup>3</sup>/s (19,230,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 480,000 ft<sup>3</sup>/s Apr. 13, 1952; maximum gage height, 35.5 ft Apr. 13, 14, 1952 (present datum); minimum daily discharge, 2,700 ft<sup>3</sup>/s Nov. 15, 16, 1940.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known, 50.5 ft Apr. 5, 1881 (ice jam), present datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 48,000 ft<sup>3</sup>/s at 0730 hours, Oct. 25 (gage height, 18.93 ft); minimum daily discharge, 7,680 ft<sup>3</sup>/s Apr. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46900	47400	45400	20500	21000	21000	23200	22800	31800	32700	33400	33300
2	46400	47600	42100	20300	21000	21000	23100	24000	31800	32700	33400	33400
3	46000	47600	38200	20200	21000	21000	24000	24500	31100	32700	33500	33400
4	46200	47400	34200	20100	21000	21000	23800	25400	29400	32700	33400	33500
5	46200	47400	33100	20100	21000	21000	23400	26600	29500	32700	33400	33100
6	46200	47400	31100	20000	21000	21000	23300	27900	31000	32700	33400	32400
7	46000	47400	27500	20200	21000	21000	23800	28600	32000	32800	33500	32200
8	46000	47600	24400	20400	21000	20900	23900	29100	31800	32900	33500	31800
9	46200	47600	23600	20400	21000	21000	24500	30100	31900	32700	33300	31100
10	46200	47400	23300	20200	21000	20800	25500	30200	31900	32700	33400	31300
11	46200	47600	23000	20800	21000	20700	26200	30700	31700	32700	33500	31800
12	46100	47500	23100	21100	21000	20200	26100	30900	31600	32800	33300	32200
13	46100	47500	23300	20700	21000	20000	26500	30800	31900	32600	32800	31700
14	46000	47400	23400	20800	21000	20100	27300	29500	32400	32600	32800	30900
15	45900	47400	23300	20800	21000	20400	27800	27600	32700	32800	32800	31300
16	46000	47600	23100	20400	21000	20400	28700	26200	32300	33500	33000	30900
17	45900	47600	23200	20300	21000	20400	28600	27100	31600	34000	32600	30000
18	46300	47600	23300	20400	21000	20400	29200	28600	31900	34400	32600	30900
19	46600	47700	22600	21000	21000	20500	29600	28600	32100	34300	32700	31400
20	46600	47600	21600	21000	21000	20200	30200	29100	32700	32700	33000	31500
21	46600	47400	20500	21000	21000	20200	30500	29600	32600	32700	32900	31600
22	46600	47300	19900	21000	21000	20100	29200	29800	32700	33200	32800	31500
23	47600	47300	19600	21000	21000	19900	23100	30700	32900	33300	32900	31700
24	47600	47400	19900	21000	21000	19800	12000	31800	33000	33200	32800	31700
25	47700	47500	20100	21000	21000	20000	7740	31900	33000	33200	32900	31400
26	47700	47400	19900	21000	21000	19800	7710	31900	32800	33300	32900	31400
27	47600	47300	19800	21000	21000	19800	7680	32000	32600	33300	33100	31500
28	47700	47400	19700	21000	21000	20000	7860	32000	32700	33400	33100	31900
29	47600	47300	20400	21000	---	20600	12400	31800	32700	33400	32400	31900
30	47600	47400	20200	21000	---	21700	21300	31800	32700	33500	31200	31900
31	47800	---	20000	21000	---	22200	---	31600	---	33400	32200	---
TOTAL	1446100	1424000	772800	640700	588000	637100	678190	903200	960800	1025600	1022500	954600
MEAN	46650	47470	24930	20670	21000	20550	22610	29140	32030	33080	32980	31820
MAX	47800	47700	45400	21100	21000	22200	30500	32000	33000	34400	33500	33500
MIN	45900	47300	19600	20000	21000	19800	7680	22800	29400	32600	31200	30000
AC-FT	286800	2825000	1533000	1271000	1166000	1264000	1345000	1791000	1906000	2034000	2028000	1893000
CAL YR 1984	TOTAL	11049000		MEAN	30190	MAX	47800	MIN	10000	AC-FT	21916000	
WTR YR 1985	TOTAL	11053590		MEAN	30280	MAX	47800	MIN	7680	AC-FT	21925000	

## JAMES RIVER BASIN

159

06470985 MUD LAKE NEAR HOUGHTON, SD

LOCATION.--Lat 45°46'36", long 98°14'45", in NW¼NW¼ sec.36, T.127 N., R.62 W., Brown County, Hydrologic Unit 10160003, 1.5 mi northwest of Houghton.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June to September 1985.

pH: June to September 1985.

WATER TEMPERATURE: June to September 1985.

DISSOLVED OXYGEN: June to September 1985.

REMARKS.--Specific conductance, pH, water temperature, and dissolved oxygen were sampled at hourly intervals using a mini-monitor.

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25°C, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	790	770	777	820	760	798						
2	790	780	784	820	770	800						
3	800	780	787	810	750	786						
4	800	780	790	790	710	750						
5	790	780	786	790	750	771						
6	800	780	792	800	770	785						
7	800	790	795	790	740	774						
8	810	780	793	780	730	763						
9	810	790	801	780	710	750						
10	810	780	798	780	740	761						
11	800	760	785	780	740	764						
12	800	770	790	790	730	766						
13	790	770	780	770	730	755						
14	800	770	787	750	690	721	960	950	953			
15	810	780	791	750	720	741	980	940	954			
16	800	760	783	760	730	745	960	910	943			
17	800	760	789	760	730	746	950	890	918			
18	820	790	808	760	730	743	940	900	925			
19	830	810	819	760	730	748	950	910	930			
20	820	800	813	760	720	745	960	930	948			
21	820	790	807	750	710	735	970	950	959			
22	830	810	820	760	700	733	980	950	964			
23	840	820	826				960	910	947			
24	830	790	811	770	730	745	970	940	954	1060	1050	1050
25	830	800	818	760	720	747	980	950	963	1060	1050	1060
26	840	810	825	770	740	755	1000	950	974	1060	1040	1050
27	820	800	810	780	750	763	1010	950	960	1060	1050	1060
28	820	790	806	780	750	769	960	900	945	1070	1060	1060
29	820	780	809	810	750	781	970	900	943	1070	1050	1060
30	820	790	803	810	700	775				1060	1050	1060
31				820	690	784						

## JAMES RIVER BASIN

06470985 MUD LAKE NEAR HOUGHTON, SD--Continued

PH, IN STANDARD UNITS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.8	8.6	8.7	9.0	8.9	9.0	9.1	8.7	8.9	9.2	9.1	9.2
2	8.7	8.6	8.7	9.0	8.9	9.0	9.2	8.9	9.1	9.2	8.9	9.1
3	8.8	8.7	8.7	9.1	8.8	9.0	9.1	8.9	9.0	9.2	8.8	9.1
4	8.9	8.7	8.8	9.3	8.9	9.1	9.1	8.9	9.0	9.2	8.8	9.0
5	8.9	8.7	8.8	9.2	9.0	9.1	9.1	8.9	9.0			
6	8.9	8.8	8.9	9.1	8.9	9.0	9.2	9.0	9.1			
7	9.1	8.8	8.9	9.1	8.9	9.0	9.2	9.0	9.1			
8	9.1	8.8	9.0	9.2	9.0	9.0	9.2	8.5	8.9			
9	9.1	8.9	9.0	9.1	8.9	9.0	9.2	9.0	9.0			
10	9.0	8.9	9.0	9.0	9.0	9.0	9.1	8.9	9.0			
11	9.1	8.9	9.0	9.1	9.0	9.0	9.2	8.8	9.0			
12	9.0	8.8	8.9	9.1	9.0	9.0	9.1	8.9	9.0			
13	9.1	8.8	9.0	9.1	8.9	9.0	9.1	8.9	9.0			
14	9.2	9.0	9.0	9.2	9.0	9.1	9.2	9.0	9.1			
15	9.1	9.0	9.1	9.2	9.0	9.1	9.2	9.0	9.1			
16	9.2	9.0	9.1	9.1	9.0	9.1	9.2	9.0	9.1			
17	9.2	9.0	9.1	9.0	8.9	9.0	9.2	9.0	9.1			
18	9.0	8.7	8.8	9.2	8.9	9.0	9.2	9.0	9.1			
19	8.8	8.6	8.7	9.1	9.0	9.1	9.2	9.1	9.1			
20	8.9	8.7	8.8	9.0	8.9	9.0	9.2	9.1	9.1			
21	8.9	8.7	8.8	9.2	9.0	9.1	9.2	9.0	9.1			
22	8.8	8.7	8.8	9.1	9.0	9.1	9.2	9.0	9.1			
23	9.0	8.8	8.9	9.1	9.0	9.0	9.2	9.1	9.1			
24	9.0	8.9	8.9	9.0	8.9	9.0	9.2	9.0	9.1			
25	8.9	8.8	8.9	9.2	8.9	9.0	9.2	9.0	9.1	9.2	9.2	9.2
26	8.9	8.9	8.9	9.2	9.0	9.1	9.2	9.0	9.2	9.2	9.0	9.1
27	8.9	8.8	8.9	9.2	8.9	9.0	9.2	9.0	9.1	9.2	9.1	9.1
28	9.0	8.9	8.9	9.2	9.0	9.1	9.2	9.1	9.1	9.2	9.1	9.1
29	9.1	8.9	9.0	9.1	8.9	9.0	9.2	9.0	9.1	9.1	9.1	9.1
30	9.0	8.9	9.0	9.1	8.8	9.0	9.2	9.0	9.1	9.1	9.0	9.1
31				9.0	8.8	8.9	9.2	9.0	9.1			

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	19.0	16.0	17.0	22.5	19.5	20.5				25.5	19.5	22.0
2	16.0	14.5	15.0	21.5	20.0	21.0				23.0	19.5	21.0
3	14.5	13.5	14.0	24.5	20.0	22.0				23.5	19.5	21.0
4	18.0	13.0	15.5	23.5	20.5	22.0				24.0	20.0	22.0
5	16.5	15.0	16.0	26.5	19.0	22.5				23.5	20.5	22.0
6	19.5	16.0	17.5	24.0	22.0	22.5				24.5	20.0	22.0
7	25.0	19.0	21.5	25.5	21.5	23.5				23.0	19.0	21.0
8	23.5	20.0	22.0	27.0	22.5	24.0				19.0	14.0	15.5
9	22.0	18.5	20.5	25.0	20.5	23.0				17.5	13.0	15.0
10	21.5	18.5	19.5	25.0	21.0	22.5				16.5	14.5	15.5
11	18.5	15.5	17.5	23.5	20.0	22.0						
12	15.5	14.0	15.0	29.5	20.5	24.5						
13	17.0	15.0	16.0	27.0	23.5	25.0						
14	21.0	16.5	18.0	24.5	22.0	23.0	21.0	16.0	20.0			
15	22.5	17.5	20.0	26.0	20.0	23.0	21.5	18.0	19.5			
16	22.5	20.0	21.0	24.0	21.0	23.0	21.0	18.0	19.5			
17	19.5	15.5	17.0	23.0	21.5	22.0	20.0	17.5	18.5			
18	18.0	14.5	16.0	27.0	21.5	23.5	21.5	15.5	18.5			
19	18.0	15.5	16.0	26.0	20.5	23.0	21.0	15.5	18.5			
20	20.0	15.5	17.0	23.5	21.5	22.5	18.5	16.5	17.5			
21	20.0	17.5	19.0	26.0	20.5	23.0	20.5	17.0	19.0			
22	19.5	16.0	17.5	24.0	21.5	23.0	25.0	19.0	21.5			
23	22.0	16.5	19.0	24.5	20.5	22.5	22.0	19.5	21.0			
24	21.5	17.5	19.0	23.0	21.0	22.0	20.0	17.5	18.5	11.0	8.5	10.0
25	23.0	20.0	21.5	26.5	21.0	23.5	22.5	17.0	20.0	11.5	8.0	9.5
26	20.5	18.5	19.5	25.0	21.0	23.0	23.5	18.5	20.5	10.5	7.5	9.0
27	18.0	16.5	17.0	25.5	21.0	23.0	21.5	19.5	20.5	9.5	7.5	8.5
28	17.0	16.0	16.5	24.5	20.0	22.5	21.0	18.5	19.5	8.0	6.0	7.0
29	22.5	16.0	17.5	23.0	19.5	21.5	20.0	18.0	19.0	7.5	5.5	6.5
30	21.0	18.5	19.5	20.5	18.0	19.5	22.5	18.5	20.0	6.5	5.0	6.0
31				20.0	17.0	18.5	25.0	20.5	22.0			

## JAMES RIVER BASIN

161

06470985 MUD LAKE NEAR HOUGHTON, SD--Continued

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	9.5	7.8	8.8									
2	8.9	7.8	8.2									
3	9.5	7.5	8.3									
4	11.2	8.5	9.7									
5	10.3	8.5	9.5									
6	9.9	8.8	9.3									
7	11.6	7.9	9.7									
8	10.1	7.3	8.4									
9	10.5	7.1	8.9									
10	9.7	8.1	8.8									
11	9.6	7.3	8.5									
12	9.6	7.5	8.6									
13	10.7	7.7	9.4									
14	11.2	8.5	9.6									
15	11.4	7.7	9.0									
16	9.3	7.3	8.5									
17	12.7	6.9	8.2									
18	8.9	7.1	7.8									
19												
20												
21												
22												
23												
24												
25												
26												
27												
28							10.0	7.1	8.5			
29							12.7	7.6	10.4			
30							14.8	3.4	9.0			
31							14.0	6.2	10.5			



## JAMES RIVER BASIN

06470992 SAND LAKE NEAR COLUMBIA, SD

LOCATION.--Lat 45°40'10", long 98°18'31", in NW¼SW¼ sec.4, T.125 N., R.62 W., Brown County, Hydrologic Unit 10160003, near outlet control structure 3 mi north of Columbia.

PERIOD OF RECORD.--May to September 1985.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May to September 1985.

pH: May to September 1985.

WATER TEMPERATURE: May to September 1985.

DISSOLVED OXYGEN: May to September 1985.

REMARKS.--Specific conductance, pH, water temperature, and dissolved oxygen were sampled at hourly intervals using a mini-monitor.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	ALDRIN, DIS- SOLVED (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, DIS- SOLVED (UG/L)	CHLOR- DANE, TOTAL (UG/L)
AUG 1985 27...	14:30	860	8.3	21.0	21.0	732	5.2	61	<0.01	<0.01	<0.1	<0.1
DATE	DDD, DIS- SOLVED (UG/L)	DDD, TOTAL (UG/L)	DDE, DIS- SOLVED (UG/L)	DDE, TOTAL (UG/L)	DDT, DIS- SOLVED (UG/L)	DDT, TOTAL (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- AZINON, TOTAL (UG/L)	DI- ELDRIN, DIS- SOLVED (UG/L)	DI- ELDRIN, TOTAL (UG/L)	ENDO- SULFAN, TOTAL (UG/L)	
AUG 1985 27...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
DATE	ENDO- SULFAN DISSOLV (UG/L)	ENDRIN, DIS- SOLVED (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION DISSOLV (UG/L)	ETHION, TOTAL (UG/L)	PCB, DIS- SOLVED (UG/L)	PCB, TOTAL (UG/L)	NAPH- THA- LENES, POLY- CHLOR. TOTAL (UG/L)	PCN DISSOLV (UG/L)	HEPTA- CHLOR EPOXIDE DIS- SOLVED (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	
AUG 1985 27...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1	<0.01	<0.01	
DATE	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR, DIS- SOLVED (UG/L)	LINDANE DIS- SOLVED (UG/L)	LINDANE TOTAL (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	MALA- THION, TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	METH- OXY- CHLOR DISSOLV (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	METHYL PARA- THION, DIS- SOLVED (UG/L)	METHYL- THION DISSOLV (UG/L)	
AUG 1985 27...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
DATE	METHYL TRI- THION, TOTAL (UG/L)	MIREX, DIS- SOLVED (UG/L)	MIREX, TOTAL (UG/L)	PARA- THION, DIS- SOLVED (UG/L)	PARA- THION, TOTAL (UG/L)	PER- THANE DISSOLV (UG/L)	PER- THANE TOTAL (UG/L)	TOX- APHENE, DIS- SOLVED (UG/L)	TOX- APHENE, TOTAL (UG/L)	TRI- THION DISSOLV (UG/L)	TOTAL TRI- THION (UG/L)	
AUG 1985 27...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<1.0	<1	<0.01	<0.01	

## JAMES RIVER BASIN

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06470992 SAND LAKE NEAR COLUMBIA, SD--Continued

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25° CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
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										830	820	827
30										830	800	815
31										810	780	795
	JUNE			JULY			AUGUST			SEPTEMBER		
1	800	790	793	790	770	780	750	730	739	920	880	901
2	810	790	800	790	770	783	750	730	743	920	870	892
3	800	780	791	810	790	797	760	740	748	910	860	885
4	800	780	795	810	780	794	760	730	748	920	870	889
5	810	780	792	790	770	783	770	740	757	900	880	888
6	810	790	800	780	760	774	770	730	755	910	880	895
7	820	790	802	800	760	777	760	730	748	900	870	888
8	830	810	819	780	760	769	760	740	750	880	860	871
9	840	800	816	780	750	768	760	750	753	890	860	871
10	820	780	804	790	750	769	760	750	755	870	850	868
11	790	760	773	770	750	759	780	740	762	900	860	879
12	780	750	763	770	760	766	770	740	759	890	830	872
13	790	760	771	790	760	770	780	750	763	880	870	871
14	790	770	781	810	760	790	800	760	779	880	870	874
15	800	760	784	800	750	783	800	780	792	900	880	885
16	810	780	795	780	750	763	800	780	795	930	880	903
17	790	770	782	770	750	765	820	780	806	930	900	908
18	810	770	783	780	750	766	830	810	817	930	910	920
19	810	780	794	770	740	753	830	820	825	930	880	913
20	810	790	802	760	740	750	840	810	829	930	870	913
21	820	790	805	750	730	738	850	830	838	940	890	927
22	810	790	800	760	730	745	860	840	850	940	900	934
23	800	790	793	760	730	743	860	840	848	970	900	946
24	820	780	802	750	720	737	860	830	845	980	940	958
25	820	810	817	750	720	735	870	840	859	980	940	956
26	820	800	813	740	720	730	880	860	872	980	940	961
27	800	770	780	740	720	730	880	850	868	1000	960	973
28	780	760	771	740	720	730	900	850	863	990	940	967
29	780	770	775	740	720	728	890	850	871	990	950	966
30	780	770	777	740	720	735	890	860	879	980	950	965
31				750	730	736	930	870	903			

## JAMES RIVER BASIN

06470992 SAND LAKE NEAR COLUMBIA, SD--Continued

PH, IN STANDARD UNITS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
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										8.3	8.1	8.2
30										8.3	8.2	8.3
31										8.5	8.3	8.3
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.5	8.3	8.4	8.7	8.6	8.6	9.5	9.4	9.5	8.5	8.3	8.3
2	8.5	8.3	8.4	8.8	8.6	8.7	9.5	9.4	9.4			
3	8.4	8.2	8.3	8.9	8.6	8.7	9.5	9.4	9.4			
4	8.4	8.2	8.3	9.0	8.6	8.9	9.5	9.4	9.4			
5	8.4	8.3	8.4	9.0	8.8	8.9	9.5	9.4	9.5			
6	8.5	8.3	8.4	9.1	8.9	8.9	9.5	9.4	9.5			
7	8.5	8.3	8.4	9.2	8.9	9.0	9.5	9.4	9.4			
8	8.5	8.3	8.4	9.2	9.0	9.0	9.5	9.4	9.4			
9	8.6	8.3	8.5	9.2	9.0	9.1	9.5	9.4	9.4			
10	8.5	8.4	8.5	9.3	9.0	9.2	9.5	9.3	9.4			
11	8.7	8.3	8.5	9.3	9.1	9.2	9.5	9.4	9.5			
12	8.7	8.4	8.5	9.3	9.2	9.2	9.5	9.4	9.4			
13	8.7	8.5	8.6	9.2	9.1	9.1	9.4	9.3	9.4			
14	8.8	8.4	8.5	9.3	9.1	9.2	9.4	9.2	9.3			
15	8.7	8.5	8.6	9.3	9.2	9.2	9.4	9.2	9.3			
16	8.7	8.5	8.6	9.3	9.2	9.3	9.3	9.2	9.3			
17	8.8	8.4	8.6	9.4	9.3	9.3	9.3	9.2	9.2			
18	8.8	8.1	8.6	9.4	9.2	9.3	9.2	9.0	9.1			
19	8.5	8.4	8.5	9.4	9.3	9.3	9.1	8.9	9.0			
20	8.6	8.4	8.5	9.5	9.3	9.4	9.0	8.9	9.0			
21	8.6	8.4	8.5	9.5	9.4	9.4	8.9	8.8	8.9			
22	8.5	8.1	8.3	9.5	9.3	9.4	8.9	8.7	8.8			
23	8.7	8.5	8.6	9.5	9.4	9.4	8.8	8.6	8.7			
24	8.7	8.6	8.6	9.5	9.4	9.5	8.6	8.5	8.5	8.6	8.3	8.4
25	8.6	8.4	8.5	9.5	9.4	9.4	8.5	8.4	8.4	8.5	8.3	8.4
26	8.6	8.2	8.4	9.5	9.4	9.4	8.5	8.4	8.4	8.5	8.3	8.4
27	8.6	8.4	8.5	9.6	9.4	9.5	8.6	8.4	8.5	8.5	8.3	8.4
28	8.7	8.4	8.6	9.5	9.4	9.5	8.6	8.4	8.5	8.5	8.3	8.4
29	8.7	8.5	8.6	9.5	9.5	9.5	8.5	8.3	8.4	8.5	8.2	8.3
30	8.6	8.5	8.6	9.6	9.5	9.6	8.5	8.2	8.3	8.5	8.2	8.3
31				9.5	9.4	9.5	8.4	8.2	8.3			

## JAMES RIVER BASIN

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06470992 SAND LAKE NEAR COLUMBIA, SD--Continued

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
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										21.5	19.0	21.0
30										21.5	18.5	20.5
31										20.0	17.0	18.5
	JUNE			JULY			AUGUST			SEPTEMBER		
1	19.5	18.0	18.5	21.0	20.0	20.5	20.0	19.0	19.5	23.5	20.5	22.0
2	18.0	16.5	17.0	22.0	20.5	21.0	20.5	19.5	19.5	22.5	20.5	21.0
3	17.0	15.5	16.0	24.5	21.5	22.0	21.0	20.0	20.5	23.0	20.0	21.0
4	18.0	14.5	16.0	23.5	22.0	23.0	21.0	20.0	20.5	24.0	21.5	22.5
5	18.0	16.0	17.0	23.0	21.5	22.0	21.0	20.5	21.0	23.5	21.0	22.0
6	20.5	17.0	18.5	23.5	22.0	22.5	24.0	21.0	22.0	24.0	21.5	22.5
7	22.5	19.5	20.5	23.0	22.0	22.5	22.0	21.5	21.5	23.0	20.0	21.5
8	23.0	22.0	22.5	23.5	23.0	23.0	24.0	22.0	22.5	21.0	14.5	16.5
9	22.5	20.0	21.5	25.0	22.5	23.5	25.0	20.5	22.5	17.0	13.5	15.0
10	22.0	19.0	20.5	25.5	23.0	23.5	20.0	18.0	19.0	16.5	15.0	15.5
11	19.0	17.0	18.5	24.0	22.0	23.0	19.5	17.5	18.5	17.5	15.0	16.0
12	19.5	15.5	17.0	23.0	22.0	22.5	19.5	19.0	19.0	17.0	15.0	16.0
13	19.0	17.5	18.5	23.5	23.0	23.0	19.0	17.5	18.5	15.0	14.0	14.0
14	21.5	18.5	19.5	23.5	22.5	23.0	18.0	17.0	17.5	14.5	13.0	13.5
15	22.5	20.0	21.0	22.5	21.0	21.5	19.0	17.5	18.0	17.5	14.5	15.5
16	23.0	21.5	22.0	22.5	21.0	21.5	20.5	18.0	19.0	19.5	16.5	18.0
17	22.0	17.0	19.0	23.0	22.0	22.0	19.5	18.0	18.5	21.0	18.5	19.5
18	19.0	16.0	17.0	23.5	22.5	23.0	19.0	17.0	18.0	22.0	20.0	21.0
19	19.0	17.5	18.0	23.0	21.5	22.0	19.0	17.5	18.0	21.5	15.5	18.5
20	21.0	18.5	19.5	22.5	21.5	22.0	18.5	17.5	18.0	15.5	13.5	14.5
21	21.5	19.0	20.5	22.5	21.0	22.0	20.5	17.5	18.5	14.5	12.0	13.5
22	21.0	18.0	19.0	22.5	21.5	22.0	22.5	19.0	20.0	14.0	13.0	13.5
23	21.5	18.5	20.0	22.5	21.0	21.5	21.5	20.5	21.0	13.5	11.0	11.5
24	23.0	19.0	21.0	23.0	22.0	22.0	20.0	19.0	19.0	11.0	9.5	10.0
25	23.5	22.0	22.5	22.5	21.5	22.0	20.0	18.0	19.0	10.5	9.5	10.0
26	21.5	20.5	21.0	23.5	21.5	22.0	21.0	19.0	20.0	10.5	8.0	9.5
27	20.0	18.0	18.5	22.5	21.5	22.0	22.5	20.5	21.0	10.0	8.5	9.0
28	18.0	17.0	17.5	23.0	21.5	22.0	22.0	19.5	21.0	8.0	7.0	7.5
29	18.5	17.0	17.5	22.5	21.0	21.5	21.0	19.5	20.0	8.0	6.5	7.5
30	20.0	18.0	19.0	21.5	20.0	20.5	22.5	19.5	20.5	7.5	6.0	7.0
31				20.5	19.0	19.5	23.5	20.5	22.0			

## JAMES RIVER BASIN

06470992 SAND LAKE NEAR COLUMBIA, SD--Continued

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
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										6.1	4.4	5.1
30										5.8	3.4	4.4
31										6.9	3.4	5.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.5	4.0	6.0	8.3	6.4	7.3				4.8	.2	1.7
2	7.0	3.9	5.0	10.4	5.1	7.4				2.6	.4	1.1
3	5.2	2.9	4.2	18.8	7.3	10.9				1.0	.1	.4
4	6.9	3.5	5.0							3.2	.2	1.0
5										2.7	.2	1.2
6										3.8	.0	1.5
7										4.2	.7	2.3
8										4.4	2.3	3.2
9										4.9	1.4	2.9
10										4.3	2.1	2.8
11										3.5	.2	1.7
12										2.9	1.3	2.1
13										2.3	.8	1.6
14										3.9	.7	1.9
15										12.5	3.8	8.3
16												
17												
18												
19	10.5	7.2	9.0									
20	11.6	8.7	10.2									
21	10.6	6.4	8.5									
22	9.9	1.4	5.7									
23	11.6	7.3	9.3									
24	11.4	9.3	10.5									
25	9.0	4.5	6.0									
26	7.5	.5	4.6									
27	6.7	2.1	4.5									
28	7.3	4.3	5.3				6.4	2.4	4.2			
29	7.4	4.7	5.5				4.9	1.6	3.0			
30	8.7	3.7	6.5				5.8	.4	2.6			
31							5.5	.4	2.5			



06471000 JAMES RIVER AT COLUMBIA, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 45°36'13", long 98°18'36", in NW¼NW¼ sec.33, T.125 N., R.62 W., Brown County, Hydrologic Unit 10160003, on left bank 20 ft downstream from highway bridge, 0.6 mi south of Columbia, 0.9 mi downstream from Chicago and North Western Transportation Company bridge, 0.3 mi upstream from Elm River, and 12.7 mi downstream from Columbia Road Dam.

DRAINAGE AREA.--5,840 mi<sup>2</sup>, approximately, of which about 3,320 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,270 ft above National Geodetic Vertical Datum of 1929, from topographic map. From Oct. 1, 1945, to Oct. 4, 1957, nonrecording gage. From Oct. 5, 1957, to Sept. 30, 1980, water-stage recorder. Both gages described above at site 3.3 mi upstream from present site and at different datum.

REMARKS.--Records good except those for winter periods and/or backwater from beaver dam, Nov. 29 to Mar. 25 and May 30 to July 6, which are poor. Flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973. Gage-height telemeter at station.

AVERAGE DISCHARGE.--40 years, 111 ft<sup>3</sup>/s (80,420 acre-ft/yr); median of yearly mean discharges, 67 ft<sup>3</sup>/s (48,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,420 ft<sup>3</sup>/s May 24, 25, 1950 (gage height, 16.89 ft), from graph based on gage readings; maximum gage height, 17.09 ft Apr. 22, 1969; maximum daily reverse flow, 1,860 ft<sup>3</sup>/s Apr. 8, 1952, backwater from Elm River.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 179 ft<sup>3</sup>/s at 1700 hours, Apr. 6 (gage height, 7.11 ft); maximum gage height observed, 7.75 ft Mar. 16 (backwater from ice); no flow June 17 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	91	70	9.0	5.5	19	164	49	5.5	.00	.00	.00
2	32	116	60	9.0	5.0	19	165	34	5.0	.00	.00	.00
3	31	130	40	10	5.5	18	164	25	4.0	.00	.00	.00
4	28	132	35	10	5.5	18	167	24	3.0	.00	.00	.00
5	28	126	30	11	6.0	17	175	22	2.0	.00	.00	.00
6	22	121	27	11	6.5	17	177	22	1.0	.00	.00	.00
7	21	122	29	10	6.5	18	176	16	.80	.00	.00	.00
8	21	122	29	9.0	7.0	19	174	9.1	.60	.00	.00	.00
9	19	120	30	8.5	7.5	20	171	6.8	.50	.00	.00	.00
10	19	111	28	8.5	8.0	20	156	6.3	.40	.00	.00	.00
11	26	129	25	9.0	8.0	20	132	4.7	.30	.00	.00	.00
12	31	140	22	10	8.5	21	124	4.6	.25	.00	.00	.00
13	33	138	20	11	9.0	21	109	3.0	.20	.00	.00	.00
14	34	127	21	10	10	22	95	2.3	.10	.00	.00	.00
15	39	90	22	11	11	22	89	3.4	.05	.00	.00	.00
16	46	85	20	11	12	24	86	19	.01	.00	.00	.00
17	57	127	17	10	13	30	86	30	.00	.00	.00	.00
18	66	128	14	8.0	14	50	85	28	.00	.00	.00	.00
19	78	132	14	7.0	15	60	84	25	.00	.00	.00	.00
20	82	133	15	8.0	16	55	85	23	.00	.00	.00	.00
21	89	134	15	9.0	16	50	84	20	.00	.00	.00	.00
22	96	139	14	9.0	17	50	84	16	.00	.00	.00	.00
23	99	137	13	9.5	18	45	84	12	.00	.00	.00	.00
24	100	130	11	10	19	50	83	9.3	.00	.00	.00	.00
25	101	120	12	10	19	45	80	8.1	.00	.00	.00	.00
26	103	115	13	9.5	18	42	80	7.3	.00	.00	.00	.00
27	105	106	14	9.0	19	42	67	6.6	.00	.00	.00	.00
28	103	80	14	8.0	20	120	57	6.3	.00	.00	.00	.00
29	104	75	12	7.0	---	147	53	5.4	.00	.00	.00	.00
30	107	75	10	6.5	---	152	52	5.0	.00	.00	.00	.00
31	108	---	9.5	5.5	---	156	---	5.0	---	.00	.00	---
TOTAL	1859	3531	705.5	284.0	325.5	1409	3388	458.2	23.71	.00	.00	.00
MEAN	60.0	118	22.8	9.16	11.6	45.5	113	14.8	.79	.00	.00	.00
MAX	108	140	70	11	20	156	177	49	5.5	.00	.00	.00
MIN	19	75	9.5	5.5	5.0	17	52	2.3	.00	.00	.00	.00
AC-FT	369	7000	1400	563	646	2790	6720	909	47	.00	.00	.00
CAL YR 1984	TOTAL	71770		MEAN	196	MAX	1080	MIN	-515	AC-FT	142400	
WTR YR 1985	TOTAL	11983.91		MEAN	32.8	MAX	177	MIN	.00	AC-FT	23770	

06471000 JAMES RIVER AT COLUMBIA, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1948 to September 1964, October 1966 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1966 to September 1981.

WATER TEMPERATURE: October 1966 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,500 microsiemens, Mar. 1, 1974, Jan. 27-29, Jan. 31, 1979; minimum daily, 240 microsiemens, Mar. 17, 1972.

WATER TEMPERATURE: Maximum daily, 32.0°C, June 29, July 10, 1970; minimum daily, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUC- TANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	
DATE	TIME												
NOV 1984													
27...	1300	102	795	7.6	-4.0	1.0	12	730	--	--	K37	K35	
JAN 1985													
04...	1500	11	1140	7.3	6.0	.5	10	742	2.6	19	90	K23	
FEB													
05...	1500	6.0	840	7.8	-19.0	.0	8.6	729	14.2	102	--	--	
28...	1550	20	1080	7.8	12.5	.5	5.4	727	2.6	19	--	--	
MAR													
28...	0920	117	837	8.1	3.5	2.0	21	--	12.8	--	K10	K17	
APR													
24...	1330	84	780	8.1	20.0	13.0	9.3	743	10.3	101	--	--	
MAY													
23...	1015	13	780	8.8	20.0	18.0	3.0	753	--	--	K92	--	
		HARD- NESS NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	
DATE													
NOV 1984													
27...	270	52	55	33	73	35	2	16	222	140	24	.20	
JAN 1985													
04...	410	4	82	49	110	36	2	21	403	220	36	.20	
FEB													
05...	520	23	110	60	120	32	2	24	499	260	47	--	
28...	380	17	79	44	92	33	2	18	362	200	35	--	
MAR													
28...	300	35	61	36	76	34	2	17	266	160	27	.20	
APR													
24...	260	27	54	31	67	34	2	14	236	130	29	--	
MAY													
23...	260	32	45	35	77	38	2	16	225	140	32	.20	
		SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
DATE													
NOV 1984													
27...	10	522	480	.71	144	.39	.080	.10	1.7	.100	--	.280	
JAN 1985													
04...	18	812	780	1.1	24	<.10	.500	.64	2.5	.190	--	.110	
FEB													
05...	25	990	950	1.3	16	<.10	--	--	--	--	--	.240	
28...	16	718	700	.98	39	<.10	--	--	--	--	--	.180	
MAR													
28...	8.2	553	550	.75	175	<.10	.050	.06	2.4	.220	--	.160	
APR													
24...	5.8	488	470	.66	111	<.10	--	--	--	--	--	.280	
MAY													
23...	2.6	493	480	.67	17	<.10	.040	.05	1.2	.140	.43	.120	

## JAMES RIVER BASIN

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06471000 JAMES RIVER AT COLUMBIA, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
NOV 1984												
27...	.010	<10	1	82	<.5	<1	<1	<3	6	20	<1	52
JAN 1985												
04...	.100	--	--	--	--	--	--	--	--	--	--	--
FEB												
05...	--	--	--	--	--	--	--	--	5	190	4	--
28...	--	--	--	--	--	--	--	--	2	36	<1	--
MAR												
28...	.020	<10	1	98	<.5	<1	<1	<3	3	25	4	52
APR												
24...	--	--	--	--	--	--	--	--	6	27	12	--
MAY												
23...	.030	20	4	48	1.1	1	<1	<3	22	38	4	54
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 1984												
27...	130	<.1	<10	<1	<1	<1	280	<6	13	--	--	--
JAN 1985												
04...	--	--	--	--	--	--	--	--	--	207	6.1	83
FEB												
05...	3	<.1	--	--	<1	--	--	--	26	256	4.1	53
28...	3300	<.1	--	--	<1	--	--	--	14	175	9.5	90
MAR												
28...	590	.4	<10	6	<1	<1	290	<6	<3	--	--	--
APR												
24...	290	<.1	--	--	<1	--	--	--	18	68	15	98
MAY												
23...	63	<.1	<10	4	<1	<1	260	<6	7	--	--	--

## JAMES RIVER BASIN

## 06471200 MAPLE RIVER AT NORTH DAKOTA-SOUTH DAKOTA STATE LINE

LOCATION.--Lat 45°56'20", long 98°27'08", in SW¼SE¼ sec.33, T.129 N., R.62 W., Dickey County, ND, Hydrologic Unit 10160004, on left bank 0.4 mi upstream from State line, 7.8 mi northeast of Frederick, SD, and 15.7 mi upstream from mouth.

DRAINAGE AREA.--750 mi<sup>2</sup>, approximately, of which about 270 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--June 1956 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,365 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to June 14, 1962, nonrecording gage at site 0.4 mi downstream at datum 0.94 ft lower.

REMARKS.--Records good. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--29 years, 19.8 ft<sup>3</sup>/s (14,350 acre-ft/yr); median of yearly mean discharges, 11 ft<sup>3</sup>/s (7,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,930 ft<sup>3</sup>/s Apr. 11, 1969; maximum gage height, 16.05 ft Apr. 11, 1969 (backwater from ice); no flow for long periods in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 20	0230	*85	a*5.27	No other peak greater than base discharge.			

a Ice jam.  
No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	4.7	.01	.25	.55	.00	.00
2	.00	.00	.00	.00	.00	.00	3.6	.00	.12	.41	.00	.00
3	.00	.00	.00	.00	.00	.00	2.4	.00	.10	.28	.00	.00
4	.00	.00	.00	.00	.00	.00	1.6	.00	.08	.16	.00	.00
5	.00	.00	.00	.00	.00	.00	1.1	.00	.07	.09	.00	.00
6	.00	.00	.00	.00	.00	.00	.71	.00	.06	.05	.00	.00
7	.00	.00	.00	.00	.00	.00	.64	.00	4.8	.02	.00	.00
8	.00	.00	.00	.00	.00	.00	.50	.00	11	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.35	.00	11	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.35	.00	10	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.28	.00	9.8	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.27	.06	6.9	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.24	.00	4.5	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.11	.00	3.7	.00	.00	.00
15	.00	.00	.00	.00	.00	.10	.11	.08	3.0	.00	.00	.00
16	.00	.00	.00	.00	.00	.20	.06	.19	2.3	.00	.00	.00
17	.00	.00	.00	.00	.00	.40	.06	.12	2.0	.00	.00	.00
18	.00	.00	.00	.00	.00	1.2	.05	.10	1.7	.00	.00	.00
19	.00	.00	.00	.00	.00	47	.03	.07	1.5	.00	.00	.00
20	.00	.00	.00	.00	.00	77	.03	.03	1.5	.00	.00	.00
21	.00	.00	.00	.00	.00	64	.03	.00	1.7	.00	.00	.00
22	.00	.00	.00	.00	.00	55	.04	.00	1.7	.00	.00	.00
23	.00	.00	.00	.00	.00	45	.03	.00	1.7	.00	.00	.00
24	.00	.00	.00	.00	.00	35	.01	.00	1.5	.00	.00	.00
25	.00	.00	.00	.00	.00	24	.00	.00	1.3	.00	.00	.00
26	.00	.00	.00	.00	.00	22	.00	.00	1.2	.00	.00	.00
27	.00	.00	.00	.00	.00	19	.00	.00	1.2	.00	.00	.00
28	.00	.00	.00	.00	.00	16	.00	.00	1.1	.00	.00	.00
29	.00	.00	.00	.00	---	13	.01	.00	.94	.00	.00	.00
30	.00	.00	.00	.00	---	8.9	.06	.01	.68	.00	.00	.00
31	.00	---	.00	.00	---	6.8	---	.29	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	434.60	17.37	.96	87.40	1.56	.00	.00
MEAN	.00	.00	.00	.00	.00	14.0	.58	.03	2.91	.05	.00	.00
MAX	.00	.00	.00	.00	.00	77	4.7	.29	11	.55	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00
AC-FT	.0	.00	.00	.00	.00	862	34	1.9	173	3.1	.00	.00
CAL YR 1984	TOTAL	10198.02		MEAN	27.9	MAX	1420	MIN	.00	AC-FT	20230	
WTR YR 1985	TOTAL	541.89		MEAN	1.48	MAX	77	MIN	.00	AC-FT	1070	

## 06471500 ELM RIVER AT WESTPORT, SD

LOCATION.--Lat 45°39'22", long 98°29'48", in SW¼NW¼ sec.12, T.125 N., R.64 W., Brown County, Hydrologic Unit 10160004, on right bank 12 ft downstream from highway bridge, 0.5 mi north of Westport, 0.7 mi upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, 9.3 mi downstream from Willow Creek, and 30.4 mi upstream from mouth.

DRAINAGE AREA.--1,680 mi<sup>2</sup>, approximately, of which about 510 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,309.3 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 6, 1951, and Apr. 8 to Sept. 9, 1952, nonrecording gage 12 ft upstream at same datum. Aug. 6, 1951, to Apr. 7, 1952, water-stage recorder at present site and datum.

REMARKS.--Records good except those for winter periods, Jan. 16 to Feb. 26 and Mar. 5-19, which are poor. Flow regulated for Aberdeen municipal water supply by dam forming Elm Lake and other small reservoirs upstream, combined capacity, about 16,000 acre-ft. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--40 years, 45.7 ft<sup>3</sup>/s (33,110 acre-ft/yr); median of yearly mean discharges, 25 ft<sup>3</sup>/s (18,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,600 ft<sup>3</sup>/s Apr. 10, 1969 (gage height, 22.11 ft); no flow for many days in most years prior to 1960.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 21	1715	*75	*5.12				

Minimum daily discharge, 0.15 ft<sup>3</sup>/s July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.5	6.2	12	4.8	1.0	6.4	8.7	1.7	7.3	.39	9.8	1.5
2	10	4.5	12	4.7	.95	5.4	9.6	1.6	9.3	.35	7.5	1.5
3	9.8	6.2	11	4.5	1.0	4.8	5.4	5.7	13	.23	4.0	1.2
4	10	6.4	11	4.8	1.0	3.6	4.1	5.6	13	.26	3.7	1.1
5	11	6.4	10	5.0	1.2	3.2	3.6	2.8	11	.54	3.6	.89
6	12	6.7	9.3	5.3	1.2	3.2	2.9	1.4	14	.38	4.4	.83
7	13	7.1	11	5.1	1.3	3.5	2.3	1.3	17	.23	3.8	.70
8	14	7.4	11	4.5	1.5	3.5	1.7	1.4	17	.15	3.6	.68
9	13	7.6	12	4.6	1.7	4.0	1.6	1.3	11	.26	3.0	.62
10	13	7.4	11	4.6	1.7	5.0	1.8	1.5	9.4	8.4	2.7	.44
11	15	7.9	10	4.4	1.6	6.0	2.0	1.6	9.8	7.5	2.6	.35
12	15	7.9	9.3	4.4	1.6	6.5	2.6	4.2	6.7	9.0	2.9	.91
13	13	8.7	8.8	4.6	2.0	7.0	3.5	2.4	6.7	9.8	2.6	2.8
14	13	10	8.6	4.5	2.5	8.0	4.2	.71	6.9	8.5	2.7	3.5
15	14	12	9.0	4.4	3.0	10	4.9	1.1	5.5	8.1	2.8	3.6
16	11	7.2	9.4	4.0	3.5	13	3.9	2.4	6.0	8.2	3.0	4.0
17	8.4	6.8	8.7	3.5	4.0	16	4.7	1.5	5.8	7.7	2.9	4.5
18	7.5	9.9	7.5	3.0	4.2	17	5.1	1.4	3.4	7.6	2.7	3.9
19	10	10	7.5	2.0	4.5	15	4.8	.67	2.0	7.3	2.3	3.9
20	4.0	10	7.3	2.1	4.5	14	4.7	.29	2.6	7.7	2.2	2.7
21	4.9	11	7.5	2.3	4.7	43	2.8	.31	3.2	8.0	4.1	1.8
22	4.8	12	6.4	2.3	5.0	66	2.2	.69	2.2	8.8	4.6	1.9
23	4.6	12	6.9	2.4	5.5	54	2.0	5.4	1.2	9.5	4.9	2.1
24	4.5	14	6.4	2.4	5.5	39	1.4	3.7	.93	6.9	3.2	1.3
25	4.9	16	6.3	2.2	5.0	34	1.4	1.4	.79	9.1	3.2	.94
26	5.3	15	6.4	2.0	5.0	27	.42	.55	.63	19	3.4	.92
27	6.6	16	6.2	1.6	6.0	23	.59	.26	.67	20	3.1	1.0
28	4.5	10	6.3	1.2	6.5	21	1.2	.16	.59	16	3.4	1.5
29	4.7	13	5.7	1.1	---	16	1.6	.80	.56	13	3.4	.97
30	5.2	12	5.5	1.0	---	14	2.1	2.7	.43	11	3.2	.76
31	5.3	---	5.1	1.0	---	11	---	6.1	---	9.9	2.0	---
TOTAL	280.5	287.3	265.1	104.3	87.15	503.1	97.81	62.64	188.60	223.79	111.3	52.81
MEAN	9.05	9.58	8.55	3.36	3.11	16.2	3.26	2.02	6.29	7.22	3.59	1.76
MAX	15	16	12	5.3	6.5	66	9.6	6.1	17	20	9.8	4.5
MIN	4.0	4.5	5.1	1.0	.95	3.2	.42	.16	.43	.15	2.0	.35
AC-FT	55	570	526	207	173	998	194	124	374	444	221	105
CAL YR 1984	TOTAL	18156.24		MEAN	49.6	MAX	1560	MIN	.20	AC-FT	36010	
WTR YR 1985	TOTAL	2264.40		MEAN	6.20	MAX	66	MIN	.15	AC-FT	4490	



## JAMES RIVER BASIN

06473000 JAMES RIVER AT ASHTON, SD

LOCATION.--Lat 44°59'54", long 98°28'50", in NW1/4NE1/4 sec.36, T.118 N., R.64 W., Spink County, Hydrologic Unit 10160006, on right bank at downstream side of highway bridge, 0.9 mi east of Ashton, 6.1 mi upstream from Snake Creek, and 14.2 mi upstream from Turtle Creek.

DRAINAGE AREA.--9,800 mi<sup>2</sup>, approximately, of which about 4,510 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1945 to current year.

REVISED RECORDS.--WSP 1209: 1947. WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,244.4 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 26, 1957, nonrecording gage at present site and Nov. 26, 1957, to Oct. 7, 1974, water-stage recorder at site 900 ft upstream all at present datum.

REMARKS.--Records good except those for winter period, Nov. 28 to Mar. 23, which are poor. Low flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973. Occasional backwater and reverse flow caused by Snake Creek during most years. Several observations of specific conductance were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--40 years, 160 ft<sup>3</sup>/s (115,900 acre-ft/yr); median of yearly mean discharges, 110 ft<sup>3</sup>/s (79,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,680 ft<sup>3</sup>/s Apr. 24, 1969 (gage height, 20.63 ft); maximum gage height, 21.17 ft Apr. 13, 1969 (backwater from Snake Creek); maximum daily reverse flow, 2,100 ft<sup>3</sup>/s Apr. 9, 1969 (backwater from Snake Creek).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 750 ft<sup>3</sup>/s at 0130 hours, Mar. 22 (gage height, 10.33 ft) (backwater from ice); no flow Feb. 2-6, July 27-30, Aug. 6-11, 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	89	85	13	.20	11	214	83	18	1.0	.30	2.8
2	34	87	85	12	.00	10	210	78	18	1.3	.46	3.1
3	38	89	80	13	.00	10	213	72	18	.95	.51	2.4
4	38	89	60	14	.00	10	216	65	19	.82	.74	2.1
5	38	94	42	14	.00	9.5	219	59	19	.79	.06	1.5
6	42	95	40	14	.00	10	220	53	20	.64	.00	.84
7	48	96	40	13	.05	11	219	48	20	.51	.00	.61
8	54	98	42	12	.20	12	216	44	17	.45	.00	1.9
9	51	102	43	12	.50	12	213	39	17	.40	.00	2.5
10	50	104	40	12	1.0	13	212	34	16	.34	.00	1.5
11	48	105	35	13	3.0	25	210	30	17	.28	.00	1.1
12	43	106	32	13	5.0	45	207	26	17	.27	1.2	1.6
13	40	95	30	13	7.0	80	204	30	15	.25	1.1	4.4
14	39	102	32	12	9.0	120	200	30	13	.22	.76	3.3
15	39	107	33	13	10	170	193	28	12	.19	.32	3.5
16	40	117	33	13	11	200	183	25	11	.15	.12	3.6
17	38	112	24	12	11	230	171	21	8.9	.17	.02	3.4
18	39	109	23	11	11	260	157	19	9.2	1.7	.04	2.6
19	44	101	24	10	12	290	141	17	7.4	2.3	.07	1.8
20	46	102	25	10	12	320	132	16	4.3	.89	.06	1.5
21	47	102	25	11	12	660	122	14	3.9	.09	.00	.61
22	49	103	23	11	12	700	115	14	3.3	.04	.47	.32
23	53	103	20	12	12	660	111	14	2.5	.06	1.6	.40
24	59	109	17	12	11	614	107	15	2.2	.66	1.4	.82
25	66	116	18	12	11	501	105	18	2.0	.68	.82	1.2
26	71	123	20	12	11	418	103	19	1.9	.30	.58	1.5
27	76	128	20	11	10	359	99	20	2.3	.00	1.8	2.0
28	81	115	19	10	11	316	95	19	1.9	.00	5.3	2.9
29	84	105	16	7.0	---	283	91	20	1.6	.00	3.9	3.1
30	87	95	14	3.0	---	255	87	19	1.1	.00	2.8	3.1
31	89	---	14	.50	---	230	---	21	---	.17	2.4	---
TOTAL	1601	3098	1054	350.50	182.95	6844.5	4985	1010	319.5	15.62	26.83	62.00
MEAN	51.6	103	34.0	11.3	6.53	221	166	32.6	10.7	.50	.87	2.07
MAX	89	128	85	14	12	700	220	83	20	2.3	5.3	4.4
MIN	30	87	14	.50	.00	9.5	87	14	1.1	.00	.00	.32
AC-FT	318	6140	2090	695	363	13580	9890	2000	634	31	53	123
CAL YR 1984	TOTAL	105069.5		MEAN	287	MAX	1170	MIN	5.5	AC-FT	208400	
WTR YR 1985	TOTAL	19549.90		MEAN	53.6	MAX	700	MIN	.00	AC-FT	38780	

06473000 JAMES RIVER AT ASHTON, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1977 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June to September 1985.

pH: June to September 1985.

WATER TEMPERATURE: October 1977 to current year.

DISSOLVED OXYGEN: June to September 1985.

REMARKS.--Temperature, specific conductance, pH, and dissolved oxygen collected daily by remote monitor during summer months.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,850 microsiemens, Aug. 26, 27, 1985; minimum daily, 720 microsiemens, Sept. 9, 1985.

pH: Maximum daily, 9.2 units, July 24, 25, 1985; minimum daily, 8.0 units, Sept. 23, 1985.

WATER TEMPERATURE: Maximum observed daily, 31.5°C, July 12, 1985; minimum daily, 0.0°C on several days during 1978-80, 1983, 1984.

DISSOLVED OXYGEN: Maximum observed daily, 13.7 mg/L, June 6, 1985; minimum daily, 5.7 mg/L, Sept. 25, 1985.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)
NOV 1984											
27...	15:30	126	900	8.1	-5.5	0.0	16	730	--	--	290
JAN 1985											
03...	15:10	13	1570	7.0	3.0	0.0	10	743	5.6	40	570
FEB											
27...	15:40	10	1440	7.5	9.5	0.5	8.6	739	3.4	24	510
MAR											
28...	13:00	317	510	8.3	4.5	8.0	9.8	724	13.8	123	220
APR											
24...	10:45	108	960	8.3	16.5	13.0	15	746	9.6	93	320
MAY											
23...	13:40	14	1230	7.9	18.5	21.5	20	749	--	--	400
JUN											
17...	12:20	8.5	1510	8.2	17.0	18.5	24	744	8.4	92	470
JUL											
18...	13:30	0.21	1630	8.7	30.0	26.5	31	736	9.6	125	520
AUG											
13...	16:25	0.99	1700	8.7	26.0	24.5	35	737	9.1	114	500

DATE	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SIO2)
NOV 1984											
27...	23	57	36	86	38	2	16	268	170	33	6.3
JAN 1985											
03...	120	120	66	160	37	3	22	450	360	95	18
FEB											
27...	47	110	56	120	33	2	22	458	280	72	18
MAR											
28...	92	50	23	58	35	2	15	128	160	34	8.1
APR											
24...	61	68	37	86	35	2	19	261	190	43	3.6
MAY											
23...	110	80	48	110	36	2	18	291	260	65	12
JUN											
17...	140	91	58	150	40	3	19	328	370	87	16
JUL											
18...	150	100	65	190	44	4	2.2	363	400	150	21
AUG											
13...	170	95	63	200	45	4	23	323	400	170	17

## JAMES RIVER BASIN

06473000 JAMES RIVER AT ASHTON, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)
NOV 1984										
27...	604	36	570	0.82	205	<0.01	<0.10	--	0.03	170
JAN 1985										
03...	1160	14	1100	1.6	41	<0.01	0.15	--	0.17	310
FEB										
27...	1000	20	960	1.4	27	0.01	0.11	0.10	0.24	250
MAR										
28...	425	56	430	0.58	364	0.02	0.31	0.29	0.56	140
APR										
24...	642	40	600	0.87	187	<0.01	<0.10	--	0.19	170
MAY										
23...	783	16	770	1.1	30	0.04	0.10	0.06	0.21	230
JUN										
17...	1010	46	990	1.4	23	<0.01	<0.10	--	0.32	310
JUL										
18...	1210	78	1100	1.6	0.69	0.02	<0.10	--	0.53	250
AUG										
13...	1200	42	1200	1.6	3.2	<0.01	<0.10	--	0.53	450

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1984										
27...	1	7	2	28	<0.1	<1	18	--	--	--
JAN 1985										
03...	5	13	1	1200	<0.1	<1	16	--	--	--
FEB										
27...	1	57	<1	8500	<0.1	<1	21	253	6.8	95
MAR										
28...	6	31	4	120	<0.1	<1	11	--	--	--
APR										
24...	23	14	3	900	<0.1	<1	<3	135	39	98
MAY										
23...	4	3	<1	1100	<0.1	<1	<3	--	--	--
JUN										
17...	4	4	5	2100	0.2	<1	<3	218	5.0	99
JUL										
18...	5	28	1	3700	<0.1	<1	35	283	0.16	96
AUG										
13...	4	6	<1	2300	0.2	<1	3	--	--	--



## JAMES RIVER BASIN

06473000 JAMES RIVER AT ASHTON, SD--Continued

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1							26.0	17.5	21.0	24.0	21.0	22.5
2				30.0	20.5	24.5	25.0	18.5	21.5	23.0	20.0	21.5
3				29.5	21.5	25.0	25.5	20.0	22.0	27.0	21.0	23.0
4	19.0	17.5	18.5	26.5	21.0	24.0	26.5	20.0	23.0	24.5	21.0	22.0
5	20.5	16.0	18.0	30.0	20.5	24.5	30.0	19.5	24.5	25.5	20.5	22.5
6	22.0	17.5	19.5	28.5	21.5	24.5	27.5	21.5	24.5	27.5	20.0	23.0
7	26.0	19.5	23.0	33.0	22.0	26.5				26.5	20.0	23.0
8	25.5	22.5	24.0	31.0	24.5	27.0				22.5	15.0	17.0
9	25.5	20.0	23.0	31.0	22.0	26.5				19.5	14.0	16.5
10	22.5	18.5	20.5	32.0	22.0	26.5				18.0	16.5	17.0
11	20.0	16.5	18.5	30.0	22.5	26.0				19.0	16.0	17.0
12	22.0	15.0	18.5	31.5	23.0	26.5	23.5	18.5	20.5	17.0	15.0	16.0
13	21.5	18.0	20.0	30.0	23.5	26.5	25.0	17.5	20.5	15.0	14.0	14.0
14	25.5	18.5	21.5	27.0	21.0	24.5	24.5	16.0	20.0	16.0	13.5	14.5
15	26.0	19.5	23.0	29.0	19.0	24.0	22.0	16.5	19.5	17.5	15.0	16.0
16	24.5	19.5	22.0	30.0	21.0	25.0	23.0	18.0	20.5	22.0	16.0	18.0
17				26.0	21.5	23.5	21.0	15.5	18.0	22.5	17.5	19.5
18				28.5	21.5	24.5	21.5	14.0	17.5	25.0	19.0	21.5
19				28.5	21.0	24.5	21.5	16.0	18.5	22.5	15.5	19.5
20				27.5	20.5	24.0	21.0	18.0	19.5	19.0	12.5	15.5
21				28.0	21.5	24.5				17.0	11.5	14.5
22				27.0	20.5	23.5	26.5	19.0	22.5	15.5	13.0	14.0
23				27.5	19.5	23.0	24.5	19.0	21.5	12.5	8.5	11.0
24				27.0	21.5	23.5	21.5	18.0	19.5	14.0	6.5	10.0
25				28.5	21.0	24.5	25.5	16.0	20.0	12.5	9.5	10.5
26				28.5	20.5	24.0	24.5	17.5	21.0	13.0	7.0	10.0
27							23.5	19.0	21.5	11.5	8.5	10.0
28							24.5	20.0	22.0	8.0	6.5	7.5
29							23.0	21.0	21.5	10.0	6.0	8.0
30							24.5	20.0	22.0	9.0	6.5	8.0
31				23.5	17.5	20.0	26.0	21.5	23.0			

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

[illegible]



## 06473700 SNAKE CREEK NEAR ASHTON, SD

LOCATION.--Lat 44°57'33", long 98°30'55", in SE¼NE¼SE¼ sec.10, T.117 N., R.64 W., Spink County, Hydrologic Unit 10160006, on right bank 500 ft upstream from U.S. Highway 281 bridge, 2.7 mi south of Ashton, and 2.7 mi upstream from mouth.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1955 to September 1969, October 1976 to September 1979 (October 1969 to September 1972 maximum discharge only). October 1984 to Sept. 30, 1985.

GAGE.--Water-stage recorder. Elevation of gage is 1,265 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Oct. 1, 1957, water-stage recorder at site 7.6 mi upstream at different datum. Oct. 1, 1957, to May 26, 1958, wire-weight gage; May 27, 1958, to Sept. 30, 1969, water-stage recorder; Oct. 1, 1969, to Sept. 30, 1972, crest-stage gage; and Oct. 1, 1976, to Sept. 30, 1979, water-stage recorder at site 18.3 mi upstream at different datum.

REMARKS.--Records good except those for winter periods, Nov. 29 to Jan. 1 and Jan. 4 to Mar. 19, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--18 years, 23.1 ft<sup>3</sup>/s (16,740 acre-ft/yr); median of yearly mean discharges, 7.0 ft<sup>3</sup>/s (5,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,980 ft<sup>3</sup>/s Apr. 10, 1969 (gage height, 17.21 ft); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 75 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 21	1345	*675	*7.66	No other peak greater than base discharge.			

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.55	.25	.06	.00	.00	65	6.7	.08	.00	.00	.00
2	.01	.14	.23	.07	.00	.00	58	6.2	.05	.00	.00	.00
3	.01	.08	.21	.05	.00	.00	51	5.4	.01	.00	.05	.00
4	.01	.14	.20	.03	.00	.00	45	5.0	.00	.00	.00	.00
5	.01	.12	.15	.03	.00	.00	40	4.6	.01	.00	.00	.00
6	.01	.05	.15	.02	.00	.00	35	4.7	.00	.00	.00	.00
7	.02	.03	.20	.02	.00	.05	32	4.3	.00	.00	.00	.00
8	.02	.02	.20	.01	.00	.20	28	3.3	.00	.00	.00	.33
9	.02	.01	.21	.01	.00	.30	25	3.0	.00	.00	.00	3.5
10	.02	.02	.20	.00	.00	.60	23	2.3	.00	.00	.00	1.3
11	.02	.02	.18	.00	.00	1.0	22	2.1	.00	.00	.00	.64
12	.03	.02	.16	.00	.00	2.0	20	2.0	.00	.00	.00	.47
13	.03	.02	.16	.00	.00	5.0	20	.25	.00	.00	.00	7.5
14	.03	.03	.18	.00	.00	10	18	1.4	.00	.00	.00	9.9
15	.03	.03	.18	.00	.00	20	18	2.6	.00	.00	.00	7.6
16	.03	.03	.15	.00	.00	100	16	1.9	.00	.00	.00	4.7
17	.03	.03	.12	.00	.00	95	15	.66	.00	.00	.00	4.0
18	.03	.04	.10	.00	.00	90	14	.88	.00	.00	.00	3.5
19	2.3	.12	.12	.00	.00	110	13	1.7	.00	.00	.00	3.2
20	1.4	.63	.14	.00	.00	432	15	1.7	.00	.00	.00	3.0
21	1.0	.55	.14	.00	.00	631	14	.57	.00	.00	.00	2.5
22	.55	.43	.10	.00	.00	490	14	.33	.00	.00	.00	2.2
23	.14	1.0	.08	.00	.00	322	14	.08	.00	.00	.00	2.0
24	.05	1.0	.06	.00	.00	229	12	.04	.00	.00	.00	1.8
25	.04	.55	.06	.00	.00	180	10	.09	.00	.00	.00	1.6
26	.05	.49	.08	.00	.00	157	9.6	.17	.00	.00	.00	1.4
27	.12	.49	.08	.00	.00	130	8.5	.14	.00	.00	.00	1.3
28	3.2	.29	.06	.00	.00	111	7.2	.03	.00	.00	.00	1.2
29	5.0	.27	.05	.00	---	98	7.0	.10	.00	.00	.00	1.1
30	3.4	.25	.05	.00	---	84	7.3	.10	.00	.00	.00	1.0
31	1.1	---	.05	.00	---	75	---	.19	---	.00	.00	---
TOTAL	18.72	7.45	4.30	.30	.00	3373.15	676.6	62.53	.15	.00	.05	65.74
MEAN	.60	.25	.14	.01	.00	109	22.6	2.02	.00	.00	.00	2.19
MAX	5.0	1.0	.25	.07	.00	631	65	6.7	.08	.00	.05	9.9
MIN	.01	.01	.05	.00	.00	.00	7.0	.03	.00	.00	.00	.00
AC-FT	3	15	8.5	.6	.00	6690	1340	124	.3	.00	.1	130
WTR YR 1985	TOTAL	4208.99		MEAN	11.5	MAX	631	MIN	.00	AC-FT	8350	

## JAMES RIVER BASIN

06473700 SNAKE CREEK NEAR ASHTON, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1984 to September 1985.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CaCO3)
NOV 1984											
27...	16:45	0.56	1160	7.7	-6.0	0.5	8.0	731	--	--	300
JAN 1985											
03...	12:00	0.04	2010	7.3	-6.0	0.5	12	743	7.7	55	560
MAR											
29...	09:00	100	400	8.2	-2.0	0.5	8.6	728	12.8	93	150
APR											
24...	08:30	13	950	8.2	10.0	10.0	21	747	8.7	79	270
MAY											
23...	15:00	0.07	1340	8.3	25.5	--	12	749	--	--	320
SEP											
11...	12:00	0.55	415	7.4	15.0	16.5	1100	745	2.8	29	110

DATE	HARD- NESS, NONCAR- BONATE (MG/L AS CaCO3)	CALCIUM DIS- SOLVED (MG/L AS Ca)	MAGNE- SIUM, DIS- SOLVED (MG/L AS Mg)	SODIUM, DIS- SOLVED (MG/L AS Na)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY LAB (MG/L AS CaCO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS Cl)	SILICA, DIS- SOLVED (MG/L AS SiO2)
NOV 1984											
27...	--	67	33	150	50	4	18	338	130	120	3.8
JAN 1985											
03...	--	120	63	290	51	5	33	648	220	240	5.0
MAR											
29...	40	37	15	54	40	2	15	114	94	41	11
APR											
24...	26	62	28	97	41	3	22	244	140	80	2.0
MAY											
23...	--	66	37	150	48	4	24	331	190	140	3.0
SEP											
11...	0	26	12	36	35	2	23	114	67	24	20

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	ALUM- INUM, DIS- SOLVED (UG/L AS Al)
NOV 1984											
27...	754	21	730	1.0	1.1	<0.01	<0.10	--	0.34	300	--
JAN 1985											
03...	1340	16	1400	1.8	0.14	<0.01	<0.10	--	0.63	560	--
MAR											
29...	342	29	340	0.47	92	0.05	0.37	0.32	0.32	150	--
APR											
24...	655	45	580	0.89	23	<0.01	<0.10	--	0.49	250	--
MAY											
23...	825	47	810	1.1	0.16	0.01	0.15	0.14	0.15	400	20
SEP											
11...	285	200	280	0.39	0.42	<0.01	<0.10	--	0.87	110	--

## JAMES RIVER BASIN

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06473700 SNAKE CREEK NEAR ASHTON, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, DIS- SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1984										
27...	3	15	<1	240	<0.1	<1	13	--	--	--
JAN 1985										
03...	3	20	<1	820	<0.1	<1	10	--	--	--
MAR										
29...	4	160	2	190	<0.1	<1	5	--	--	--
APR										
24...	8	35	3	730	<0.1	<1	<3	94	3.3	97
MAY										
23...	2	<3	4	570	0.1	<1	<3	--	--	--
SEP										
11...	19	200	<1	250	0.4	<1	11	209	0.31	98

## JAMES RIVER BASIN

06473750 WOLF CREEK NEAR REE HEIGHTS, SD

LOCATION.--Lat 44°36'25", long 99°13'54", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$  sec.11, T.113 N., R.70 W., Hand County, Hydrologic Unit 10160009, on left bank on downstream side of highway bridge, 0.3 mi downstream from small left-bank tributary, 6.5 mi north of Ree Heights, and 13.8 mi upstream from Lake Louise dam.

DRAINAGE AREA.--265 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1959 to September 1981, October 1984 to Sept. 30, 1985.

GAGE.--Water-stage recorder. Datum of gage is 1,614.16 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1981, water-stage recorder on right downstream side of bridge at present datum.

REMARKS.--Records good. Flow regulated by small reservoir 0.5 mi (2,700 acre-ft/yr); median of yearly mean discharges, 0.11 ft<sup>3</sup>/s (80 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 990 ft<sup>3</sup>/s Apr. 5, 1969 (gage height, 9.33 ft); maximum gage height, 9.57 ft Mar. 14, 1966 (backwater from ice); no flow for many days each year.

EXTREMES FOR PERIOD OF RECORD.--Peak discharges greater than base discharge of 40 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 15	1845	70	a*7.19	Mar. 27	1345	*183	6.96

a Backwater from ice.

No flow Oct. 1 to Mar. 8, Apr. 19 to Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	71	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	55	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	28	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	16	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	11	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	6.2	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	2.0	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.20	.42	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.50	.30	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	1.5	.25	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	4.0	.20	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	10	.15	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	25	.10	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	52	.07	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	65	.05	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	60	.03	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	57	.01	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	57	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	47	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	33	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	21	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	23	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	21	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	18	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	18	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	107	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	168	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	138	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	111	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	92	---	.00	---	.00	.00	---
TOTAL	.00	.00	.00	.00	.00	1129.20	191.78	.00	.00	.00	.00	.00
MEAN	.00	.00	.00	.00	.00	36.4	6.39	.00	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	168	71	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.00	.00	.00	.00	2240	380	.00	.00	.00	.00	.00

WTR YR 1985 TOTAL 1320.98 MEAN 3.62 MAX 168 MIN .00 AC-FT 2620

## JAMES RIVER BASIN

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06473750 WOLF CREEK NEAR REE HEIGHTS, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1984 to September 1985.

REMARKS.--No flow from Oct. 1, 1984, to Mar. 8, 1985, Apr. 19, 1985, to Sept. 30, 1985.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	HARD- NESS (MG/L AS CACO3)
MAR 1985											
18...	11:55	56	150	7.5	17.0	8.5	32	714	--	--	58
29...	14:00	142	210	8.1	-2.0	1.0	56	725	12.6	93	72

DATE	HARD- NESS, NONCAR- BONATE (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)
MAR 1985											
18...	17	13	6.2	3.4	9	0.2	13	41	29	5.3	11
29...	27	16	7.9	5.4	11	0.3	15	45	42	8.5	14

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDE (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)
MAR 1985										
18...	124	57	110	0.17	19	0.02	0.56	0.54	0.57	30
29...	226	180	140	0.31	87	0.02	0.16	0.14	0.19	40

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
MAR 1985										
18...	7	380	<1	51	<0.1	<1	17	68	10	98
29...	14	170	<1	7	<0.1	<1	5	--	--	--



## JAMES RIVER BASIN

06474000 TURTLE CREEK NEAR TULARE, SD

LOCATION.--Lat 44°44'06", long 98°35'09", in SE½SE¼ sec.25, T.115 N., R.65 W., Spink County, Hydrologic Unit 10160009, on left bank at downstream side of highway bridge, 3.9 mi west of Tulare, and 8.9 mi downstream from Wolf Creek.

DRAINAGE AREA.--1,120 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1953 to September 1956, September 1965 to September 1981, October 1984 to Sept. 30, 1985.

GAGE.--Water-stage recorder. Elevation of gage is 1,300 ft, by barometer. Prior to Oct. 6, 1965, nonrecording gage at same site and datum. Oct. 7, 1965, to Sept. 30, 1981, water-stage recorder at present site and datum.

REMARKS.--Records fair except those for winter period, Nov. 16 to Mar. 20, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--20 years, 13.2 ft<sup>3</sup>/s (9,560 acre-ft/yr); median of yearly mean discharges, 1.6 ft<sup>3</sup>/s (1,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 6,000 ft<sup>3</sup>/s Apr. 5, 1969; maximum gage height, 18.51 ft Apr. 5, 1969 (backwater from ice); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 20	1900	*800	a*11.89	No other peak greater than base discharge.			
a Backwater from ice. No flow for many days.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.41	.35	.25	.00	2.4	130	5.7	.40	.07	.01	.01
2	.20	.48	.33	.27	.00	2.2	128	4.8	.34	.08	.00	.01
3	.20	.58	.33	.28	.00	2.0	110	3.6	.31	.07	.00	.01
4	.20	.47	.30	.28	.00	2.0	98	4.6	.31	.06	.01	.02
5	.20	.51	.30	.28	.00	1.7	88	3.9	.28	.05	.01	.03
6	.22	.54	.30	.26	.00	1.8	78	3.9	.25	.03	.01	.03
7	.22	.59	.31	.24	.01	2.0	65	3.1	.24	.02	.00	.03
8	.23	.55	.33	.22	.02	2.5	53	2.4	.24	.01	.00	2.8
9	.23	.48	.35	.22	.03	3.0	43	2.3	.21	.00	.01	1.5
10	.24	.49	.35	.22	.04	5.0	40	2.0	.18	.00	.00	1.9
11	.24	.53	.34	.22	.05	8.0	35	1.9	.20	.00	.00	1.8
12	.25	.58	.33	.23	.10	10	32	2.6	.17	.00	.00	1.9
13	.25	.64	.32	.24	.20	20	29	1.2	.14	.00	.00	2.5
14	.26	.67	.32	.23	.30	40	24	1.2	.13	.00	.00	2.4
15	.27	.50	.33	.20	.50	70	23	1.5	.11	.00	.00	2.2
16	.27	.50	.34	.10	.60	150	17	1.6	.10	.00	.00	2.1
17	.27	.45	.33	.05	.75	280	15	1.5	.09	.00	.01	2.2
18	.28	.45	.30	.00	.95	500	10	1.5	.07	.00	.00	2.2
19	.30	.50	.28	.00	1.1	650	7.6	1.4	.06	.00	.00	2.5
20	.31	.50	.30	.00	1.3	700	13	1.3	.05	.00	.00	2.5
21	.34	.50	.30	.00	1.6	584	12	1.1	.06	.00	.00	2.1
22	.39	.50	.29	.00	1.9	443	9.4	1.1	.05	.00	.00	2.4
23	.46	.52	.27	.00	2.0	354	8.8	.90	.04	.00	.01	2.7
24	.51	.55	.26	.00	2.0	270	10	.78	.03	.02	.01	2.1
25	.50	.50	.27	.00	2.1	199	7.4	.63	.06	.02	.00	2.1
26	.53	.45	.29	.00	2.0	147	7.5	.53	.07	.01	.00	1.8
27	.43	.40	.28	.00	2.0	100	7.3	.46	.07	.01	.01	1.8
28	.41	.39	.26	.00	2.5	85	6.0	.39	.07	.01	.01	1.4
29	.47	.35	.26	.00	---	73	5.3	.40	.06	.01	.01	1.3
30	.40	.35	.26	.00	---	62	6.3	.41	.05	.01	.01	1.2
31	.46	---	.25	.00	---	87	---	.45	---	.01	.01	---
TOTAL	9.72	14.93	9.43	3.79	22.05	4856.6	1118.6	59.15	4.44	.49	.13	47.54
MEAN	.31	.50	.30	.12	.79	157	37.3	1.91	.15	.02	.00	1.58
MAX	.53	.67	.35	.28	2.5	700	130	5.7	.40	.08	.01	2.8
MIN	.18	.35	.25	.00	.00	1.7	5.3	.39	.03	.00	.00	.01
AC-FT	1	30	19	7.5	44	9630	2220	117	8.8	.0	.3	94
WTR YR 1985	TOTAL	6146.87		MEAN	16.8	MAX	700	MIN	.00	AC-FT	12190	

## JAMES RIVER BASIN

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06474000 TURTLE CREEK NEAR TULARE, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1984 to September 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	HARD- NESS (MG/L AS CACO3)
NOV 1984											
28...	10:15	0.39	995	8.1	-4.0	0.5	4.2	728	--	--	390
JAN 1985											
02...	14:30	0.27	1640	7.7	-6.0	0.5	3.9	743	15.3	110	750
FEB											
25...	15:35	2.1	1380	7.5	5.5	1.0	4.0	731	8.3	61	580
MAR											
29...	11:00	72	430	9.0	-2.0	1.0	15	726	13.2	98	190
APR											
23...	15:00	9.2	780	8.0	17.0	14.0	14	744	10.0	100	320
MAY											
24...	09:50	2.0	880	8.7	20.0	21.0	5.4	738	--	--	340
JUN											
19...	08:10	0.06	870	9.1	15.0	15.5	7.5	739	7.7	80	300
SEP											
11...	15:00	1.9	480	8.0	17.0	16.0	130	742	5.8	60	150

DATE	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SIO2)
NOV 1984											
28...	120	71	51	72	28	2	18	265	230	44	0.1
JAN 1985											
02...	200	160	86	120	25	2	26	553	390	69	14
FEB											
25...	140	130	63	82	23	2	17	446	300	47	22
MAR											
29...	59	45	18	25	21	0.8	17	127	100	15	13
APR											
23...	100	76	32	44	22	1	18	222	160	27	14
MAY											
24...	98	71	40	56	25	1	20	244	180	32	8.3
JUN											
19...	110	53	41	63	30	2	19	193	200	36	2.0
SEP											
11...	40	27	21	37	32	1	16	114	100	22	3.4

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)
NOV 1984										
28...	683	8	650	0.93	0.72	<0.01	<0.10	--	0.17	150
JAN 1985										
02...	1260	10	1200	1.7	0.92	<0.01	<0.10	--	0.28	240
FEB										
25...	978	10	930	1.3	5.5	0.02	0.22	0.20	0.34	170
MAR										
29...	324	18	310	0.44	63	0.05	0.60	0.55	0.26	110
APR										
23...	521	33	510	0.71	13	<0.01	<0.10	--	0.21	120
MAY										
24...	537	31	550	0.73	2.9	<0.01	<0.10	--	0.11	310
JUN										
19...	569	17	530	0.77	0.09	<0.01	<0.10	--	0.25	140
SEP										
11...	305	42	300	0.41	1.6	0.01	0.50	0.49	0.39	100

## JAMES RIVER BASIN

06474000 TURTLE CREEK NEAR TULARE, SD--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1984										
28...	1	10	1	27	<0.1	<1	24	--	--	--
JAN 1985										
02...	2	3	1	73	<0.1	<1	16	--	--	--
FEB										
25...	1	30	1	1700	<0.1	<1	21	--	--	--
MAR										
29...	3	110	2	120	0.2	<1	13	--	--	--
APR										
23...	28	86	<1	920	<0.1	<1	17	61	1.5	97
MAY										
24...	3	97	3	30	0.1	<1	<3	--	--	--
JUN										
19...	2	5	4	11	0.2	<1	<3	--	--	--
SEP										
11...	3	45	<1	180	0.3	<1	<3	65	0.33	97

## 06474300 MEDICINE CREEK NEAR ZELL, SD

LOCATION.--Lat 44°45'52", long 98°42'13", in NW¼NW¼ sec.19, T.115 N., R.65 W., Spink County, Hydrologic Unit 10160009, on right bank at downstream side of bridge on State Highway 26, 3.8 mi upstream from Cottonwood Lake, and 9.2 mi south of Zell.

DRAINAGE AREA.--210 mi<sup>2</sup>, approximately.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1959 to September 1981, October 1984 to Sept. 30, 1985.

GAGE.--Water-stage recorder. Elevation of gage is 1,320 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Oct. 1, 1981, water-stage recorder on downstream side at center of bridge at present datum.

REMARKS.--Records good except those for winter period, Jan. 1 to Mar. 18, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--23 years, 5.67 ft<sup>3</sup>/s (4,110 acre-ft/yr); median of yearly mean discharges, 2.0 ft<sup>3</sup>/s (1,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,210 ft<sup>3</sup>/s Apr. 5, 1969 (gage height, 12.41 ft); no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	2030	*450	a*9.52	No other peak greater than base discharge.			
a Backwater from ice.							
No flow for many days.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.01	.05	.00	.00	.16	13	.74	.05	.05	.00	.00
2	.02	.01	.06	.00	.00	.13	12	.66	.03	.06	.00	.00
3	.02	.02	.06	.00	.00	.11	11	.61	.04	.05	.01	.00
4	.02	.02	.06	.00	.00	.10	9.6	.51	.06	.04	.02	.01
5	.03	.02	.06	.00	.00	.10	9.0	.36	.06	.03	.01	.00
6	.03	.02	.08	.00	.00	.15	8.6	.35	.06	.04	.00	.00
7	.03	.02	.08	.00	.01	.20	8.0	.37	.06	.04	.00	.00
8	.03	.02	.07	.00	.01	.25	7.3	.28	.04	.02	.00	.56
9	.03	.02	.07	.00	.01	.50	6.9	.15	.04	.01	.00	.05
10	.04	.02	.07	.00	.02	1.0	6.5	.12	.05	.01	.00	.11
11	.04	.02	.07	.00	.03	2.0	5.9	.10	.06	.00	.00	.27
12	.04	.02	.07	.00	.04	3.0	5.5	.14	.05	.00	.03	.61
13	.04	.03	.06	.00	.05	5.0	5.1	.07	.05	.00	.02	1.4
14	.04	.04	.06	.00	.05	10	4.6	.06	.03	.01	.01	1.0
15	.05	.04	.05	.00	.06	20	4.5	.10	.03	.01	.00	1.5
16	.05	.04	.05	.00	.08	100	3.6	.12	.03	.00	.02	3.3
17	.05	.04	.06	.00	.10	330	3.5	.08	.03	.00	.01	3.0
18	.05	.04	.06	.00	.12	300	3.3	.07	.03	.01	.00	2.1
19	.04	.04	.06	.00	.13	184	3.0	.06	.04	.00	.00	1.2
20	.04	.04	.06	.00	.14	129	2.8	.05	.04	.00	.00	.62
21	.04	.04	.05	.00	.15	98	2.6	.04	.04	.00	.00	.32
22	.04	.04	.05	.00	.15	67	2.5	.06	.04	.00	.00	.21
23	.04	.04	.05	.00	.16	51	2.2	.05	.03	.00	.02	.12
24	.04	.04	.03	.00	.16	38	2.0	.04	.02	.02	.00	.12
25	.04	.04	.00	.00	.16	29	1.6	.04	.04	.00	.00	2.7
26	.04	.04	.00	.00	.16	24	1.5	.03	.04	.00	.00	4.4
27	.04	.04	.00	.00	.16	23	1.4	.03	.04	.00	.00	4.0
28	.03	.04	.00	.00	.20	20	1.2	.04	.04	.00	.00	3.1
29	.03	.05	.00	.00	---	18	1.1	.06	.05	.00	.00	2.6
30	.02	.05	.00	.00	---	16	.95	.05	.04	.01	.00	2.0
31	.02	---	.00	.00	---	14	---	.07	---	.01	.00	---
TOTAL	1.09	.95	1.44	.00	2.15	1483.70	150.75	5.51	1.26	.42	.15	35.30
MEAN	.03	.03	.05	.00	.08	47.9	5.02	.18	.04	.01	.00	1.18
MAX	.05	.05	.08	.00	.20	330	13	.74	.06	.06	.03	4.4
MIN	.02	.01	.00	.00	.00	.10	.95	.03	.02	.00	.00	.00
AC-FT	2.	1.9	2.9	.00	4.3	2940	299	11	2.5	.8	.3	70
WTR YR 1985	TOTAL	1682.72		MEAN	4.61	MAX	330	MIN	.00	AC-FT	3340	

## JAMES RIVER BASIN

06474300 MEDICINE CREEK NEAR ZELL, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1984 to September 1985.

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
NOV 1984										
28...	11:00	0.4	1620	8.0	-3.0	0.5	34	728	--	--
FEB 1985										
25...	13:10	0.16	1040	7.8	11.5	0.5	3.6	729	11.2	82
MAR										
29...	12:10	18	659	8.1	-2.0	0.5	8.6	--	13.0	--
APR										
23...	12:30	2.3	1360	8.3	16.0	14.0	6.6	745	12.0	119
MAY										
24...	10:40	0.05	1750	7.8	20.5	21.5	10	738	--	--
JUN										
19...	09:40	0.03	1770	8.2	17.0	14.5	11	739	7.3	74
AUG										
13...	12:10	0.02	1630	8.2	18.0	19.0	31	735	7.6	85
SEP										
11...	16:00	0.19	1670	8.1	17.0	17.5	22	741	18.0	195

DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)
NOV 1984										
28...	490	120	120	46	220	49	4	8.6	370	450
FEB 1985										
25...	270	110	66	25	110	45	3	15	161	280
MAR										
29...	180	37	42	19	69	42	2	18	146	140
APR										
23...	380	51	83	41	160	46	4	20	325	270
MAY										
24...	490	100	120	47	220	49	4	12	390	410
JUN										
19...	440	100	100	47	230	52	5	10	341	420
AUG										
13...	460	110	110	44	200	48	4	12	349	410
SEP										
11	310	94	59	40	250	61	6	27	218	480

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, SUS- PENDED (MG/L)	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)
NOV 1984										
28...	110	16	1190	129	1200	1.6	1.3	<0.01	<0.10	--
FEB 1985										
25...	58	12	688	10	660	0.94	0.3	0.05	0.49	0.44
MAR										
29...	36	17	444	18	430	0.6	22	0.02	0.25	0.23
APR										
23...	85	12	897	12	870	1.2	5.6	<0.01	<0.10	--
MAY										
24...	110	22	1200	6	1200	1.6	0.16	<0.01	<0.10	--
JUN										
19...	120	20	1180	13	1200	1.6	0.1	<0.01	<0.10	--
AUG										
13...	120	26	1140	56	1100	1.6	0.06	<0.01	<0.10	--
SEP										
11...	140	18	1200	56	1100	1.6	0.62	<0.01	<0.10	--



## JAMES RIVER BASIN

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06474300 MEDICINE CREEK NEAR ZELL, SD--Continued

WATER QUALITY DATA, NOVEMBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 1984									
28...	0.04	330	2	42	3	810	<0.1	<1	24
FEB 1985									
25...	0.63	130	2	200	<1	850	<0.1	<1	8
MAR									
29...	0.27	120	27	160	3	72	0.2	<1	13
APR									
23...	0.37	230	4	67	10	480	<0.1	<1	13
MAY									
24...	0.12	370	2	11	1	1500	<0.1	<1	<3
JUN									
19...	0.03	380	2	20	5	410	<0.1	<1	3
AUG									
13...	0.05	440	2	7	<1	780	<0.1	<1	<3
SEP									
11...	0.18	390	18	43	<1	130	0.2	<1	8

## JAMES RIVER BASIN

## 06475000 JAMES RIVER NEAR REDFIELD, SD

LOCATION.--Lat 44°54'33", long 98°27'34", in NW¼NE¼ sec.31, T.117 N., R.63 W., Spink County, Hydrologic Unit 10160006, on right bank 0.6 mi downstream from county highway bridge, 3.3 mi northeast of Redfield, and 1.3 mi downstream from Turtle Creek.

DRAINAGE AREA.--13,600 mi<sup>2</sup>, approximately, of which about 4,920 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--March 1950 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area. WDR SD-84-1: Datum.

GAGE.--Water-stage recorder. Datum of gage is 1,239.50 ft above National Geodetic Vertical Datum of 1929. From March 1950 to July 25, 1951, nonrecording gage. From July 26, 1951, to Sept. 30, 1981, water-stage recorder. Both gages described above at site 3.9 mi downstream from present site and at different datum.

REMARKS.--Records good except those for winter period, Nov. 29 to Mar. 23, which are poor. Low flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973. Flow below 100 ft<sup>3</sup>/s for water years 1964-79 may be unreliable because of wind effect. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--35 years, 190 ft<sup>3</sup>/s (137,700 acre-ft/yr); median of yearly mean discharges, 130 ft<sup>3</sup>/s (94,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,310 ft<sup>3</sup>/s Apr. 13, 1969 (gage height, 24.93 ft); no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,700 ft<sup>3</sup>/s at 1115 hours, Mar. 22 (gage height, 12.40 ft), backwater from ice; no flow Feb. 3-7, July 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	108	100	15	.50	12	355	112	25	2.9	1.2	6.1
2	28	102	95	13	.20	12	356	107	22	2.9	.84	6.0
3	28	108	95	13	.00	12	366	102	20	2.4	.59	6.6
4	27	106	90	14	.00	11	368	98	20	1.7	1.1	7.2
5	26	107	75	16	.00	11	362	88	19	1.3	1.4	6.7
6	27	114	65	16	.00	12	349	81	19	.99	1.6	5.3
7	28	114	60	16	.00	13	334	75	19	.88	1.4	3.9
8	29	112	50	15	.08	14	319	69	17	.71	1.4	34
9	29	114	52	14	.20	15	307	66	14	.62	1.1	52
10	30	117	52	14	.40	15	296	59	14	.50	.69	26
11	29	121	45	14	1.0	25	284	53	14	.43	.42	20
12	30	123	40	15	3.0	40	272	44	12	.39	1.7	19
13	29	118	38	15	5.0	70	254	38	9.6	.26	1.8	34
14	28	108	38	15	8.0	120	245	43	9.4	.20	1.8	35
15	30	114	40	15	10	200	240	48	9.2	.08	1.6	31
16	29	121	38	14	12	400	227	46	9.1	.00	1.4	24
17	28	126	35	14	12	500	210	41	8.5	.41	1.1	18
18	30	115	32	13	13	600	195	36	7.6	2.5	.50	14
19	34	112	29	12	14	900	184	35	6.7	1.3	.29	11
20	35	113	31	12	14	1230	177	33	6.4	.55	.14	8.0
21	42	114	30	13	14	1500	162	30	5.5	.23	.02	7.3
22	45	111	27	14	14	1600	152	30	5.0	.06	.23	6.2
23	51	109	24	14	14	1500	142	29	4.1	.04	1.3	5.1
24	60	111	23	14	13	1360	138	27	3.5	1.1	1.3	4.4
25	71	115	23	14	13	1090	135	27	3.3	1.2	1.4	3.7
26	82	119	25	14	13	883	131	29	3.6	.70	1.6	3.2
27	92	128	25	13	12	711	125	29	4.3	.49	2.5	3.1
28	97	120	23	12	12	613	122	27	3.7	.39	5.5	2.7
29	104	120	21	9.0	---	504	119	29	3.3	.23	9.2	3.4
30	107	110	18	7.0	---	447	117	28	3.3	.52	8.7	5.0
31	109	---	16	2.0	---	394	---	27	---	1.5	7.4	---
TOTAL	1443	3430	1355	411.0	198.38	14814	7043	1586	321.1	27.48	61.22	411.9
MEAN	46.5	114	43.7	13.3	7.08	478	235	51.2	10.7	.89	1.97	13.7
MAX	109	128	100	16	14	1600	368	112	25	2.9	9.2	52
MIN	26	102	16	2.0	.00	11	117	27	3.3	.00	.02	2.7
AC-FT	286	6800	2690	815	393	29380	13970	3150	637	55	121	817
CAL YR 1984	TOTAL	129049.8		MEAN	353	MAX	1560	MIN	4.8	AC-FT	256000	
WTR YR 1985	TOTAL	31102.08		MEAN	85.2	MAX	1600	MIN	.00	AC-FT	61690	

## 06476000 JAMES RIVER AT HURON, SD

LOCATION.--Lat 44°21'49", long 98°11'56", in SW¼SE¼NE¼ sec.6, T.110 N., R.61 W., Beadle County, Hydrologic Unit 10160006, 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.--15,600 mi<sup>2</sup>, approximately, of which about 5,110 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1928 to September 1932, August 1943 to current year. Monthly discharge only for some periods, published in WSP 1309. Gage-height records collected at site about 100 ft downstream for period of open water each year July 1902 to June 1914 and for period March to June 1915-23 are in reports of the National Weather Service.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder and concrete dam. Datum of gage is 1,223.44 ft above National Geodetic Vertical Datum of 1929. Aug. 29, 1928, to Mar. 15, 1929, nonrecording gage at site 100 ft downstream at about same datum. Mar. 16, 1929, to June 30, 1932, nonrecording gage 165 ft downstream at present datum. Aug. 3, 1943, to Oct. 17, 1951, nonrecording gage at site 15 ft downstream at present datum.

REMARKS.--Records good above 100 ft<sup>3</sup>/s and fair below. Low flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973.

AVERAGE DISCHARGE.--46 years, 232 ft<sup>3</sup>/s (168,100 acre-ft/yr); median of yearly mean discharges, 140 ft<sup>3</sup>/s (101,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,000 ft<sup>3</sup>/s Apr. 13, 1969 (gage height, 16.70 ft); no flow for long periods in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood between Apr. 11 and 13, 1881, reached a stage of 19.8 ft, from U.S. Weather Bureau publication. Flood of Mar. 22, 1922, reached a stage of 16.5 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,040 ft<sup>3</sup>/s at 2115 hours, Mar. 23 (gage height, 11.14 ft); no flow for many days.

Rating table (gage height, in feet, and discharge, in cubic feet per second)

8.80	6.8	9.2	147	9.80	680	12.00	2,650
9.00	62	9.40	292	10.50	1,520		

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	75	109	36	17	51	596	173	57	.00	.00	.00
2	45	73	110	35	17	52	564	166	47	.00	.00	.00
3	45	79	107	33	17	51	513	143	46	.00	.00	.00
4	40	84	106	31	16	50	486	158	47	.02	.00	4.1
5	41	86	102	29	15	48	491	159	41	.00	.00	35
6	47	89	100	29	14	47	477	150	33	.00	.00	51
7	49	89	97	27	14	44	462	153	40	.00	.00	41
8	48	95	94	27	14	41	431	125	42	.00	.00	52
9	42	108	92	27	14	40	387	137	41	.00	.00	53
10	36	98	89	27	14	39	392	119	45	.00	.00	65
11	18	98	88	26	13	41	370	119	47	.00	.00	68
12	22	99	84	26	13	52	356	130	45	.00	.00	79
13	37	103	83	26	13	92	389	110	38	.00	.00	80
14	52	103	81	25	13	253	310	104	41	.00	.00	87
15	58	103	78	26	13	531	309	117	38	.00	.00	93
16	54	103	75	27	13	1050	281	108	39	.00	.00	96
17	45	103	71	26	15	1470	270	91	36	.00	.00	102
18	69	99	68	27	16	1560	275	83	40	.00	.00	98
19	64	95	65	26	17	1600	239	83	21	.00	.00	96
20	65	96	63	26	26	1630	264	73	5.2	.00	.00	97
21	64	92	58	25	34	1680	265	63	7.5	.00	.00	85
22	63	97	56	24	38	1750	273	56	2.3	.00	.00	87
23	59	95	53	23	37	1970	261	64	4.1	.00	.00	81
24	51	91	49	23	41	1930	223	52	.00	.00	.00	71
25	52	94	48	22	46	1580	201	50	.00	.00	.00	68
26	45	101	45	23	44	1420	194	55	.11	.00	.00	56
27	56	112	43	23	45	1260	175	48	4.6	.00	.00	58
28	57	111	41	22	49	1040	166	38	.11	.00	.00	50
29	64	109	40	21	---	961	153	43	.00	.00	.00	50
30	65	107	39	18	---	761	181	48	.00	.00	.00	43
31	65	---	38	18	---	707	---	54	---	.00	.00	---
TOTAL	1556	2887	2272	804	638	23801	9954	3072	807.92	.02	.00	1846.10
MEAN	50.2	96.2	73.3	25.9	22.8	768	332	99.1	26.9	.00	.00	61.5
MAX	69	112	110	36	49	1970	596	173	57	.02	.00	102
MIN	18	73	38	18	13	39	153	38	.00	.00	.00	.00
AC-FT	309	5730	4510	1590	1270	47210	19740	6090	1600	.04	.00	3660
CAL YR 1984	TOTAL	156894		MEAN	429	MAX	3290	MIN	18	AC-FT	311200	
WTR YR 1985	TOTAL	47638.04		MEAN	131	MAX	1970	MIN	.00	AC-FT	94490	

## JAMES RIVER BASIN

06476000 JAMES RIVER AT HURON, SD--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1948 to September 1952, October 1955 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1956 to October 1970, September 1971 to current year.

WATER TEMPERATURE: September 1956 to October 1970, September 1971 to current year.

REMARKS.--Samples collected once daily by observer.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,170 microsiemens, Mar. 14, 1965; minimum daily, 175 microsiemens, Mar. 30, Apr. 2, 1960.

WATER TEMPERATURE: Maximum daily, 31.0°C, June 2, 1968; minimum daily, 0.0°C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum observed daily, 1,780 microsiemens, Feb. 15; minimum observed daily, 500 microsiemens, Mar. 28.

WATER TEMPERATURE: Maximum observed daily, 21.0°C, Sept. 5-7; minimum observed daily, 0.0°C on many days during winter flow period.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT 1984										
29...	14:30	62	1080	8.7	15.5	8.0	360	74	75	41
NOV										
19...	15:45	99	990	8.7	0.0	2.0	320	17	69	37
DEC										
11...	14:15	92	1200	8.8	3.0	2.5	390	83	79	46
JAN 1985										
28...	15:00	30	1630	8.4	-6.0	1.0	560	130	120	63
FEB										
12...	14:30	24	1840	8.2	-7.0	2.0	650	170	140	72
MAR										
18...	11:50	1590	--	--	--	--	--	--	--	--
26...	14:45	1500	530	7.9	14.5	7.5	170	76	37	19
APR										
29...	14:00	130	1040	8.6	25.0	16.0	330	110	72	37
MAY										
22...	13:00	48	1110	8.5	24.0	20.0	370	120	79	42
SEP										
18...	13:30	90	1160	8.8	30.0	23.0	370	110	77	43

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY LAB (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)
OCT 1984									
29...	100	37	2	15	282	240	45	0.3	15
NOV									
19...	97	38	2	15	308	160	51	0.3	16
DEC									
11...	120	39	3	17	304	260	59	0.3	8.2
JAN 1985									
28...	150	36	3	24	431	410	71	0.3	13
FEB									
12...	180	37	3	24	473	410	78	0.3	17
MAR									
18...	--	--	--	--	--	--	--	--	--
26...	50	36	2	16	95	140	27	0.1	11
APR									
29...	99	38	2	18	226	250	48	0.3	4.5
MAY									
22...	110	38	3	18	248	260	55	0.3	8.0
SEP									
18...	120	40	3	18	258	290	60	0.2	14

## JAMES RIVER BASIN

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06476Q00 JAMES RIVER AT HURON, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, TOTAL (MG/L AS P04)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)
OCT 1984									
29...	700	0.95	117	<0.10	0.26	--	0.17	260	0.05
NOV									
19...	630	0.86	169	<0.10	0.31	--	0.23	200	0.20
DEC									
11...	770	1.1	192	<0.10	0.21	--	0.16	220	0.14
JAN 1985									
28...	1100	1.5	90	<0.10	0.33	--	0.16	320	0.14
FEB									
12...	1200	1.6	78	<0.10	0.41	--	0.20	350	0.17
MAR									
18...	--	--	--	--	--	--	--	--	--
26...	360	0.49	1450	0.89	0.47	--	0.30	140	0.24
APR									
29...	660	0.9	233	<0.10	0.26	--	0.09	230	0.05
MAY									
22...	720	0.98	94	<0.10	0.29	0.89	0.13	270	0.09
SEP									
18...	780	1.1	189	<0.10	0.40	1.2	0.24	320	0.16

SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25°C, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	1160	960	1280	1600	1050	700	1080	1170			---
2	1000	1140	900	1280	1620	1160	720	1110	1170			---
3	1010	1120	970	1300	1610	1150	760	1120	1180			---
4	1010	1120	980	1330	1650	1150	780	1110	1180			---
5	1010	1120	1020	1320	1630	1150	800	1120	1200			1280
6	1000	1100	1160	1290	1650	1150	800	1120	1200			1300
7	1000	1120	1180	1320	1700	1160	800	1120	1200			1270
8	1000	1130	1180	1320	1700	1130	810	1150	1200			1280
9	1000	1080	1180	1320	1680	1120	800	1150	1230			1260
10	990	1080	1160	1340	1700	1130	800	1120	1220			1280
11	1000	1000	1160	1360	1690	1140	820	1100	1240			1300
12	1010	1010	1160	1340	1730	1140	810	1100	1240			1300
13	990	1000	1160	1380	1740	1130	830	1120	1260			1210
14	990	1000	1170	1370	1750	1120	850	1130	1270			1190
15	990	1010	1180	1380	1780	1120	860	1100	1260			1190
16	990	1030	1180	1400	1750	1120	860	1120	1280			1190
17	980	1020	1160	1430	1760	550	860	1100	1280			1190
18	1000	1020	1160	1440	1750	590	840	1100	1290			1190
19	990	1020	1170	1440	---	790	850	1100	1300			1190
20	980	1030	1170	1440	---	850	880	1120	---			1190
21	980	1040	1200	1460	1750	710	890	1160	---			1200
22	1000	1080	1170	1480	1750	620	910	1140	---			1200
23	1030	1080	1180	1530	1750	600	910	1160	---			1140
24	1020	1080	1180	1520	1750	620	910	1160	---			1120
25	1040	1100	1240	1550	1750	730	900	1160	---			1160
26	1060	1080	1240	1530	1020	550	940	1160	---			1150
27	1100	1080	1220	1550	1020	580	950	1160	---			1160
28	1100	1060	1250	1530	1160	500	1010	1160	---			---
29	1100	1060	1240	1530	---	580	1050	1180	---			---
30	1120	1050	1240	1540	---	640	1060	1170	---			---
31	1160	---	1260	1560	---	640	---	1160	---			---



## JAMES RIVER BASIN

06476000 JAMES RIVER AT HURON, SD--Continued

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
ONCE-DAILY

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

## 06476500 SAND CREEK NEAR ALPENA, SD

LOCATION.--Lat 44°09'15", long 98°26'06", in NE¼ sec.19, T.108 N., R.63 W., Jerauld County, Hydrologic Unit 10160006, on left bank 5 ft downstream from highway bridge, 4.0 mi southwest of Alpena, 7.0 mi upstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, and 10.5 mi upstream from interlink with Cain Creek.

DRAINAGE AREA.--240 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--March 1950 to current year.

REVISED RECORDS.--WSP 1309: 1950(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,315 ft. Prior to Sept. 17, 1951, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Jan. 4 to Mar. 17, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--35 years, 8.33 ft<sup>3</sup>/s (6,040 acre-ft/yr); median of yearly mean discharges, 5.4 ft<sup>3</sup>/s (3,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,240 ft<sup>3</sup>/s Mar. 28, 1960 (gage height, 13.35 ft); maximum gage height, 14.1 ft Mar. 28, 1950 (backwater from ice); no flow for many days in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 20	1015	*556	*11.34	No other peak greater than base discharge.			
No flow for many days.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.49	.65	.04	.00	.92	12	2.1	.77	.00	.00	.00
2	.00	.51	.64	.02	.00	.64	11	2.4	.88	.00	.00	.00
3	.00	.54	.64	.00	.00	.54	11	2.7	1.0	.00	.00	.00
4	.00	.62	.54	.00	.00	.46	9.8	2.7	1.5	.00	.00	.00
5	.00	.61	.49	.00	.00	.48	9.3	2.2	1.3	.00	.00	.00
6	.00	.59	.40	.00	.00	.52	8.8	1.9	.79	.00	.00	.00
7	.00	.64	.34	.00	.00	.56	8.3	1.5	.71	.00	.00	.00
8	.00	.69	.34	.00	.00	.62	7.6	1.4	2.1	.00	.00	.00
9	.00	.72	.38	.00	.00	.71	7.4	1.4	2.2	.00	.00	.00
10	.00	.61	.46	.00	.00	.84	6.8	1.2	.15	.00	.00	.00
11	.00	.59	.54	.00	.00	1.1	6.3	.97	.41	.00	.00	.00
12	.00	.59	.65	.00	.00	2.0	5.6	.24	.29	.00	.00	.00
13	.00	.68	.69	.00	.00	5.2	4.9	.04	.24	.00	.00	.00
14	.00	.72	.69	.00	.00	9.4	5.1	.06	.24	.00	.00	.00
15	.00	.53	.69	.00	.00	30	4.7	.59	.25	.00	.00	.00
16	.00	.38	.69	.00	.01	120	4.3	.67	.33	.00	.00	.00
17	.00	.34	.66	.00	.06	370	3.9	.63	.08	.00	.00	.00
18	.03	.34	.47	.00	.22	324	3.4	.58	.00	.00	.00	.00
19	.24	.33	.37	.00	.49	407	3.1	.49	.01	.00	.00	.00
20	.25	.31	.31	.00	4.6	507	3.1	.29	.02	.00	.00	.00
21	.31	.33	.31	.00	4.5	326	2.8	.21	.01	.00	.00	.00
22	.33	.38	.29	.00	4.1	199	2.9	.25	.00	.00	.00	.00
23	.31	.48	.23	.00	3.6	121	3.5	.10	.00	.00	.00	.00
24	.32	.57	.19	.00	3.2	75	3.4	.13	.00	.00	.00	.00
25	.34	.68	.13	.00	2.7	46	3.3	.32	.00	.00	.00	.00
26	.45	.89	.11	.00	2.4	28	3.2	.09	.00	.00	.00	.00
27	.69	.83	.10	.00	2.2	24	3.3	.04	.00	.00	.00	.00
28	.74	.75	.11	.00	1.4	21	3.1	.06	.00	.00	.00	.00
29	.79	.69	.11	.00	---	16	2.8	1.5	.00	.00	.00	.00
30	.70	.69	.08	.00	---	15	2.3	1.8	.00	.00	.00	.00
31	.69	---	.06	.00	---	13	---	1.4	---	.00	.00	---
TOTAL	6.19	17.12	12.36	.06	29.48	2665.99	167.0	29.96	13.28	.00	.00	.00
MEAN	.20	.57	.40	.00	1.05	86.0	5.57	.97	.44	.00	.00	.00
MAX	.79	.89	.69	.04	4.6	507	12	2.7	2.2	.00	.00	.00
MIN	.00	.31	.06	.00	.00	.46	2.3	.04	.00	.00	.00	.00
AC-FT	1	34	25	.1	58	5290	331	59	26	.00	.00	.00
CAL YR 1984	TOTAL	5033.04		MEAN	13.8	MAX	226	MIN	.00	AC-FT	9980	
WTR YR 1985	TOTAL	2941.44		MEAN	8.06	MAX	507	MIN	.00	AC-FT	5830	

## JAMES RIVER BASIN

06477000 JAMES RIVER NEAR FORESTBURG, SD

LOCATION.--Lat 43°58'26", long 98°04'14", in SW¼SW¼NW¼ sec.20, T.106 N., R.60 W., Sanborn County, Hydrologic Unit 10160011, on right bank 5.0 ft downstream from highway bridge, 3.8 mi southeast of Forestburg, 5.4 mi downstream from Chicago, Milwaukee, St. Paul and Pacific Railroad bridge, and 6.1 mi downstream from Sand Creek.

DRAINAGE AREA.--17,400 mi<sup>2</sup>, approximately, of which about 5,110 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--March 1950 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,208.34 ft above National Geodetic Vertical Datum of 1929 (Bureau of Reclamation bench mark). Prior to Sept. 5, 1951, nonrecording gage at same site and datum.

REMARKS.--Records good except those for winter period, Nov. 27 to Mar. 18, which are poor. Low flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973. Several observations of water temperature and specific conductance were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--35 years, 278 ft<sup>3</sup>/s (201,400 acre-ft/yr); median of yearly mean discharges, 150 ft<sup>3</sup>/s (108,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,500 ft<sup>3</sup>/s Apr. 9, 1969 (gage height, 17.16 ft); no flow at times in 1950, 1955, 1959, 1961, 1970, 1976, 1977, 1981, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in March 1920 and March 1922 reached a stage of about 18 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,330 ft<sup>3</sup>/s at 1830 hours, Mar. 20 (gage height, 13.55 ft); minimum daily discharge, 3.8 ft<sup>3</sup>/s Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	89	100	38	8.0	50	1090	216	164	15	17	5.4
2	49	86	100	36	7.0	50	928	207	237	13	14	5.7
3	46	89	95	36	7.0	45	810	192	247	13	11	6.7
4	42	101	95	35	7.0	50	743	173	232	11	9.3	6.3
5	40	107	95	35	7.0	55	684	168	209	11	7.5	7.0
6	44	108	90	35	7.0	70	644	166	190	11	6.6	7.7
7	48	108	90	35	7.0	90	615	160	157	10	6.0	8.4
8	48	109	85	35	7.0	100	585	147	130	9.0	5.4	28
9	51	112	85	30	7.0	100	554	130	111	7.9	4.5	64
10	50	116	80	25	7.0	90	514	122	101	7.2	4.1	78
11	46	119	80	25	8.0	95	486	121	92	6.9	3.8	77
12	38	117	80	20	8.0	100	464	124	84	6.8	6.7	89
13	33	123	75	20	9.0	120	438	122	82	6.7	7.4	97
14	30	124	70	20	10	150	430	161	77	7.0	12	100
15	33	123	70	20	11	400	404	271	72	7.4	15	110
16	44	120	70	20	12	1000	377	297	66	7.1	15	115
17	55	120	65	20	13	2200	351	265	54	6.7	14	115
18	63	127	65	20	15	2700	334	223	52	6.6	11	115
19	81	114	60	15	16	3150	337	202	47	6.4	9.1	115
20	100	119	60	15	18	3290	337	182	39	6.4	8.1	114
21	104	123	55	15	20	3270	342	155	37	8.1	7.4	110
22	105	118	55	10	25	3190	348	138	33	10	6.7	107
23	105	120	50	10	30	3100	361	145	27	11	11	113
24	103	123	45	10	35	3020	363	117	22	13	9.4	114
25	100	116	45	10	40	2940	335	110	18	13	9.7	109
26	95	113	45	10	45	2820	305	99	20	14	8.7	103
27	89	110	40	10	50	2610	286	85	20	13	7.5	97
28	88	110	40	10	50	2310	265	78	19	12	6.9	88
29	87	100	40	10	---	1940	248	105	18	13	6.2	82
30	91	100	40	10	---	1570	230	124	17	18	6.1	75
31	96	---	38	9.0	---	1300	---	126	---	18	5.8	---
TOTAL	2058	3364	2103	649.0	486.0	41975	14208	4931	2674	319.2	272.9	2262.2
MEAN	66.4	112	67.8	20.9	17.4	1354	474	159	89.1	10.3	8.80	75.4
MAX	105	127	100	38	50	3290	1090	297	247	18	17	115
MIN	30	86	38	9.0	7.0	45	230	78	17	6.4	3.8	5.4
AC-FT	408	6670	4170	1290	964	83260	28180	9780	5300	633	541	4490
CAL YR 1984	TOTAL	219209		MEAN	599	MAX	6030	MIN	17	AC-FT	434800	
WTR YR 1985	TOTAL	75302.3		MEAN	206	MAX	3290	MIN	3.8	AC-FT	149400	

## 06477500 FIRESTEEL CREEK NEAR MOUNT VERNON, SD

LOCATION.--Lat 43°46'30", long 98°14'33", in SW¼SW¼ sec.26, T.104 N., R.62 W., Davison County, Hydrologic Unit 10160011, near center of span on downstream side of highway bridge, 4.5 mi north of Mount Vernon, 5.2 mi downstream from West Firesteel Creek, and 12 mi northwest of Mitchell.

DRAINAGE AREA.--540 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--September 1955 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,297.22 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 28, 1972, nonrecording gage and crest-stage gage.

REMARKS.--Records good except those for winter period, Jan. 20 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--30 years, 22.9 ft<sup>3</sup>/s (16, 590 acre-ft/yr); median of yearly mean discharges, 9.3 ft<sup>3</sup>/s (6,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,610 ft<sup>3</sup>/s Apr. 4, 1969 (gage height, 15.34 ft); maximum gage height, 17.12 ft Apr. 3, 1969 (backwater from ice); no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	1530	*3,700	a*13.41	No other peak greater than base discharge.			

a Backwater from ice.

Minimum daily discharge, 0.02 ft<sup>3</sup>/s July 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	2.0	2.2	.81	.60	20	38	9.8	11	.73	.19	.34
2	1.3	2.0	2.1	.79	.50	15	34	8.1	8.2	.57	.16	.42
3	1.3	1.9	1.9	.87	.40	10	30	7.0	17	.48	.12	1.3
4	1.3	2.0	1.7	.93	.30	8.0	42	6.2	23	.42	.10	3.4
5	1.3	2.2	1.6	.98	.20	5.0	50	5.5	22	.35	.08	1.5
6	1.7	2.2	1.4	1.1	.20	5.0	50	4.9	19	.31	.09	.57
7	2.0	2.2	1.3	1.1	.20	5.0	48	4.1	16	.24	.06	.71
8	2.1	2.1	1.3	1.1	.20	5.0	41	3.9	14	.19	.09	2.3
9	1.9	2.1	1.4	1.1	.20	5.0	35	3.4	10	.15	.08	1.9
10	1.7	2.1	1.4	1.1	.20	5.0	30	3.4	8.3	.10	.08	1.3
11	1.6	2.0	1.5	1.1	.20	5.0	27	3.2	8.3	.08	.06	.93
12	1.5	1.9	1.5	1.0	.20	5.0	25	3.0	6.4	.08	.71	1.0
13	1.4	1.9	1.5	.98	.20	5.0	22	2.5	5.4	.06	.30	1.2
14	1.3	2.0	1.5	1.1	.25	7.0	19	2.4	5.0	.08	.13	1.2
15	2.0	2.0	1.5	1.0	.30	100	19	3.2	4.4	.10	.11	1.1
16	2.2	1.8	1.5	1.0	.40	2000	17	3.9	3.4	.19	.29	1.0
17	2.1	1.7	1.5	1.1	.70	1890	14	4.0	3.1	.15	.28	.94
18	3.2	1.7	1.3	1.1	1.5	1230	12	3.6	2.8	.08	.12	.92
19	8.1	1.7	1.2	1.1	3.0	795	11	3.1	2.6	.05	.12	.83
20	8.8	1.6	1.2	1.0	5.0	555	14	2.6	2.3	.03	.10	.50
21	7.6	2.0	1.1	1.0	3.3	408	14	2.2	2.0	.02	.21	.44
22	4.8	1.8	1.2	1.0	2.2	293	15	2.1	1.6	.02	.32	.46
23	3.8	1.8	1.6	1.0	1.7	213	17	1.9	1.2	.03	1.4	.38
24	3.1	1.8	1.5	1.0	2.5	165	17	1.6	.90	.12	1.9	.29
25	3.0	1.8	1.3	1.0	4.3	131	17	1.3	.81	.14	1.2	.28
26	3.2	2.1	1.2	1.0	6.4	104	14	1.3	1.2	.09	.72	.26
27	2.6	2.6	1.1	1.0	5.9	92	14	1.3	1.2	.06	.46	.28
28	2.3	3.0	1.2	1.0	11	75	13	1.1	1.1	.04	.31	.31
29	2.3	2.2	1.1	1.0	---	63	12	9.7	.93	.05	.31	.42
30	2.2	2.2	.99	.90	---	56	11	13	.80	.06	.48	.35
31	2.1	---	.88	.70	---	46	---	14	---	.17	.42	---
TOTAL	85.2	60.4	43.67	30.96	52.05	8321.0	722	137.3	203.94	5.24	11.00	26.83
MEAN	2.75	2.01	1.41	1.00	1.86	268	24.1	4.43	6.80	.17	.35	.89
MAX	8.8	3.0	2.2	1.1	11	2000	50	14	23	.73	1.9	3.4
MIN	1.3	1.6	.88	.70	.20	5.0	11	1.1	.80	.02	.06	.26
AC-FT	16	120	87	61	103	16500	1430	272	405	10	22	53
CAL YR 1984	TOTAL	41798.97		MEAN	114	MAX	4200	MIN	.10	AC-FT	82910	
WTR YR 1985	TOTAL	9699.59		MEAN	26.6	MAX	2000	MIN	.02	AC-FT	19240	

## JAMES RIVER BASIN

06478052 ENEMY CREEK NEAR MITCHELL, SD

LOCATION.--Lat 43°38'33", long 97°59'09", in NW¼NW¼ sec.13, T.102 N., R.60 W., Davison County, Hydrologic Unit 10160011, on left bank 3 ft downstream from highway bridge, 4.5 mi southeast of Mitchell, and 7.3 mi upstream from mouth.

DRAINAGE AREA.--181 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1975 to current year.

REVISED RECORDS.--WDR SD-78-1: 1977.

GAGE.--Water-stage recorder. Elevation of gage is 1,280 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Nov. 29 to Mar. 15, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--10 years, 12.6 ft<sup>3</sup>/s (9,130 acre-ft/yr); median of yearly mean discharges, 1.6 ft<sup>3</sup>/s (1,200 acre-ft/yr).

EXTREMES FSOR PERIOD OF RECORD.--Maximum discharge, 4,280 ft<sup>3</sup>/s June 22, 1984 (gage height, 15.15 ft); no flow for many days in each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 22	1445	40	a6.47	May 12	1300	216	7.42
Mar. 15	2115	*550	*9.68	May 31	1145	138	6.88
Apr. 4	2130	75	6.31	Sept. 4	2115	55	6.16
Apr. 24	0315	37	5.88				

a Backwater from ice.

No flow July 19, 20, Aug. 6-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	4.0	2.0	.30	.10	11	10	13	82	.44	.03	.12
2	.19	3.8	2.0	.30	.10	10	10	12	51	.37	.03	.14
3	.18	4.2	2.0	.29	.10	5.6	9.8	12	34	.34	.03	.15
4	.21	4.3	1.5	.31	.08	7.0	47	10	26	.34	.02	2.9
5	.23	4.1	1.5	.33	.08	5.3	72	9.2	20	.27	.01	3.0
6	1.0	3.7	1.1	.32	.07	1.6	60	8.4	15	.16	.00	.77
7	1.5	3.9	1.1	.27	.07	1.7	40	7.3	12	.13	.00	.42
8	1.8	3.7	1.1	.22	.07	2.7	29	6.8	8.8	.13	.00	.29
9	4.1	3.8	1.1	.22	.07	4.5	23	6.5	6.7	.11	.00	.32
10	3.5	3.3	1.3	.20	.07	5.2	21	5.8	5.7	.08	.00	.30
11	3.2	2.8	1.5	.19	.07	13	19	8.9	6.0	.06	.00	.29
12	3.0	2.8	1.6	.17	.07	21	17	170	5.9	.06	.16	.45
13	2.7	2.9	1.6	.16	.07	85	15	85	5.5	.03	.28	.97
14	2.7	3.3	1.5	.15	.10	165	15	42	4.4	.04	.13	.98
15	5.2	3.2	1.5	.15	.11	353	14	39	3.4	.04	.10	.77
16	6.7	2.7	1.5	.10	.15	410	13	42	2.8	.03	.09	.67
17	8.3	2.5	1.0	.10	.50	266	12	30	2.5	.03	.08	.58
18	9.1	2.7	1.0	.10	1.0	141	14	23	1.8	.01	.07	.60
19	13	2.6	.70	.10	1.5	92	15	17	1.7	.00	.06	.49
20	13	2.3	.70	.10	2.5	67	15	13	1.5	.00	.05	.51
21	12	2.2	.60	.10	20	51	14	9.8	1.2	.02	.03	.54
22	12	2.3	.60	.10	25	39	13	8.9	1.0	.03	.03	.54
23	9.7	2.5	.50	.10	20	32	24	7.5	.85	.03	.09	.52
24	8.7	2.7	.50	.10	12	25	35	6.3	.56	.17	.13	.44
25	7.6	3.3	.40	.10	10	21	28	5.6	.41	.23	.13	.38
26	7.2	3.6	.40	.10	5.0	18	23	5.0	.83	.16	.12	.38
27	6.6	3.6	.40	.10	3.9	16	21	4.8	.93	.11	.11	.36
28	5.7	3.3	.40	.10	4.9	15	20	4.3	.86	.07	.10	.29
29	5.1	3.0	.30	.10	---	13	17	29	.67	.06	.10	.34
30	4.7	2.5	.30	.10	---	12	15	70	.58	.05	.11	.32
31	4.5	---	.30	.10	---	12	---	123	---	.04	.12	---
TOTAL	163.61	95.6	32.00	5.18	107.68	1921.6	680.8	835.1	304.59	3.64	2.21	18.83
MEAN	5.28	3.19	1.03	.17	3.85	62.0	22.7	26.9	10.2	.12	.07	.63
MAX	13	4.3	2.0	.33	25	410	72	170	82	.44	.28	3.0
MIN	.18	2.2	.30	.10	.07	1.6	9.8	4.3	.41	.00	.00	.12
AC-FT	32	190	63	10	214	3810	1350	1660	604	7.2	4.4	37
CAL YR 1984	TOTAL	28448.48		MEAN	77.7	MAX	3750	MIN	.12	AC-FT	56430	
WTR YR 1985	TOTAL	4170.84		MEAN	11.4	MAX	410	MIN	.00	AC-FT	8270	



## 06478390 WOLF CREEK NEAR CLAYTON, SD

LOCATION.--Lat 43°22'18", long 97°36'12", in NW¼NE¼ sec.29, T.99 N., R.57 W., Hutchinson County, Hydrologic Unit 10160011, on right bank 10 ft downstream from highway bridge, 4.1 mi upstream from mouth, and 5.6 mi south-east of Clayton.

DRAINAGE AREA.--386 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1975 to current year.

GAGE.--Water-stage recorder to Sept. 30, 1981. Nonrecording gage Oct. 1-30, 1981. Water-stage recorder Oct. 31, 1981, to current year. Elevation of gage is 1,210 ft above National Geodetic Vertical Datum of 1929, from topographic map. Oct. 1, 1975, to July 29, 1980, recording gage 50 ft upstream at different datum.

REMARKS.--Records good except those for winter period, Nov. 27 to Feb. 28, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--10 years, 37.8 ft<sup>3</sup>/s (27,390 acre-ft/yr); median of yearly mean discharge, 21 ft<sup>3</sup>/s (15,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,520 ft<sup>3</sup>/s June 21, 1984 (gage height, 18.01 ft); no flow at times in 1976, 1977, 1980-82.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 175 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	0415	*896	*10.14	No other peak greater than base discharge.			

Minimum daily discharge, 1.5 ft<sup>3</sup>/s Feb. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	11	8.0	4.0	2.0	33	43	38	32	3.8	3.1	5.0
2	9.5	8.3	6.1	4.0	2.0	26	40	33	25	3.7	2.8	5.0
3	9.5	9.5	8.0	4.0	1.5	31	38	29	19	3.4	3.0	4.8
4	9.5	10	8.0	4.0	1.5	30	64	25	17	3.3	2.9	4.9
5	10	12	8.0	4.0	2.0	30	100	23	14	3.0	2.7	12
6	14	13	8.0	4.0	2.0	30	82	21	12	3.0	2.7	8.4
7	14	13	9.0	4.0	2.0	44	68	19	10	2.9	2.4	5.9
8	11	13	10	4.0	2.0	81	57	17	9.2	2.8	2.6	5.2
9	13	13	9.0	3.5	2.0	113	49	14	7.6	2.7	2.3	5.2
10	12	13	8.0	3.5	2.5	165	43	13	8.2	2.5	2.6	5.3
11	12	15	8.0	3.5	3.0	239	40	13	9.7	2.4	2.5	5.4
12	13	12	8.0	3.5	3.5	327	38	12	9.0	2.6	5.1	6.5
13	12	13	8.0	3.5	3.5	319	35	10	7.8	2.7	4.3	18
14	12	13	8.0	3.5	3.5	497	34	16	7.1	3.1	3.6	17
15	23	12	8.0	3.5	3.5	747	31	19	6.6	3.1	3.2	11
16	27	10	8.0	3.5	3.5	824	26	20	6.4	2.9	3.8	9.4
17	21	9.3	8.0	3.5	6.0	700	24	18	5.6	2.7	5.9	7.9
18	19	11	7.0	3.5	10	582	22	15	5.1	2.6	4.3	6.6
19	29	9.1	6.0	3.0	25	471	21	12	5.0	2.4	3.6	6.2
20	28	9.1	6.0	3.0	50	332	23	10	4.8	2.2	3.5	5.8
21	21	11	6.0	3.0	90	225	24	9.0	4.3	2.8	3.7	5.4
22	18	8.9	6.0	3.0	75	161	31	8.2	3.9	2.9	3.5	6.1
23	15	8.7	6.0	2.5	65	127	80	9.2	3.6	2.5	6.3	6.0
24	13	8.7	5.0	2.5	55	102	113	9.1	3.4	11	6.8	5.6
25	14	8.7	5.0	2.5	47	83	89	8.2	3.4	7.9	5.8	5.7
26	14	8.7	5.0	2.5	40	67	79	7.7	6.9	4.7	5.4	5.4
27	13	8.5	5.0	2.5	45	62	73	7.4	6.5	3.5	5.4	5.4
28	12	8.5	5.0	2.5	45	54	60	7.2	5.3	3.1	6.8	5.2
29	12	7.5	4.5	2.0	---	48	48	62	4.5	2.9	19	5.2
30	12	8.0	4.0	2.0	---	44	42	79	4.0	3.0	6.4	5.2
31	11	---	4.0	2.0	---	43	---	42	---	3.4	5.4	---
TOTAL	462.2	316.5	212.6	100.0	593.0	6637	1517	626.0	266.9	105.5	141.4	210.7
MEAN	14.9	10.5	6.86	3.23	21.2	214	50.6	20.2	8.90	3.40	4.56	7.02
MAX	29	15	10	4.0	90	824	113	79	32	11	19	18
MIN	8.7	7.5	4.0	2.0	1.5	26	21	7.2	3.4	2.2	2.3	4.8
AC-FT	91	628	422	198	1180	13160	3010	1240	529	209	280	418
CAL YR 1984	TOTAL	59526.2		MEAN	163	MAX	4420	MIN	4.0	AC-FT	118100	
WTR YR 1985	TOTAL	11188.8		MEAN	30.7	MAX	824	MIN	1.5	AC-FT	22190	

## JAMES RIVER BASIN

06478500 JAMES RIVER NEAR SCOTLAND, SD  
(National stream-quality accounting network station)

LOCATION.--Lat 43°11'09", long 97°38'07", in SW¼SW¼ sec.30, T.97 N., R.57 W., Hutchinson County, Hydrologic Unit 10160011, on right bank 5.0 ft downstream from highway bridge, 0.3 mi upstream from Dawson Creek, and 5.2 mi northeast of Scotland.

DRAINAGE AREA.--20,300 mi<sup>2</sup>, approximately, of which about 5,110 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1928 to current year. Monthly discharge only for some periods, published in WSP 1309.

REVISED RECORDS.--WSP 786: Drainage area. WSP 956: 1937-38. WSP 1279: 1932, 1948. WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder and rock and earth control. Datum of gage is 1,168.07 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 28, 1972, at site 0.25 mi downstream at present datum.

REMARKS.--Records good except those for winter periods, Jan. 20, 21 and Feb. 20 to Mar. 11, which are poor. Low flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973. Occasional backwater caused by Dawson Creek; reverse flow occurred for part of May 15, 1961, from information by local residents. National Weather Service gage-height tele-meter and U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--57 years, 396 ft<sup>3</sup>/s (286,900 acre-ft/yr); median of yearly mean discharges, 210 ft<sup>3</sup>/s (152,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft<sup>3</sup>/s June 23, 1984 (gage height, 20.45 ft); no flow for many days in some years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,110 ft<sup>3</sup>/s at 1015 hours, Mar. 27 (gage height, 13.98 ft); minimum daily discharge, 27 ft<sup>3</sup>/s July 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	130	174	184	83	46	160	3670	597	623	67	38	182
2	133	166	168	71	42	160	3470	532	601	65	38	110
3	130	150	120	70	39	170	3260	466	524	60	35	79
4	119	146	154	73	38	140	3080	404	444	58	35	64
5	117	161	160	74	35	100	2900	373	394	52	34	68
6	120	172	126	75	36	150	2700	359	376	51	35	64
7	141	176	127	74	33	200	2460	345	371	44	36	63
8	152	175	136	73	35	400	2150	305	367	37	35	83
9	154	179	152	72	35	700	1760	255	352	36	32	87
10	154	188	167	72	31	900	1410	219	321	37	29	80
11	151	193	177	68	30	950	1140	209	298	36	30	66
12	142	179	178	64	32	1100	986	208	271	32	40	58
13	141	167	156	67	32	1150	899	215	235	31	42	74
14	141	179	163	68	31	1250	847	532	212	33	44	93
15	202	202	168	66	31	1510	801	680	192	36	47	118
16	283	204	184	69	35	1770	748	579	179	34	49	137
17	268	201	171	69	47	2000	700	497	161	30	64	153
18	249	192	150	67	69	2150	663	470	152	29	62	168
19	325	196	146	65	87	2290	620	468	137	28	54	174
20	368	193	142	65	130	2450	588	461	124	27	50	175
21	370	168	142	65	250	2590	618	425	111	31	49	164
22	351	182	134	65	300	2750	647	365	101	35	42	163
23	330	185	127	61	240	2980	867	325	92	34	45	161
24	300	181	116	66	200	3330	1170	282	78	37	50	169
25	285	181	111	59	200	3800	1150	242	72	50	54	164
26	264	178	109	57	190	4020	1020	220	83	68	51	157
27	262	202	106	59	170	4080	920	205	98	53	50	157
28	254	217	105	53	150	4030	818	192	96	41	50	155
29	236	216	101	54	---	3950	718	220	83	38	104	162
30	203	201	95	53	---	3890	643	452	73	38	459	164
31	187	---	88	45	---	3820	---	576	---	38	330	---
TOTAL	6662	5504	4363	2042	2594	58940	43423	11678	7221	1286	2113	3712
MEAN	215	183	141	65.9	92.6	1901	1447	377	241	41.5	68.2	124
MAX	370	217	184	83	300	4080	3670	680	623	68	459	182
MIN	117	146	88	45	30	100	588	192	72	27	29	58
AC-FT	1321	10920	8650	4050	5150	116900	86130	23160	14320	2550	4190	7360
CAL YR 1984	TOTAL	619370		MEAN	1692	MAX	27600	MIN	60	AC-FT	1229000	
WTR YR 1985	TOTAL	149538		MEAN	410	MAX	4080	MIN	27	AC-FT	296600	

06478500 JAMES RIVER NEAR SCOTLAND, SD--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1955 to September 1964, October 1966 to September 1973, October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to Sept. 30, 1981, June to August 1985.

pH: June to August 1985.

WATER TEMPERATURE: January 1953 to September 1969, October 1974 to Sept. 30, 1983, June to August 1985.

DISSOLVED OXYGEN: June to August 1985.

SUSPENDED-SEDIMENT DISCHARGE: Oct. 1, 1981, to Sept. 30, 1983.

REMARKS.--Prior to October 1969, continuous temperature thermograph at station. From June to August 1985, four-parameter mini-monitor with hourly readings at station.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,660 microsiemens, Jan. 9, 1977; minimum daily, 300 microsiemens, Mar. 19, 1977.

WATER TEMPERATURE: Maximum, 32.0°C, Aug. 1, 2, 1957; minimum daily, 0.0°C on many days during winter periods.

SEDIMENT CONCENTRATION: Maximum daily mean, 953 mg/L, June 21, 1983; minimum daily mean, 12 mg/L, Nov. 8, 1982.

SEDIMENT LOAD: Maximum daily, 5,890 tons, June 21, 1983; minimum daily, 1.7 tons, Oct. 2, 11, 1981.

pH: Maximum daily, 8.6, June 17, 19, 20, 1985; minimum daily, 7.5, June 30, 1985, July 2, 1985.

DISSOLVED OXYGEN: Maximum daily, 16.3 mg/L, June 30, 1985; minimum daily, 1.0 mg/L, June 27, 1985.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

		STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI KF AGAR (COLS. PER 100 ML)	
DATE	TIME												
NOV 1984													
13...	15:25	166	1820	8.3	15.0	2.0	14	724	13.8	106	K12	180	
DEC													
10...	16:00	172	1690	7.8	9.0	1.0	7.2	--	--	--	--	--	
JAN 1985													
14...	14:30	71	2000	7.8	-8.0	0.5	6.2	738	13.6	98	--	--	
FEB													
19...	13:50	82	1950	7.7	8.0	0.5	6.4	732	17.6	128	460	TNTC	
MAR													
28...	15:00	4060	636	8.6	--	10.0	28	718	12.8	121	--	--	
APR													
29...	14:15	715	1520	8.2	21.5	17.0	37	728	9.8	107	--	--	
MAY													
21...	14:10	412	1230	8.5	26.0	21.0	35	730	12.2	144	K62	K44	
JUN													
18...	13:05	160	1460	8.4	21.0	20.5	34	733	8.3	96	--	--	
JUL													
15...	13:00	36	1630	8.5	27.5	28.0	12	735	7.9	105	--	--	
AUG													
13...	12:00	41	1650	8.4	20.5	23.0	20	730	8.2	100	170	340	
29...	12:00	63	1820	8.1	26.0	23.0	--	727	6.8	84	--	--	
SEP													
09...	13:10	87	1200	7.9	16.0	21.0	24	733	3.5	41	--	--	
DATE		HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 1984													
13...	830	570	200	81	120	23	2	15	268	690	49	0.4	
DEC													
10...	730	370	170	73	120	26	2	15	351	570	48	--	
JAN 1985													
14...	900	500	210	90	140	25	2	17	396	730	62	--	
FEB													
19...	880	510	210	85	110	21	2	18	367	700	49	0.4	
MAR													
28...	220	97	53	22	38	25	1	15	126	180	17	--	
APR													
29...	670	450	150	72	98	23	2	19	221	620	44	--	
MAY													
21...	550	350	130	54	81	24	2	15	202	480	35	0.3	
JUN													
18...	570	350	130	60	100	27	2	17	220	510	40	--	
JUL													
15...	710	470	160	75	100	23	2	16	336	580	39	--	
AUG													
13...	760	530	170	81	100	22	2	18	227	700	40	0.3	
SEP													
09...	540	380	130	52	53	17	1	13	160	460	20	--	

## JAMES RIVER BASIN

06478500 JAMES RIVER NEAR SCOTLAND, SD--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 1984												
13...	15	1430	1300	1.9	641	0.21	0.06	0.08	1.4	0.21	--	0.06
DEC 10...	19	1310	1200	1.8	608	0.43	--	--	--	--	--	0.12
JAN 1985												
14...	16	1580	1500	2.1	303	0.54	--	--	--	--	--	0.09
FEB 19...	16	1540	1400	2.1	341	1.10	0.63	0.81	2.4	0.40	--	0.28
MAR 28...	13	421	410	0.57	4620	1.30	--	--	--	--	--	0.26
APR 29...	8.3	1160	1100	1.6	2240	0.46	--	--	--	--	--	0.07
MAY 21...	6.0	937	920	1.3	1040	<0.10	0.07	0.09	2.3	0.32	0.98	0.04
JUN 18...	4.4	1110	990	1.5	480	<0.10	--	--	--	--	--	0.05
JUL 15...	15	1250	1100	1.7	122	<0.10	--	--	--	--	--	0.11
AUG 13...	15	1360	1300	1.8	151	<0.10	0.09	0.12	2.1	0.17	0.52	0.08
SEP 09...	17	893	840	1.2	210	0.23	--	--	--	--	--	0.09

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 1984												
13...	0.05	<10	4	60	<0	<1	<1	<3	10	18	1	130
DEC 10...	--	--	--	--	--	--	--	--	9	<3	1	--
JAN 1985												
14...	--	--	--	--	--	--	--	--	15	30	9	--
FEB 19...	0.24	<10	2	57	0.5	2	<1	<3	29	33	<1	140
MAR 28...	--	--	--	--	--	--	--	--	8	76	4	--
APR 29...	--	--	--	--	--	--	--	--	14	11	<1	--
MAY 21...	0.01	<10	2	79	<0.5	1	<1	<3	15	7	6	82
JUN 18...	--	--	--	--	--	--	--	--	9	4	3	--
JUL 15...	--	--	--	--	--	--	--	--	11	15	<1	--
AUG 13...	0.06	<10	7	120	<0.5	<1	<1	<3	6	10	<1	130
SEP 09...	--	--	--	--	--	--	--	--	3	5	<1	--





## JAMES RIVER BASIN

06478500 JAMES RIVER NEAR SCOTLAND, SD--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	METHYL PARA- THION, DIS- SOLVED (UG/L)	METHYL- TRI- THION DISSOLV (UG/L)	METHYL TRI- THION, TOTAL (UG/L)	MIREX, DIS- SOLVED (UG/L)	MIREX, TOTAL (UG/L)	PARA- THION, DIS- SOLVED (UG/L)	PARA- THION, TOTAL (UG/L)	PER- THANE DISSOLV (UG/L)	PER- THANE TOTAL (UG/L)	PROME- TONE TOTAL (UG/L)	PROME- TRYNE TOTAL (UG/L)
AUG 29...	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.1	<0.1	<0.1	<0.1

DATE	PRO- PAZINE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	SIMA- ZINE TOTAL (UG/L)	SIME- TRYNE TOTAL (UG/L)	TOX- APHENE, DIS- SOLVED (UG/L)	TOX- APHENE, TOTAL (UG/L)	TRI- THION DISSOLV (UG/L)	TOTAL TRI- THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)
AUG 29...	<0.1	<0.01	<0.1	<0.1	<1.0	<1	<0.01	<0.01	0.1	<0.01	<0.01

## SPECIFIC CONDUCTANCE, IN MICROSIEMENS PER CENTIMETER AT 25°C, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1				1480	1460	1470	1660	1620	1640			
2				1560	1430	1500	1680	1650	1670			
3				1570	1510	1540	1690	1670	1680			
4				1570	1540	1560	1700	1670	1680			
5				1580	1540	1560	1710	1670	1680			
6				1570	1520	1550	1690	1670	1680			
7				1570	1500	1540	1680	1660	1670			
8				1550	1510	1530	1660	1640	1650			
9				1590	1540	1560	1650	1620	1630			
10				1590	1560	1580	1630	1600	1610			
11				1590	1570	1580	1610	1600	1600			
12				1610	1570	1590	1600	1570	1580			
13				1590	1580	1580	1670	1570	1610			
14	1490	1460	1480	1600	1580	1590	1690	1670	1680			
15	1490	1450	1470	1600	1560	1580	1680	1660	1670			
16	1480	1440	1460	1590	1560	1580	1680	1660	1670			
17	1450	1420	1440	1590	1580	1580						
18	1460	1420	1440	1610	1580	1590						
19	1440	1400	1420	1600	1570	1580						
20	1390	1360	1380	1590	1570	1580						
21	1370	1350	1360	1590	1550	1570						
22	1380	1350	1370	1570	1540	1560						
23	1410	1370	1390	1590	1540	1570						
24	1420	1390	1400	1590	1560	1570						
25	1440	1410	1420	1620	1570	1590						
26	1430	1400	1410	1630	1590	1610						
27	1440	1390	1420	1640	1610	1620						
28	1440	1430	1430	1630	1610	1620						
29	1460	1440	1450	1630	1610	1620						
30	1470	1440	1460	1630	1590	1610						
31				1620	1590	1600						

06478500 JAMES RIVER NEAR SCOTLAND, SD--Continued

PH, IN STANDARD UNITS, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1				8.1	7.5	7.6						
2				8.5	7.6	8.0						
3				8.3	7.9	8.1						
4				8.3	7.8	8.1						
5				8.3	8.0	8.1						
6				8.2	7.9	8.0						
7				8.3	7.7	8.0						
8				8.2	7.6	7.9						
9				8.2	7.7	8.0						
10				8.2	7.8	8.0						
11				8.1	7.7	7.9						
12				8.2	7.8	8.0						
13				8.0	7.7	7.8						
14	8.4	8.3	8.4	8.0	7.7	7.8	8.3	8.1	8.2			
15	8.5	8.3	8.4	8.0	7.7	7.8	8.3	7.8	8.1			
16	8.5	8.3	8.4	8.0	7.8	7.9	8.2	7.9	8.1			
17	8.6	8.4	8.5									
18	8.5	8.3	8.4									
19	8.6	8.4	8.5									
20	8.6	8.4	8.5									
21	8.5	8.2	8.3									
22	8.2	8.1	8.2									
23	8.3	8.2	8.2									
24	8.2	8.1	8.2									
25	8.3	8.1	8.2									
26	8.1	8.0	8.0									
27	8.1	8.0	8.0									
28	8.1	7.9	8.0									
29	8.1	7.8	8.0									
30	7.7	7.5	7.6									
31												

WATER TEMPERATURE, IN DEGREES CELSIUS, WATER YEAR OCTOBER 1984 TO 1985

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1				28.5	23.0	25.0	23.0	21.0	21.5			
2				29.0	24.0	26.0	23.0	22.0	22.5			
3				28.5	25.0	26.5	23.5	21.5	22.5			
4				27.0	25.5	26.0	28.0	23.0	25.0			
5				27.0	25.0	26.0	28.5	24.0	26.0			
6				27.5	25.0	26.5	28.0	25.0	26.5			
7				32.0	25.0	28.0	27.0	24.5	26.0			
8				28.0	26.0	27.0	27.5	26.0	26.5			
9				28.5	26.0	27.0	27.0	23.5	25.0			
10				28.5	26.0	27.5	26.0	22.0	23.5			
11				28.5	26.5	27.5	23.0	22.0	22.5			
12				31.0	26.5	28.5	24.0	22.5	23.0			
13				29.0	27.0	28.0	24.0	22.0	23.0			
14	22.0	21.5	21.5	28.0	25.5	26.5	23.5	22.0	22.5			
15	22.5	20.5	21.5	29.5	24.5	26.5	23.5	21.5	22.5			
16	23.5	21.5	22.5	26.5	25.0	25.5	23.5	21.5	22.5			
17	22.5	20.5	21.5	26.5	24.5	25.5						
18	20.5	19.5	20.0	29.5	25.5	27.5						
19	21.5	18.5	20.0	28.5	26.0	27.0						
20	23.5	19.5	21.5	27.0	25.5	26.0						
21	23.0	22.0	22.5	28.0	24.5	25.5						
22	23.5	21.0	22.0	26.5	23.5	24.5						
23	25.5	21.5	23.0	26.5	24.5	25.0						
24	25.0	22.0	23.5	26.0	25.5	25.5						
25	26.5	24.5	25.0	27.0	24.5	25.5						
26	24.5	21.0	22.5	28.0	24.5	26.0						
27	21.0	19.5	20.5	27.5	25.5	26.5						
28	22.5	20.0	21.0	27.5	26.0	26.5						
29	24.5	21.0	22.0	25.5	24.5	25.0						
30	26.0	22.0	23.5	24.5	22.5	23.0						
31				22.5	21.5	21.5						

06478500 JAMES RIVER NEAR SCOTLAND, SD--Continued

DISSOLVED OXYGEN, IN MILLIGRAMS PER LITER, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

[illegible]

## JAMES RIVER BASIN

205

06478513 JAMES RIVER NEAR YANKTON, SD

LOCATION.--Lat 42°59'45", long 97°22'10", in NE¼NW¼ sec.5, T.94 N., R.55 W., Yankton County, Hydrologic Unit 10160011, on left bank at downstream side of highway bridge, 3.9 mi upstream from Beaver Creek, 17.2 mi upstream from mouth, and 9 mi northeast of Yankton.

DRAINAGE AREA.--20,600 mi<sup>2</sup>, approximately, of which about 5,110 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1981 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,153.38 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, Dec. 1 to Mar. 8, which are poor. Low flow regulated by dams forming Arrowwood and Jim Lakes, combined capacity, 16,530 acre-ft, and by dam forming Jamestown Reservoir, capacity, 229,470 acre-ft, since May 1953, and by dam forming Pipestem Reservoir, capacity, 147,000 acre-ft, since 1973. Occasional backwater caused by Beaver Creek. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,400 ft<sup>3</sup>/s June 23, 1984 (gage height, 24.34 ft); minimum daily discharge, 0.78 ft<sup>3</sup>/s Oct. 4, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,820 ft<sup>3</sup>/s at 1215 hours, Mar. 31 (gage height, 13.25 ft); minimum daily discharge, 21 ft<sup>3</sup>/s Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	149	224	220	100	60	150	3760	978	538	113	45	277
2	153	215	220	100	60	150	3700	854	590	105	43	222
3	154	216	210	95	55	150	3580	707	576	98	43	161
4	153	202	200	90	55	150	3450	609	527	92	44	116
5	155	190	210	85	50	130	3300	531	448	86	38	94
6	163	197	220	85	50	100	3140	486	396	82	32	92
7	163	208	210	85	45	120	2980	462	369	80	27	86
8	167	209	210	85	45	200	2820	440	356	76	27	75
9	178	210	210	85	45	618	2620	406	347	72	31	73
10	182	215	210	85	40	911	2280	365	339	51	26	85
11	183	219	210	85	40	994	1770	359	326	46	21	89
12	178	226	220	85	40	1010	1350	336	298	47	54	85
13	172	222	210	85	40	1110	1120	304	275	44	48	94
14	173	213	200	85	40	1160	1000	331	255	44	50	98
15	197	208	200	85	40	1260	933	525	232	43	47	103
16	220	217	190	85	40	1490	850	659	214	33	50	118
17	254	230	190	85	45	1760	800	606	197	38	65	136
18	265	228	190	85	60	1980	750	529	179	41	65	149
19	307	224	180	85	80	2120	700	498	170	34	70	161
20	306	228	190	85	100	2220	650	531	162	30	67	164
21	319	230	180	85	200	2310	650	493	152	33	64	164
22	316	225	170	85	300	2410	600	449	137	35	64	165
23	304	214	160	85	350	2520	700	407	128	35	76	166
24	291	224	160	85	300	2610	900	365	118	37	62	163
25	281	225	150	80	250	2720	1100	332	113	35	56	165
26	269	224	140	75	200	2980	1300	297	137	37	56	167
27	260	221	140	75	200	3310	1200	274	139	63	58	165
28	252	228	130	70	150	3590	1100	258	131	78	66	164
29	249	244	120	70	---	3740	1000	304	130	68	64	168
30	241	246	120	70	---	3770	980	346	122	56	63	169
31	232	---	110	65	---	3800	---	434	---	48	201	---
TOTAL	6886	6582	5680	2590	2980	51543	51083	14475	8101	1780	1723	4134
MEAN	222	219	183	83.5	106	1663	1703	467	270	57.4	55.6	138
MAX	319	246	220	100	350	3800	3760	978	590	113	201	277
MIN	149	190	110	65	40	100	600	258	113	30	21	73
AC-FT	1366	13060	11270	5140	5910	102200	101300	28710	16070	3530	3420	8200
CAL YR 1984	TOTAL	683330		MEAN	1867	MAX	26000	MIN	80	AC-FT	1355000	
WTR YR 1985	TOTAL	157557		MEAN	432	MAX	3800	MIN	21	AC-FT	312500	

## MISSOURI RIVER MAIN STEM

06478515 MISSOURI RIVER NEAR GAYVILLE, SD

## STAGE RECORDS

LOCATION.--Lat 42°51'01", long 97°13'12", in SW¼NW¼ sec.27, T.93 N., R.54 W., Yankton County, Hydrologic Unit 10170101, 3.8 mi southwest of Gayville, 4.1 mi downstream from James River and at mile 796.0.

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,100.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Stage regulated by Gavins Point Dam 15.0 mi upstream. Gage heights for period of October 1969 to September 1980 in files of U.S. Army Corps of Engineers.

GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50.43	50.72	50.44	47.73	50.36	47.21	48.07	47.30	48.54	48.82	48.88	48.84
2	50.38	50.75	50.11	47.77	50.36	47.23	48.07	47.49	48.55	48.80	48.91	48.88
3	50.23	50.75	49.71	47.55	50.25	47.24	48.17	47.61	48.50	48.81	48.91	48.85
4	50.29	50.69	49.28	47.28	50.14	47.22	48.08	47.71	48.28	48.78	48.89	48.87
5	50.27	50.67	49.07	47.22	50.06	47.33	48.04	47.80	48.21	48.79	48.88	48.86
6	50.29	50.66	48.96	47.13	50.00	47.24	48.01	47.98	48.46	48.80	48.88	48.75
7	50.25	50.66	48.53	47.05	49.86	47.20	48.03	48.10	48.59	48.80	48.89	48.70
8	50.23	50.65	48.17	47.08	49.77	47.21	48.02	48.18	48.57	48.77	48.93	48.65
9	50.29	50.64	48.03	47.06	49.63	47.21	48.05	48.35	48.55	48.74	48.87	48.56
10	50.28	50.60	47.98	47.11	49.43	47.24	48.15	48.36	48.56	48.79	48.84	48.57
11	50.28	50.63	47.98	47.26	49.35	47.26	48.22	48.42	48.56	48.77	48.89	48.61
12	50.25	50.63	47.91	47.66	49.34	47.22	48.15	48.43	48.53	48.77	48.97	48.66
13	50.22	50.62	47.97	47.36	49.24	47.20	48.11	48.40	48.58	48.77	48.91	48.65
14	50.21	50.62	47.94	47.36	49.20	47.25	48.18	48.24	48.63	48.76	48.88	48.55
15	50.31	50.59	47.86	47.47	49.09	47.29	48.24	48.03	48.68	48.81	48.87	48.60
16	50.40	50.62	47.85	47.44	48.69	47.32	48.32	47.83	48.66	48.91	48.94	48.59
17	50.57	50.63	47.82	47.27	47.99	47.36	48.37	47.87	48.52	48.99	48.97	48.46
18	50.63	50.60	47.89	47.18	47.43	47.41	48.40	48.12	48.55	49.01	48.78	48.54
19	50.73	50.62	47.87	47.08	47.23	47.46	48.43	48.14	48.55	49.03	48.78	48.64
20	50.75	50.65	47.64	48.15	47.22	47.42	48.48	48.17	48.65	48.79	48.81	48.59
21	50.72	50.65	47.45	51.19	47.21	47.47	48.55	48.24	48.67	48.78	48.86	48.60
22	50.72	50.63	47.44	51.68	47.22	47.46	48.40	48.27	48.67	48.87	48.87	48.61
23	50.82	50.62	47.29	51.50	47.22	47.46	47.80	48.34	48.67	48.92	48.85	48.63
24	50.89	50.64	47.17	50.98	47.23	47.47	46.46	48.51	48.71	48.90	48.77	48.64
25	50.89	50.66	47.42	50.51	47.23	47.51	45.77	48.54	48.77	48.84	48.79	48.58
26	50.88	50.63	47.31	50.81	47.20	47.60	45.66	48.51	48.76	48.86	48.82	48.57
27	50.85	50.61	47.32	50.72	47.21	47.56	45.60	48.52	48.72	48.89	48.83	48.56
28	50.81	50.63	47.20	50.40	47.21	47.64	45.54	48.53	48.73	48.88	48.84	48.60
29	50.83	50.63	47.33	50.01	---	47.71	45.80	48.52	48.74	48.87	48.79	48.62
30	50.77	50.62	47.70	49.88	---	47.83	47.10	48.54	48.78	48.88	48.60	48.62
31	50.78	---	47.47	50.17	---	47.96	---	48.51	---	48.87	48.69	---
MEAN	50.52	50.64	48.07	48.55	48.66	47.39	47.68	48.18	48.60	48.84	48.85	48.65
MAX	50.89	50.75	50.44	51.68	50.36	47.96	48.55	48.54	48.78	49.03	48.97	48.88
MIN	50.21	50.59	47.17	47.05	47.20	47.20	45.54	47.30	48.21	48.74	48.60	48.46



## VERMILLION RIVER BASIN

207

06478540 LITTLE VERMILLION RIVER NEAR SALEM, SD  
(Hydrologic bench-mark station)

LOCATION.--Lat 43°47'39", long 97°22'02", in SW¼ sec.19, T.104 N., R.54 W., McCook County, Hydrologic Unit 10170102, on right wingwall at downstream end of culvert on county highway, 2.0 mi upstream from small left-bank tributary, and 5.2 mi northeast of Salem.

DRAINAGE AREA.--77.7 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1966 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder and concrete dam. Elevation of gage is 1,510 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Feb. 20 to Mar. 14, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--19 years, 4.24 ft<sup>3</sup>/s (3,070 acre-ft/yr); median of yearly mean discharges, 1.9 ft<sup>3</sup>/s (1,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 900 ft<sup>3</sup>/s June 20, 1984 (gage height, 9.88 ft) (backwater from tributary); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 24	0900	15	a4.92	Apr. 4	1500	13	4.60
Mar. 15	2100	*406	*7.18	Apr. 24	1300	13	4.63

a Backwater from ice.

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.02	.00	.00	.00	5.0	7.8	2.8	3.0	.00	.00	.00
2	.00	.01	.00	.00	.00	3.0	7.0	1.8	3.0	.00	.00	.00
3	.00	.02	.00	.00	.00	3.0	5.6	1.3	1.8	.00	.00	.00
4	.00	.04	.00	.00	.00	2.0	11	.82	1.5	.00	.00	.00
5	.00	.03	.00	.00	.00	1.8	12	.55	1.0	.00	.00	.00
6	.00	.02	.00	.00	.00	1.7	11	.36	.63	.00	.00	.00
7	.00	.02	.00	.00	.00	1.7	8.4	.18	.36	.00	.00	.00
8	.00	.01	.00	.00	.00	1.8	6.3	.09	.20	.00	.00	.00
9	.00	.00	.00	.00	.00	2.0	5.0	.02	.02	.00	.00	.00
10	.00	.00	.00	.00	.00	3.0	4.1	.01	.01	.00	.00	.00
11	.00	.00	.00	.00	.00	4.0	3.7	.01	.09	.00	.00	.00
12	.00	.00	.00	.00	.00	5.0	3.5	.00	.02	.00	.00	.00
13	.00	.00	.00	.00	.00	120	3.0	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	250	2.8	.04	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	328	2.3	1.1	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	376	2.1	1.8	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	318	2.0	1.5	.00	.00	.00	.00
18	.01	.00	.00	.00	.00	207	1.7	.99	.00	.00	.00	.00
19	3.0	.00	.00	.00	.00	129	1.3	.59	.00	.00	.00	.00
20	1.1	.00	.00	.00	.50	81	1.6	.29	.00	.00	.00	.00
21	1.1	.00	.00	.00	1.0	58	1.5	.18	.00	.00	.00	.00
22	.72	.00	.00	.00	3.0	45	2.1	.04	.00	.00	.00	.00
23	.72	.00	.00	.00	5.0	36	9.9	.06	.00	.00	.00	.00
24	.67	.00	.00	.00	13	30	13	.02	.00	.00	.00	.00
25	.67	.00	.00	.00	5.0	26	12	.00	.00	.00	.00	.00
26	.63	.00	.00	.00	2.0	21	11	.00	.00	.00	.00	.00
27	.59	.00	.00	.00	3.0	17	8.9	.00	.00	.00	.00	.00
28	.36	.00	.00	.00	7.0	14	6.7	.00	.00	.00	.00	.00
29	.29	.00	.00	.00	---	11	4.5	.23	.00	.00	.00	.00
30	.20	.00	.00	.00	---	9.3	3.6	.55	.00	.00	.00	.00
31	.09	---	.00	.00	---	8.4	---	1.6	---	.00	.00	---
TOTAL	10.15	.17	.00	.00	39.50	2118.7	175.4	16.93	11.63	.00	.00	.00
MEAN	.33	.01	.00	.00	1.41	68.3	5.85	.55	.39	.00	.00	.00
MAX	3.0	.04	.00	.00	13	376	13	2.8	3.0	.00	.00	.00
MIN	.00	.00	.00	.00	.00	1.7	1.3	.00	.00	.00	.00	.00
AC-FT	2	.3	.00	.00	78	4200	348	34	23	.00	.00	.00

CAL YR 1984	TOTAL	9068.95	MEAN	24.8	MAX	800	MIN	.00	AC-FT	17990
WTR YR 1985	TOTAL	2372.48	MEAN	6.50	MAX	376	MIN	.00	AC-FT	4710

## 06478690 WEST FORK VERMILLION RIVER NEAR PARKER, SD

LOCATION.--Lat 43°24'55", long 97°12'18", in NE¼NE¼ sec.10, T.99 N., R.54 W., Turner County, Hydrologic Unit 10170102, on left downstream wingwall of bridge, 3.7 mi northwest of Parker, and 13.9 mi upstream from confluence with East Fork Vermillion River.

DRAINAGE AREA.--370 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--August 1961 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,340 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Oct. 11, 1973, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good except those for winter period and/or backwater from beaver dam, Oct. 1 to Mar. 14, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--24 years, 32.4 ft<sup>3</sup>/s (23,470 acre-ft/yr); median of yearly mean discharges, 9.0 ft<sup>3</sup>/s (6,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,800 ft<sup>3</sup>/s June 16, 1984 (gage height, 12.57 ft); no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	1545	*1,690	*9.79	Apr. 24	0100	391	5.62

Minimum daily discharge, 0.43 ft<sup>3</sup>/s Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.5	3.5	1.0	.85	13	57	35	21	3.0	.66	.76
2	2.0	1.5	3.5	1.0	.85	12	57	29	15	2.7	.66	.66
3	2.2	2.0	3.0	1.5	.85	7.9	62	25	12	2.6	.58	.66
4	2.2	2.0	2.7	2.0	.85	5.9	77	22	11	2.4	.52	.85
5	2.0	2.0	2.7	2.5	.85	6.0	93	21	11	2.0	.52	8.5
6	2.2	2.5	2.7	2.5	.85	5.1	74	19	9.2	1.8	.52	5.0
7	2.5	2.5	2.7	2.0	.85	5.7	66	17	8.1	1.7	.52	2.3
8	2.6	2.5	2.7	2.0	.85	9.2	62	16	6.9	1.5	.56	1.5
9	2.7	3.0	2.7	1.5	.87	31	58	14	6.1	1.3	.55	1.1
10	2.7	3.0	2.7	1.5	.90	100	40	14	5.7	1.2	.56	.96
11	2.8	3.0	3.5	1.5	.95	300	36	14	6.2	1.2	.43	.87
12	2.7	3.0	3.5	1.5	1.0	400	33	13	6.0	1.1	1.0	1.1
13	2.5	3.0	3.5	1.5	1.5	570	31	12	5.5	1.1	.91	3.3
14	3.1	3.5	3.5	1.5	2.0	950	30	14	5.6	1.1	.77	4.2
15	5.7	3.5	4.5	1.5	2.0	1050	29	15	5.3	1.0	.66	3.0
16	5.9	3.5	5.5	1.5	2.0	1480	27	16	7.1	.91	.72	2.3
17	5.2	3.5	5.5	1.5	5.0	1050	25	15	7.2	.75	1.5	2.0
18	6.1	3.5	5.0	1.5	10	707	24	13	6.4	.75	.96	1.9
19	11	3.5	5.0	1.5	10	544	23	13	6.2	.78	.82	1.7
20	7.4	3.5	5.0	1.4	15	370	23	11	5.8	.84	.66	1.3
21	5.4	3.5	5.0	1.3	30	256	28	9.7	5.5	.70	.72	1.9
22	4.4	4.0	5.0	1.2	25	187	34	8.9	4.9	.69	.73	2.2
23	3.0	4.0	4.0	1.1	20	140	256	8.5	4.5	.73	2.6	2.2
24	1.9	4.0	3.0	1.1	20	114	301	8.5	3.9	1.5	2.2	2.3
25	1.7	4.0	3.0	1.0	15	96	161	8.1	3.2	1.1	1.2	2.2
26	1.5	4.0	3.0	.97	15	84	99	7.3	4.2	.86	.87	1.9
27	1.5	4.0	3.0	.95	15	81	76	6.9	4.5	.75	.67	1.9
28	1.5	3.5	3.0	.90	14	73	59	6.7	3.9	.75	1.4	1.6
29	1.5	3.5	3.0	.88	---	63	48	37	3.5	.75	1.8	1.5
30	1.5	3.5	2.5	.86	---	59	41	74	3.3	.66	1.2	1.4
31	1.5	---	2.0	.84	---	57	---	28	---	.66	.86	---
TOTAL	100.9	94.0	109.9	43.50	212.02	8826.8	2030	551.6	208.7	38.88	28.33	63.06
MEAN	3.25	3.13	3.55	1.40	7.57	285	67.7	17.8	6.96	1.25	.91	2.10
MAX	11	4.0	5.5	2.5	30	1480	301	74	21	3.0	2.6	8.5
MIN	1.5	1.5	2.0	.84	.85	5.1	23	6.7	3.2	.66	.43	.66
AC-FT	20	186	218	86	421	17510	4030	1090	414	77	56	125
CAL YR 1984	TOTAL	73432.2		MEAN	201	MAX	3910	MIN	1.1	AC-FT	145700	
WTR YR 1985	TOTAL	12307.69		MEAN	33.7	MAX	1480	MIN	.43	AC-FT	24410	

## VERMILLION RIVER BASIN

209

06479010 VERMILLION RIVER NEAR VERMILLION, SD

LOCATION.--Lat 42°49'02", long 96°55'26", in SE¼SE¼NW¼ sec.1, T.92 N., R.52 W., Clay County, Hydrologic Unit 10170102, on left bank 30 ft downstream from bridge, 2.7 mi north of Vermillion, 2.9 mi upstream from Clay Creek, and 10.8 mi upstream from mouth.

DRAINAGE AREA.--1,779 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,125 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Dec. 1 to Feb. 19, which are poor. Several observations of water temperature and specific conductance were made during the year. U.S. Army Corps of Engineers satellite data-collection platform at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,400 ft<sup>3</sup>/s June 23, 1984 (gage height, 31.77 ft); minimum daily discharge, 40 ft<sup>3</sup>/s Feb. 11-17, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 22	1500	2,050	*15.68	June 27	1115	1,230	12.57
Apr. 27	1315	*2,120	*15.68				

Minimum daily discharge, 40 ft<sup>3</sup>/s Feb. 11-17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	194	110	60	50	139	472	1640	586	265	52	166
2	82	177	100	60	50	151	456	1450	491	217	49	147
3	82	170	90	60	50	156	424	1330	368	189	48	119
4	80	164	90	65	50	170	412	1010	305	170	47	94
5	78	163	90	75	45	180	426	732	270	147	46	83
6	81	156	90	75	45	190	469	599	244	133	44	79
7	88	152	90	70	45	203	599	514	226	124	44	100
8	109	151	90	70	45	235	619	476	210	115	44	120
9	114	148	95	70	45	384	550	410	190	107	44	102
10	116	146	100	70	45	573	487	357	175	100	50	85
11	109	145	105	65	40	921	435	337	172	95	80	75
12	103	143	110	65	40	1210	398	368	173	91	100	69
13	102	138	115	65	40	1340	365	370	170	88	90	80
14	101	136	120	65	40	1440	339	400	160	84	80	183
15	106	134	115	65	40	1470	325	700	150	80	64	301
16	121	129	110	65	40	1490	309	600	140	78	60	329
17	134	128	110	65	40	1580	289	500	130	75	65	271
18	178	126	105	65	45	1670	271	400	120	73	61	215
19	286	127	100	65	45	1750	254	450	114	71	58	177
20	525	123	100	65	46	1860	240	600	108	69	53	146
21	597	119	95	60	48	1940	234	500	112	67	55	129
22	561	116	90	60	49	1990	292	400	104	66	53	119
23	447	121	80	60	66	1950	1260	295	95	64	58	115
24	366	125	80	60	129	1730	1770	246	91	64	84	119
25	325	125	80	60	163	1250	2010	244	90	62	88	122
26	298	123	85	60	158	992	2100	235	523	60	75	122
27	282	122	90	60	132	807	2120	224	1120	56	73	115
28	256	120	80	55	129	677	2090	210	730	58	67	105
29	236	120	75	55	---	607	2000	216	531	54	68	101
30	220	117	70	55	---	543	1840	429	366	53	132	102
31	205	---	65	55	---	503	---	472	---	53	234	---
TOTAL	6470	4158	2925	1965	1760	30101	23855	16714	8264	3028	2166	4090
MEAN	209	139	94.4	63.4	62.9	971	795	539	275	97.7	69.9	136
MAX	597	194	120	75	163	1990	2120	1640	1120	265	234	329
MIN	78	116	65	55	40	139	234	210	90	53	44	69
AC-FT	1283	8250	5800	3900	3490	59710	47320	33150	16390	6010	4300	8110
CAL YR 1984	TOTAL	449498		MEAN	1228	MAX	20200	MIN	50	AC-FT	891600	
WTR YR 1985	TOTAL	105496		MEAN	289	MAX	2120	MIN	40	AC-FT	209300	

## BIG SIOUX RIVER BASIN

06479215 BIG SIOUX RIVER NEAR FLORENCE, SD

LOCATION.--Lat 45°10'51", long 97°11'09", in NE¼NE¼NE¼ sec.17, T.120 N., R.52 W., Grant County, Hydrologic Unit 10170202, on right bank near downstream side of county highway bridge 11.0 mi northeast of Florence and 2.2 mi upstream from Indian Creek.

DRAINAGE AREA.--638 mi<sup>2</sup>, of which 570 mi<sup>2</sup> is partly or entirely noncontributing.

PERIOD OF RECORD.--June 6, 1984, to Sept. 30, 1984.

GAGE.--Water-stage recorder. Elevation of gage is 1,580 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records fair. Several observations of water temperature and specific conductance were collected during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft<sup>3</sup>/s and maximum (\*) during period June to September 1984:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 8	0500	47	5.97	June 15	2115	*194	*8.05
June 10	1745	47	5.97	June 17	0630	115	7.40

Minimum daily discharge, 0.02 ft<sup>3</sup>/s Sept. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1									---	10	.29	.21
2									---	9.2	.27	.17
3									---	8.2	.51	.16
4									---	7.0	1.9	.13
5									---	6.0	1.9	.10
6									5.0	6.0	1.0	.09
7									7.7	6.0	1.2	.09
8									35	5.0	1.2	.09
9									31	5.0	1.5	.09
10									43	5.0	2.9	.09
11									37	5.0	3.2	.09
12									31	5.0	2.4	.08
13									24	4.0	1.7	.08
14									22	5.0	1.2	.07
15									106	4.0	.83	.07
16									112	3.0	.60	.07
17									106	3.0	.54	.07
18									78	2.0	.79	.05
19									56	2.0	.71	.05
20									43	1.4	.65	.04
21									35	1.3	1.2	.03
22									33	.76	1.4	.02
23									35	1.1	1.5	.05
24									30	.94	1.3	.10
25									26	.79	1.3	.09
26									21	.77	1.2	.09
27									18	.77	1.0	.09
28									16	.71	.85	.09
29									14	.52	.67	.10
30									12	.40	.44	.10
31									---	.33	.30	---
TOTAL									---	110.19	36.45	2.65
MEAN									---	3.55	1.18	.09
MAX									---	10	3.2	.21
MIN									---	.33	.27	.02
AC-FT									---	219	72	5.3

## BIG SIOUX RIVER BASIN

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06479215 BIG SIOUX RIVER NEAR FLORENCE, SD

LOCATION.--Lat 45°10'51", long 97°11'09", in NE¼NE¼NE¼ sec.17, T.120 N., R.52 W., Grant County, Hydrologic Unit 10170202, on right bank near downstream side of county highway bridge 11.0 mi northeast of Florence and 2.2 mi upstream from Indian Creek.

DRAINAGE AREA.--638 mi<sup>2</sup>, of which 570 mi<sup>2</sup> is partly or entirely noncontributing.

PERIOD OF RECORD.--June 6, 1984, to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,580 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for periods of no gage-height record, Oct. 16 to Nov. 8 and Nov. 11 to Dec. 5, and period of backwater from ice, Feb. 20 to Mar. 19, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 268 ft<sup>3</sup>/s Mar. 20, 1985 (gage height, 7.72 ft); maximum gage height, 8.33 ft (backwater from ice); no flow Aug. 9-11, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 40 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	0100	ice jam	a*8.33	May 12	0745	55	5.69
Mar. 20	0245	*268	7.72				

a Backwater from ice.  
No flow Aug. 9-11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	6.0	5.0	.18	.04	20	12	9.9	1.1	.10	.04	4.9
2	.11	6.0	4.5	.17	.04	15	11	8.6	.81	.09	.03	5.5
3	.11	6.0	4.2	.15	.04	10	9.7	7.5	.85	.08	.02	7.7
4	.12	6.0	3.9	.15	.04	10	8.7	6.4	.89	.06	.02	13
5	.13	5.0	3.5	.15	.04	15	7.9	6.0	1.1	.04	.01	26
6	.13	5.0	1.9	.15	.04	15	7.5	5.1	1.2	.03	.01	29
7	.17	5.0	3.9	.15	.03	15	7.3	4.3	1.1	.01	.01	22
8	.18	5.0	3.8	.15	.04	15	6.8	3.6	.84	.01	.01	16
9	.17	5.0	2.4	.15	.04	15	6.2	3.4	.62	.01	.00	16
10	.18	3.1	2.0	.15	.04	15	6.1	3.4	.53	.01	.00	15
11	.19	3.0	2.0	.14	.04	25	5.7	5.6	1.5	.01	.00	15
12	.19	3.0	2.0	.12	.04	30	5.2	33	1.7	.01	.06	14
13	.18	3.0	2.0	.12	.04	40	4.7	12	1.3	.01	.09	14
14	.29	4.0	1.9	.12	.04	50	4.5	9.0	1.0	.03	.09	14
15	1.5	5.0	1.7	.11	.03	120	5.0	9.3	.84	.04	.09	13
16	10	5.0	1.7	.11	.03	200	6.0	11	.82	.04	.08	13
17	5.0	5.0	1.7	.11	.03	170	6.6	9.9	.89	.06	.08	11
18	15	4.0	1.6	.11	.03	150	7.2	8.7	.88	.24	.08	11
19	15	4.0	1.5	.10	.04	190	7.2	8.0	.89	.13	.08	11
20	13	4.0	1.2	.09	2.0	217	7.2	7.3	.65	.08	.08	8.8
21	12	4.0	1.1	.08	1.0	143	7.5	6.4	.43	.06	.09	7.8
22	11	4.0	.83	.08	5.0	98	9.2	5.5	.28	.05	.08	7.3
23	10	4.0	.61	.05	10	83	19	4.3	.19	.03	5.0	6.8
24	9.0	5.0	.50	.06	10	64	28	3.5	.13	.09	1.2	6.3
25	9.0	6.0	.38	.07	15	44	32	2.4	.11	.11	2.8	5.4
26	8.0	5.5	.32	.07	20	28	26	2.1	.11	.08	1.3	3.7
27	8.0	5.0	.30	.07	25	21	19	1.9	.12	.05	1.3	5.0
28	7.0	5.0	.30	.07	20	21	15	1.5	.13	.04	2.0	5.1
29	7.0	5.0	.27	.06	---	21	13	1.2	.12	.03	2.2	4.6
30	7.0	5.0	.20	.06	---	17	12	.91	.12	.02	2.4	4.1
31	6.0	---	.18	.06	---	15	---	1.0	---	.04	2.9	---
TOTAL	155.76	140.6	57.39	3.41	108.71	1892	323.2	202.71	21.25	1.69	22.15	336.0
MEAN	5.02	4.69	1.85	.11	3.88	61.0	10.8	6.54	.71	.05	.71	11.2
MAX	15	6.0	5.0	.18	25	217	32	33	1.7	.24	5.0	29
MIN	.11	3.0	.18	.05	.03	10	4.5	.91	.11	.01	.00	3.7
AC-FT	30	279	114	6.8	216	3750	641	402	42	3.4	44	666
WTR YR 1985	TOTAL	3264.87		MEAN	8.94	MAX	217	MIN	.00	AC-FT	6480	



## BIG SIOUX RIVER BASIN

06479438 BIG SIOUX RIVER NEAR WATERTOWN, SD

LOCATION.--Lat 45°00'22", long 97°09'53", in NE¼NE¼NE¼ sec.16, T.118 N., R.52 W., Codington County, Hydrologic Unit 10170202, on left bank at downstream side of county highway bridge, 4.9 mi downstream from Mahoney Creek, 6.5 mi upstream from inlet-outlet to Lake Kampeska, and 7.5 mi northwest of Watertown.

DRAINAGE AREA.--1,007 mi<sup>2</sup>, approximately, of which about 779 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1972 to current year.

REVISED RECORDS.--WDR SD-78-1: 1973-74(M), 1976-77(M). WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,725.81 ft above National Geodetic Vertical Datum of 1929 (South Dakota Department of Transportation bench mark).

REMARKS.--Records good except those for winter period, Nov. 28 to Mar. 18, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--13 years, 21.3 ft<sup>3</sup>/s (15,430 acre-ft/yr); median of yearly mean discharge, 11 ft<sup>3</sup>/s (8,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,720 ft<sup>3</sup>/s Mar. 30, 1978 (gage height, 11.07 ft); no flow at times in 1974-82, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	unknown	*1,700	a*9.62	July 18	unknown	800	8.40

a Backwater from ice.

Minimum daily discharge, 0.10 ft<sup>3</sup>/s Feb. 6-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	25	11	3.6	.60	50	55	37	7.3	2.1	6.4	18
2	1.9	22	9.8	3.5	.50	40	49	34	7.6	1.8	5.5	19
3	1.8	21	9.5	3.3	.40	50	45	32	7.6	1.8	5.0	20
4	1.9	20	9.3	3.2	.30	60	42	29	8.3	1.6	3.5	32
5	1.6	19	8.8	3.1	.20	55	41	27	8.7	1.2	2.4	39
6	1.7	19	8.4	2.9	.10	50	39	25	6.1	1.1	2.6	43
7	3.4	18	8.0	2.8	.10	50	37	23	4.3	.87	2.8	44
8	3.5	18	7.6	2.7	.10	50	34	21	5.2	1.4	2.7	50
9	4.8	18	7.6	2.6	.10	50	33	19	4.5	1.1	1.9	112
10	4.4	15	7.4	2.6	.10	50	32	18	4.1	1.2	1.7	95
11	5.4	18	7.4	2.5	.10	50	31	17	7.6	1.2	1.7	69
12	5.9	16	7.2	2.5	.10	50	30	73	7.5	1.2	3.6	51
13	4.3	17	6.8	2.5	.10	50	30	143	7.5	1.0	2.2	45
14	5.6	16	6.4	2.4	.10	80	29	90	9.1	1.0	2.7	42
15	12	18	6.2	2.3	.10	150	29	57	9.0	1.4	2.2	39
16	17	15	6.2	2.3	.20	400	29	47	8.3	1.2	1.8	35
17	19	14	6.0	2.3	.20	1500	25	42	6.4	1.0	1.8	32
18	20	12	5.6	2.1	.30	1300	25	38	6.7	500	1.4	29
19	26	12	5.2	2.0	.50	1180	25	34	5.2	150	1.2	26
20	40	12	5.0	1.8	1.0	899	25	29	5.0	50	1.2	23
21	48	12	4.8	1.8	2.0	564	26	25	4.5	30	1.0	22
22	50	12	4.8	1.6	2.0	525	28	23	4.5	23	.95	21
23	49	12	4.7	1.4	2.0	347	41	20	3.6	16	2.1	19
24	44	12	4.7	1.4	8.0	256	81	18	3.6	10	3.4	18
25	41	12	4.4	1.4	30	181	100	16	2.7	10	4.2	17
26	36	13	4.3	1.6	50	133	85	15	2.5	7.0	5.0	16
27	32	16	4.1	1.4	90	115	70	13	2.8	6.4	7.6	14
28	29	15	4.0	1.2	100	107	57	12	2.4	5.0	15	14
29	26	13	3.9	.90	---	85	48	12	2.4	4.2	15	13
30	24	12	3.8	.80	---	71	41	11	2.4	3.8	17	13
31	23	---	3.7	.70	---	62	---	8.6	---	7.0	16	---
TOTAL	584.4	474	196.6	67.20	289.20	8610	1262	1008.6	167.4	844.57	141.55	1030
MEAN	18.9	15.8	6.34	2.17	10.3	278	42.1	32.5	5.58	27.2	4.57	34.3
MAX	50	25	11	3.6	100	1500	100	143	9.1	500	17	112
MIN	1.6	12	3.7	.70	.10	40	25	8.6	2.4	.87	.95	13
AC-FT	116	940	390	133	574	17080	2500	2000	332	1680	281	2040
CAL YR 1984	TOTAL	17489.93		MEAN	47.8	MAX	1180	MIN	.05	AC-FT	34690	
WTR YR 1985	TOTAL	14675.52		MEAN	40.2	MAX	1500	MIN	.10	AC-FT	29110	

## 06479515 WILLOW CREEK NEAR WATERTOWN, SD

LOCATION.--Lat 44°54'17", long 97°03'31", in NE¼NW¼ sec.34, T.117 N., R.52 W., Codington County, Hydrologic Unit 10170202, on right bank 5 ft downstream from bridge, 4.7 mi upstream from mouth, and 2.8 mi east of Watertown.

DRAINAGE AREA.--110 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--September 1971 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,721.24 ft above National Geodetic Vertical Datum of 1929 (South Dakota Department of Transportation bench mark).

REMARKS.--Records good except those for winter period, Jan. 9 to Mar. 20, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--14 years, 15.2 ft<sup>3</sup>/s (11,010 acre-ft/yr); median of yearly mean discharges, 6.5 ft<sup>3</sup>/s (4,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,040 ft<sup>3</sup>/s June 15, 1984 (gage height, 7.50 ft); maximum gage height, 9.86 ft Mar. 15, 1972 (backwater from ice); no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	unknown	--	a*7.71	July 18	1230	425	5.07
Mar. 19	0045	*1,600	a6.76	Sept. 9	1200	224	4.66

a Backwater from ice.

Minimum daily discharge, 0.26 ft<sup>3</sup>/s Feb. 8-10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	17	6.7	2.8	.28	30	75	20	7.7	1.9	2.4	5.2
2	.99	12	6.1	2.5	.28	20	74	16	8.4	1.8	1.6	27
3	.84	11	6.8	2.5	.28	10	74	12	9.0	1.6	1.4	139
4	.78	12	6.8	2.5	.28	9.0	74	9.5	9.0	1.3	1.4	75
5	.95	12	6.5	2.5	.27	8.5	66	6.4	8.1	1.3	1.2	49
6	1.3	11	6.5	2.5	.27	9.0	64	7.8	7.4	1.0	1.2	40
7	2.5	11	6.5	2.5	.27	10	59	7.9	6.8	.91	1.6	30
8	3.7	12	6.5	2.5	.26	20	62	8.6	5.8	.89	1.3	37
9	5.2	12	6.5	2.0	.26	50	67	10	4.3	.85	1.2	176
10	4.7	17	6.5	2.0	.26	100	65	7.9	4.8	.76	1.1	94
11	3.9	9.7	6.5	1.5	.28	150	56	7.4	9.3	.70	1.1	56
12	3.6	8.5	6.0	1.5	.30	200	43	11	6.6	.60	1.8	42
13	3.7	8.4	6.0	1.5	.33	200	39	16	4.2	.41	2.1	38
14	4.4	9.7	6.0	1.0	.37	200	37	17	3.8	.37	3.0	36
15	12	14	6.0	1.0	.43	300	39	19	3.7	.41	2.2	33
16	25	15	6.0	.90	.50	900	37	19	2.9	.31	2.3	30
17	27	8.4	6.0	.80	1.0	700	38	20	2.3	1.4	18	29
18	24	6.9	5.5	.80	5.0	800	39	15	2.1	182	14	24
19	70	6.7	5.0	.70	10	700	32	11	2.3	84	5.0	21
20	75	6.1	4.5	.70	50	500	26	8.9	2.1	34	3.8	20
21	42	5.2	5.0	.60	100	262	22	8.3	2.1	15	3.4	18
22	31	6.7	5.0	.50	70	291	26	7.1	2.7	8.6	3.3	19
23	25	6.1	5.0	.50	50	155	56	7.1	2.3	5.3	3.9	22
24	20	6.3	5.0	.40	50	111	68	6.2	1.9	4.1	3.3	19
25	18	6.9	4.0	.35	60	73	47	6.0	1.4	3.8	4.2	19
26	15	8.7	3.5	.33	50	109	33	6.0	1.8	3.4	3.3	17
27	15	7.5	3.5	.30	40	112	32	7.0	2.1	2.8	2.8	17
28	13	7.0	3.5	.30	40	88	27	6.1	2.3	2.6	3.6	17
29	11	7.0	3.0	.29	---	88	22	8.6	2.5	2.1	4.2	15
30	12	6.8	3.0	.29	---	83	20	9.4	2.5	2.2	11	15
31	11	---	3.0	.28	---	78	---	9.7	---	2.5	7.6	---
TOTAL	483.76	288.6	166.4	38.84	530.92	6366.5	1419	331.9	132.2	368.91	118.3	1179.2
MEAN	15.6	9.62	5.37	1.25	19.0	205	47.3	10.7	4.41	11.9	3.82	39.3
MAX	75	17	6.8	2.8	100	900	75	20	9.3	182	18	176
MIN	.78	5.2	3.0	.28	.26	8.5	20	6.0	1.4	.31	1.1	5.2
AC-FT	96	572	330	77	1050	12630	2810	658	262	732	235	2340
CAL YR 1984	TOTAL	16434.58		MEAN	44.9	MAX	1300	MIN	.00	AC-FT	32600	
WTR YR 1985	TOTAL	11424.53		MEAN	31.3	MAX	900	MIN	.26	AC-FT	22660	

## BIG SIOUX RIVER BASIN

06479525 BIG SIOUX RIVER NEAR CASTLEWOOD, SD

LOCATION.--Lat 44°43'54", long 97°02'39", in SW¼SW¼ sec.26, T.115 N., R.52 W., Hamlin County, Hydrologic Unit 10170202, on right bank at upstream side of highway bridge on State Highway 22, 3.25 mi east of intersection of U.S. Highway 81 and State Highway 22, and 1.0 mi northwest of Castlewood.

DRAINAGE AREA.--1,997 mi<sup>2</sup>, approximately, of which about 1,427 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--October 1976 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,667.52 ft above National Geodetic Vertical Datum of 1929 (South Dakota Department of Transportation bench mark).

REMARKS.--Records good except those for winter period, Nov. 11 to Mar. 17, and period of no gage-height record, Sept. 10-30, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--9 years, 52.6 ft<sup>3</sup>/s (38,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,830 ft<sup>3</sup>/s Mar. 19, 1985 (gage height, 11.14 ft); maximum gage height, 11.24 ft Apr. 13, 1979, no flow for many days in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 450 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 19	1130	*1,830	*11.14	Sept. 9	1000	472	8.45

Minimum daily discharge, 1.3 ft<sup>3</sup>/s Feb. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	70	30	18	3.9	75	457	164	45	14	19	34
2	14	112	29	17	3.6	100	440	163	41	13	18	100
3	13	85	29	17	3.3	96	418	158	38	12	18	230
4	13	51	29	16	3.0	110	395	160	38	12	17	183
5	13	48	28	16	2.7	100	370	138	36	11	16	126
6	17	46	28	15	2.4	98	351	120	35	11	14	100
7	29	45	28	15	2.2	94	329	114	33	9.9	13	81
8	28	44	28	15	1.9	90	306	102	32	8.8	13	179
9	23	42	27	14	1.7	88	289	103	29	7.8	13	361
10	21	33	27	14	1.6	85	278	92	27	7.0	16	300
11	22	29	27	13	1.5	80	245	89	33	6.8	13	250
12	23	25	27	13	1.5	130	231	90	31	7.5	21	200
13	23	27	26	12	1.4	190	240	84	29	7.4	28	170
14	25	28	26	12	1.4	280	219	80	28	6.5	21	140
15	35	29	25	11	1.4	450	217	82	26	7.3	19	125
16	59	30	25	11	1.3	600	190	87	23	6.2	20	110
17	64	32	25	10	1.3	900	181	84	22	7.1	26	100
18	72	30	24	9.5	1.4	1290	190	84	20	43	36	90
19	139	28	24	9.0	4.0	1770	180	80	18	237	28	80
20	156	32	23	8.5	14	1630	184	73	18	205	19	74
21	130	30	23	8.0	40	1040	178	68	16	90	19	70
22	106	29	23	7.7	120	858	182	65	15	59	21	66
23	93	32	22	7.3	120	769	240	63	13	42	26	64
24	81	30	22	6.8	70	673	329	59	13	41	31	63
25	71	29	21	6.5	70	609	304	57	13	35	25	62
26	67	28	21	6.1	65	591	234	53	14	28	24	60
27	65	30	20	5.6	100	625	209	50	13	24	24	59
28	62	29	20	5.3	90	589	205	44	15	23	25	58
29	57	30	19	4.9	---	546	192	47	15	20	27	57
30	55	32	19	4.6	---	511	183	47	15	19	27	56
31	55	---	18	4.3	---	485	---	46	---	20	33	---
TOTAL	1647	1165	763	333.1	730.5	15552	7966	2746	744	1041.3	670	3648
MEAN	53.1	38.8	24.6	10.7	26.1	502	266	88.6	24.8	33.6	21.6	122
MAX	156	112	30	18	120	1770	457	164	45	237	36	361
MIN	13	25	18	4.3	1.3	75	178	44	13	6.2	13	34
AC-FT	327	2310	1510	661	1450	30850	15800	5450	1480	2070	1330	7240
CAL YR 1984	TOTAL	35341.51		MEAN	96.6	MAX	1110	MIN	.20	AC-FT	70100	
WTR YR 1985	TOTAL	37005.9		MEAN	101	MAX	1770	MIN	1.3	AC-FT	73400	

06479529 STRAY HORSE CREEK NEAR CASTLEWOOD, SD

LOCATION.--Lat 44°43'52", long 96°57'23", in NE¼NE¼NW¼ sec.33, T.115 N., R.51 W., Hamlin County, Hydrologic Unit 10170202, on right bank at downstream side of bridge on State Highway 22, 3.5 mi east of Castlewood, 6.4 mi upstream from mouth, and 7.0 mi north of Dempster.

DRAINAGE AREA.--74.5 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1968 to Sept. 30, 1985 (discontinued).

REVISED REOCRDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,703.88 ft above National Geodetic Vertical Datum of 1929 (South Dakota Department of Transportation bench mark).

REMARKS.--Records good except those for winter period, Dec. 11 to Mar. 19, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--17 years, 12.2 ft<sup>3</sup>/s (8,840 acre-ft/yr); median of yearly mean discharges, 7.5 ft<sup>3</sup>/s (5,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,000 ft<sup>3</sup>/s Apr. 7, 1969 (gage height, 14.65 ft), from rating curve extended above 3,500 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow; no flow for many days most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 175 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 19	0745	227	7.48	Sept. 3	0630	423	8.20
Feb. 21	unknown	250	a7.98	Sept. 8	1600	*1,970	10.50
Mar. 18	unknown	1,800	a*10.62				

a Backwater from ice.

Minimum daily discharge, 0.14 ft<sup>3</sup>/s Feb. 6-9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.80	10	5.5	1.2	.20	70	13	20	4.7	1.4	1.2	3.3
2	.70	9.1	5.2	1.1	.20	50	12	17	5.0	1.2	1.4	153
3	.60	9.0	4.5	1.1	.20	20	12	12	5.1	.95	1.1	306
4	.50	9.0	4.2	1.1	.18	10	11	9.5	4.8	.63	.97	109
5	.50	8.7	4.1	1.0	.16	20	10	8.2	4.4	.45	.58	62
6	1.8	8.8	3.9	1.0	.14	20	9.6	7.3	3.8	.37	.58	41
7	2.9	8.7	3.6	1.0	.14	30	9.2	6.5	3.6	.33	.37	26
8	4.5	9.1	3.7	1.0	.14	50	8.8	5.9	3.5	.30	.43	629
9	2.5	8.5	3.8	.90	.14	75	8.4	5.6	3.0	.29	.60	416
10	2.1	7.3	4.0	.80	.30	100	8.3	5.4	3.0	.25	.56	127
11	1.9	7.2	3.8	.80	.20	150	8.0	5.1	4.0	.21	.56	70
12	1.8	6.9	3.9	.80	.20	200	7.8	4.9	3.8	.24	4.8	50
13	1.7	7.1	3.2	.80	.20	400	7.6	9.3	2.2	.25	5.6	59
14	2.7	7.4	2.9	.90	.20	600	7.5	13	1.7	.32	3.1	57
15	21	7.3	2.8	.80	.30	800	7.4	11	1.8	.30	2.4	44
16	23	7.6	2.9	.70	.80	700	7.4	14	1.6	.24	2.3	35
17	17	7.1	2.7	.60	5.0	600	7.4	19	1.5	.31	2.6	30
18	21	6.1	2.6	.80	25	480	7.4	13	1.1	12	2.3	26
19	175	5.5	2.5	.80	50	480	7.2	9.0	1.2	28	1.8	22
20	86	5.0	2.3	.60	100	273	7.4	6.1	1.0	16	1.4	19
21	41	4.9	2.3	.60	150	189	9.4	4.6	.88	8.2	1.2	16
22	27	4.9	2.2	.40	78	197	13	3.7	.72	4.8	1.4	17
23	21	4.9	2.2	.40	70	125	101	3.3	.61	3.0	2.1	17
24	17	5.3	2.1	.40	60	75	82	2.7	.56	2.8	2.3	17
25	15	6.2	1.9	.40	70	39	37	2.4	.71	2.3	2.1	16
26	14	6.4	1.8	.40	60	44	23	2.3	1.6	1.8	2.2	14
27	13	6.4	1.6	.40	60	54	18	2.3	1.9	1.4	2.2	13
28	12	6.0	1.5	.30	80	34	16	2.3	2.5	1.2	2.3	11
29	11	6.0	1.4	.20	---	24	13	3.2	2.2	1.0	2.2	11
30	10	5.9	1.3	.20	---	19	12	3.4	1.7	.96	1.8	11
31	9.8	---	1.2	.20	---	15	---	4.3	---	1.2	2.8	---
TOTAL	558.80	212.3	91.6	21.70	811.70	5943	501.8	236.3	74.18	92.70	57.25	2427.3
MEAN	18.0	7.08	2.95	.70	29.0	192	16.7	7.62	2.47	2.99	1.85	80.9
MAX	175	10	5.5	1.2	150	800	101	20	5.1	.28	5.6	629
MIN	.50	4.9	1.2	.20	.14	10	7.2	2.3	.56	.21	.37	3.3
AC-FT	111	421	182	43	1610	11790	995	469	147	184	114	4810
CAL YR 1984	TOTAL	7986.32		MEAN	21.8	MAX	502	MIN	.11	AC-FT	15840	
WTR YR 1985	TOTAL	11028.63		MEAN	30.2	MAX	800	MIN	.14	AC-FT	21880	



## BIG SIOUX RIVER BASIN

06479640 HIDEWOOD CREEK NEAR ESTELLINE, SD

LOCATION.--Lat 44°36'42", long 96°54'17", in SW¼ sec.12, T.113 N., R.51 W., Hamlin County, Hydrologic Unit 10170202, on left bank at upstream side of highway bridge, 2.7 mi north of Estelline, 2.8 mi southeast of Dempster, and 4.7 mi upstream from mouth.

DRAINAGE AREA.--164 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1968 to Sept. 30, 1985 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,665 ft.

REMARKS.--Records good except those for winter period, Nov. 28 to Mar. 19, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--17 years, 25.8 ft<sup>3</sup>/s (18,690 acre-ft/yr); median of yearly mean discharges, 19 ft<sup>3</sup>/s (13,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,630 ft<sup>3</sup>/s Apr. 7, 1969 (gage height, 11.36 ft); maximum gage height, 11.55 ft Apr. 8, 1969 (backwater from collapsed bridge), no flow at times in 1969, 1971, 1974-77, 1981-84.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	0045	a	a*8.37	Mar. 20	0015	*1,020	8.10

a Backwater from ice.

Minimum daily discharge, 1.3 ft<sup>3</sup>/s Feb. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	51	26	7.3	2.4	48	148	65	18	6.9	5.3	7.1
2	3.9	56	22	7.0	2.3	45	137	61	17	6.3	4.6	12
3	3.5	45	21	6.9	2.2	43	128	57	16	5.8	4.2	65
4	3.4	46	21	6.8	2.1	41	114	52	16	5.4	4.1	68
5	3.3	47	20	6.7	2.0	39	105	46	15	4.7	3.3	117
6	4.2	45	21	6.4	2.0	39	96	43	14	4.3	2.8	63
7	7.2	45	20	6.2	1.8	42	87	40	13	4.1	2.6	47
8	12	44	18	6.0	1.6	45	80	34	12	4.0	2.2	45
9	11	43	18	5.8	1.5	52	74	31	11	3.8	2.2	146
10	9.3	40	17	5.6	1.5	60	70	29	11	3.4	2.3	156
11	8.0	40	17	5.4	1.4	70	66	28	12	3.1	1.8	103
12	7.3	40	17	5.1	1.4	80	64	29	12	2.9	14	85
13	6.3	40	16	5.4	1.4	100	63	29	11	2.9	17	87
14	18	40	15	5.2	1.4	130	62	30	11	3.4	12	87
15	56	42	14	4.8	1.3	180	61	33	12	3.4	12	85
16	61	43	14	5.0	7.0	500	59	39	10	3.0	11	79
17	50	39	13	4.8	50	600	59	39	9.2	3.1	8.1	75
18	45	35	13	4.3	52	700	56	33	8.4	7.0	6.1	72
19	190	32	12	4.0	55	850	54	29	7.6	6.3	5.4	69
20	182	29	12	3.8	60	822	53	26	7.0	8.0	4.7	65
21	103	29	12	3.7	70	675	57	23	6.8	9.8	4.2	62
22	77	33	11	3.5	78	666	67	21	6.2	8.2	4.3	63
23	68	30	11	3.4	90	506	145	21	5.8	6.1	7.2	62
24	63	32	10	3.3	70	441	159	20	5.5	9.3	8.3	59
25	62	34	10	3.2	64	372	114	18	5.8	9.8	7.7	57
26	60	36	11	3.0	58	368	99	17	9.7	7.4	7.6	56
27	58	37	10	2.9	54	333	93	16	12	6.5	7.4	54
28	55	36	9.2	2.8	50	264	83	16	10	6.3	7.2	52
29	54	35	8.7	2.7	---	223	76	17	9.0	5.4	7.4	52
30	52	30	8.2	2.6	---	187	69	17	8.0	5.2	7.2	51
31	51	---	7.8	2.5	---	164	---	17	---	5.5	7.1	---
TOTAL	1389.5	1174	455.9	146.1	784.3	8685	2598	976	322.0	171.3	201.3	2101.1
MEAN	44.8	39.1	14.7	4.71	28.0	280	86.6	31.5	10.7	5.53	6.49	70.0
MAX	190	56	26	7.3	90	850	159	65	18	9.8	17	156
MIN	3.3	29	7.8	2.5	1.3	39	53	16	5.5	2.9	1.8	7.1
AC-FT	276	2330	904	290	1560	17230	5150	1940	639	340	399	4170
CAL YR 1984	TOTAL	20377.26		MEAN	55.7	MAX	760	MIN	.00	AC-FT	40420	
WTR YR 1985	TOTAL	19004.5		MEAN	52.1	MAX	850	MIN	1.3	AC-FT	37700	



## BIG SIOUX RIVER BASIN

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06479980 MEDARY CREEK NEAR BROOKINGS, SD

LOCATION.--Lat 44°13'27", long 96°46'06", in NE¼NE¼NE¼ sec.25, T.109 N., R.50 W., Brookings County, Hydrologic Unit 10170202, on right bank 400 ft downstream from county highway bridge, 5.2 mi downstream from Deer Creek, 4.1 mi upstream from mouth, and 6.1 mi southeast of Brookings.

DRAINAGE AREA.--200 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1980 to current year.

REVISED RECORDS.--WDR SD-82-1: 1981. WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,570.20 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, Dec. 1 to Mar. 14, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--5 years, 65.3 ft<sup>3</sup>/s (47,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,590 ft<sup>3</sup>/s June 21, 1984 (gage height, 11.27 ft); no flow at times in 1981, 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 20	0645	745	8.50	Apr. 24	0630	694	8.30
Feb. 23	0045	350	a8.29	June 2	0730	344	6.69
Mar. 15	1745	*1,700	*10.11	Sept. 7	0945	156	5.32

a Backwater from ice.

Minimum daily discharge, 1.0 ft<sup>3</sup>/s Feb. 18-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	87	40	17	8.2	50	77	91	276	15	4.1	7.5
2	9.0	79	40	16	7.8	30	75	81	331	12	3.6	12
3	9.0	81	40	16	7.2	20	74	74	224	9.0	3.2	25
4	9.0	82	40	16	6.7	30	74	66	134	8.9	2.8	48
5	9.0	78	40	16	6.1	50	73	60	99	8.5	2.9	93
6	15	76	40	16	5.5	50	69	55	81	7.7	3.0	116
7	20	74	40	16	4.7	50	66	52	69	7.6	3.3	150
8	30	73	40	15	4.5	50	63	47	60	7.0	3.4	121
9	25	71	39	15	4.0	50	60	42	53	6.2	1.8	86
10	20	68	38	14	3.5	50	59	38	47	5.7	1.9	65
11	20	64	37	14	3.0	60	59	36	48	5.6	1.8	59
12	15	63	34	14	2.4	250	59	36	48	5.8	10	54
13	15	62	32	13	2.0	900	61	34	47	6.6	15	63
14	15	66	30	13	1.7	1100	67	38	44	7.2	12	69
15	50	65	30	13	1.5	1180	70	70	41	7.8	7.4	68
16	140	60	30	12	1.3	1290	70	98	37	7.7	5.6	63
17	100	61	30	12	1.1	1260	67	109	33	7.9	5.6	58
18	179	57	29	11	1.0	748	64	92	30	7.7	4.2	55
19	370	56	28	11	1.0	588	63	71	27	7.3	3.8	51
20	699	49	26	10	1.0	493	65	54	25	6.8	3.5	45
21	570	55	24	10	10	345	72	43	23	7.3	3.5	39
22	357	57	23	10	100	248	99	36	21	6.1	4.2	39
23	232	54	22	10	300	224	384	33	18	5.6	5.4	38
24	183	56	22	10	200	190	642	30	18	6.5	5.4	37
25	159	62	21	10	100	165	401	28	15	6.8	7.4	35
26	146	66	20	9.8	50	134	233	26	16	18	8.4	34
27	137	67	20	9.6	60	128	169	26	18	11	7.3	32
28	126	68	19	9.4	80	121	138	24	18	6.5	7.2	30
29	113	61	18	9.2	---	105	119	44	18	6.0	8.8	30
30	101	58	18	8.8	---	93	102	82	17	4.3	8.8	31
31	94	---	17	8.6	---	83	---	186	---	4.2	7.2	---
TOTAL	3976.0	1976	927	385.4	974.2	10135	3694	1802	1936	240.3	172.5	1653.5
MEAN	128	65.9	29.9	12.4	34.8	327	123	58.1	64.5	7.75	5.56	55.1
MAX	699	87	40	17	300	1290	642	186	331	18	15	150
MIN	9.0	49	17	8.6	1.0	20	59	24	15	4.2	1.8	7.5
AC-FT	789	3920	1840	764	1930	20100	7330	3570	3840	477	342	3280
CAL YR 1984	TOTAL	54726.1		MEAN	150	MAX	2310	MIN	7.0	AC-FT	108500	
WTR YR 1985	TOTAL	27871.9		MEAN	76.4	MAX	1290	MIN	1.0	AC-FT	55280	

## BIG SIOUX RIVER BASIN

06480000 BIG SIOUX RIVER NEAR BROOKINGS, SD

LOCATION.--Lat 44°10'48", long 96°44'55", in NW¼NW¼ sec.8, T.108 N., R.49 W., Moody County, Hydrologic Unit 10170203, on right bank 3 ft downstream from highway bridge, 2.2 mi downstream from Medary Creek, and 9.5 mi southeast of Brookings.

DRAINAGE AREA.--3,898 mi<sup>2</sup>, approximately, of which about 1,479 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--August 1953 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,551.91 ft above National Geodetic Vertical Datum of 1929. Prior to May 30, 1959, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, Nov. 27 to Mar. 17, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--32 years, 191 ft<sup>3</sup>/s (138,400 acre-ft/yr); median of yearly mean discharges, 130 ft<sup>3</sup>/s (94,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,900 ft<sup>3</sup>/s Apr. 9, 1969 (gage height, 14.77 ft); no flow at times in 1956, 1959, 1976, 1977, 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 22	0100	2,350	10.16	Apr. 24	2115	1,740	9.65
Mar. 19	0445	*8,440	*12.51	Sept. 16	1115	1,090	7.34

Minimum daily discharge, 45 ft<sup>3</sup>/s Jan. 30 to Feb. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	100	630	250	110	45	350	1480	1060	833	175	119	133
2	97	557	200	110	45	300	1420	993	935	165	113	151
3	92	536	170	100	45	250	1370	938	900	157	110	193
4	87	535	200	95	45	250	1320	891	769	148	106	239
5	84	529	230	90	45	250	1280	833	655	140	103	496
6	88	513	300	90	45	250	1230	792	581	131	99	669
7	122	497	280	90	45	250	1180	758	517	125	93	800
8	169	484	230	90	45	200	1120	712	457	122	90	845
9	206	473	200	90	45	200	1080	673	406	117	86	812
10	218	449	200	85	45	200	1040	633	362	113	85	747
11	214	419	200	80	45	200	1000	620	349	108	82	739
12	201	404	200	80	45	300	971	601	340	104	143	799
13	193	408	200	80	50	500	953	576	329	102	199	901
14	189	417	200	80	50	800	941	576	317	104	212	1000
15	273	417	200	75	50	1300	940	642	301	106	205	1070
16	483	363	200	75	50	2000	930	719	280	105	192	1080
17	675	358	200	70	50	4000	909	748	259	97	187	1060
18	797	376	200	70	50	6770	888	730	240	98	172	1000
19	1110	339	200	65	50	7740	863	687	227	101	160	926
20	1550	338	190	65	60	6300	854	637	217	104	151	840
21	2030	311	180	60	100	5090	860	589	207	142	144	754
22	2240	299	170	60	200	4290	909	543	192	204	135	702
23	1830	330	160	60	450	3800	1240	504	181	201	133	662
24	1520	399	160	55	600	3400	1650	464	173	171	132	621
25	1290	371	150	55	550	2900	1690	439	165	175	138	596
26	1090	364	140	55	500	2420	1570	415	170	176	146	571
27	971	320	140	55	450	2090	1460	399	181	169	145	548
28	887	300	130	50	400	1840	1360	392	189	150	141	524
29	821	300	130	50	---	1720	1270	465	193	137	138	508
30	762	290	120	45	---	1630	1150	581	185	129	135	492
31	691	---	120	45	---	1550	---	716	---	123	133	---
TOTAL	21080	12326	5850	2280	4200	63140	34928	20326	11110	4199	4227	20478
MEAN	680	411	189	73.5	150	2037	1164	656	370	135	136	683
MAX	2240	630	300	110	600	7740	1690	1060	935	204	212	1080
MIN	84	290	120	45	45	200	854	392	165	97	82	133
AC-FT	4181	24450	11600	4520	8330	125200	69280	40320	22040	8330	8380	40620
CAL YR 1984 TOTAL		291788		MEAN	797	MAX	12600	MIN	26	AC-FT	578800	
WTR YR 1985 TOTAL		204144		MEAN	559	MAX	7740	MIN	45	AC-FT	404900	

## BIG SIOUX RIVER BASIN

219

06480400 SPRING CREEK NEAR FLANDREAU, SD

LOCATION.--Lat 44°07'18", long 96°35'19", in SE¼NE¼NE¼ sec.33, T.108 N., R.47 W., Moody County, Hydrologic Unit 10170203, on left bank at downstream side of bridge on State Highway 13, 5.0 mi north of Flandreau, and 6.6 mi upstream from mouth.

DRAINAGE AREA.--63.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,580 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Nov. 28 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,030 ft<sup>3</sup>/s June 20, 1984 (gage height, 15.72 ft); minimum daily discharge, 2.4 ft<sup>3</sup>/s Aug. 8, 9, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 12	0600	*700	*a14.53	May 31	1345	392	12.28
Apr. 23	0430	513	12.72	Sept. 5	0145	470	12.89
May 30	2130	430	12.43				

a Backwater from ice.

Minimum daily discharge, 2.4 ft<sup>3</sup>/s Aug. 8, 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	14	11	8.0	3.9	17	15	18	129	4.7	3.5	4.1
2	6.8	11	9.5	8.0	3.8	16	16	16	55	4.2	2.9	12
3	6.6	13	8.9	8.2	3.8	14	16	14	25	4.0	2.7	14
4	6.6	14	8.8	8.2	3.7	13	16	12	19	3.6	2.7	21
5	6.7	14	8.8	8.2	3.7	13	17	11	18	3.1	2.7	188
6	9.9	13	8.8	7.9	3.7	12	16	12	14	3.1	2.7	139
7	16	13	8.7	7.6	3.7	12	15	12	12	3.0	2.6	53
8	18	13	8.6	7.3	3.6	18	14	9.1	10	2.8	2.4	28
9	14	13	8.5	7.0	3.6	45	13	7.0	7.7	3.0	2.4	18
10	11	12	8.4	6.8	3.6	160	13	6.3	7.3	2.9	2.8	17
11	9.7	9.9	8.3	6.5	3.6	300	13	5.8	8.7	2.6	2.7	14
12	8.8	11	8.2	6.1	3.6	500	14	7.6	9.4	2.6	10	11
13	8.3	12	6.4	5.8	3.5	240	15	7.2	8.1	2.5	13	23
14	12	14	4.5	5.4	3.4	300	16	11	7.2	3.3	7.8	32
15	38	13	5.5	5.3	3.5	330	17	25	6.5	4.0	4.5	24
16	54	13	7.0	5.4	3.6	290	15	31	6.1	3.5	9.0	20
17	40	12	7.6	4.9	3.8	207	14	23	5.4	2.9	11	17
18	37	11	7.0	4.7	4.0	124	14	17	4.9	3.2	7.1	14
19	158	8.9	6.5	4.6	10	89	14	14	4.6	3.1	4.7	13
20	110	7.9	6.0	4.4	25	60	16	11	4.5	2.8	4.1	11
21	60	8.6	6.4	4.2	130	42	25	8.0	4.2	2.8	3.8	9.7
22	37	11	6.8	4.1	80	33	134	6.5	3.8	2.8	4.2	10
23	28	12	6.2	4.1	44	30	407	6.2	3.6	2.6	7.5	11
24	22	13	6.9	4.1	27	30	137	6.2	3.3	4.9	7.2	11
25	21	14	7.5	4.1	22	24	56	6.1	3.1	8.3	6.3	9.6
26	22	15	8.0	4.1	18	22	38	5.8	5.5	5.7	4.8	9.5
27	21	14	7.6	4.1	21	21	31	7.0	7.9	3.9	4.0	9.0
28	19	14	7.4	4.0	18	20	25	7.0	7.4	3.4	3.9	8.0
29	16	13	7.4	4.0	---	19	22	21	6.3	3.2	4.1	8.1
30	15	12	8.0	3.9	---	17	20	112	5.4	3.2	4.1	8.9
31	14	---	8.0	3.9	---	16	---	246	---	3.7	4.1	---
TOTAL	853.2	369.3	237.2	174.9	461.1	3034	1194	701.8	412.9	109.4	155.3	767.9
MEAN	27.5	12.3	7.65	5.64	16.5	97.9	39.8	22.6	13.8	3.53	5.01	25.6
MAX	158	15	11	8.2	130	500	407	246	129	8.3	13	188
MIN	6.6	7.9	4.5	3.9	3.4	12	13	5.8	3.1	2.5	2.4	4.1
AC-FT	169	733	470	347	915	6020	2370	1390	819	217	308	1520
CAL YR 1984	TOTAL	16165.6		MEAN	44.2	MAX	1420	MIN	4.5	AC-FT	32060	
WTR YR 1985	TOTAL	8471.0		MEAN	23.2	MAX	500	MIN	2.4	AC-FT	16800	

## BIG SIOUX RIVER BASIN

06480650 FLANDREAU CREEK ABOVE FLANDREAU, SD

LOCATION.--Lat 44°03'45", long 96°29'15", in SE¼NE¼ sec.20, T.107 N., R.47 W., Moody County, Hydrologic Unit 10170203, on right bank 500 ft downstream from county highway bridge, 5.9 mi upstream from mouth, and 5.2 mi east of Flandreau.

DRAINAGE AREA.--100 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1981 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,555 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Feb. 20 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,650 ft<sup>3</sup>/s June 20, 1984 (gage height, 11.02 ft); no flow at times in 1982.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 20	1930	163	5.81	Apr. 23	0230	*1,280	*9.14
Feb. 22	1215	250	a6.64	May 31	0900	972	8.53
Mar. 12	2345	950	a9.09	Sept. 6	0830	557	7.67

a Backwater from ice.

Minimum daily discharge, 2.1 ft<sup>3</sup>/s Feb. 10-12, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	22	17	4.7	2.8	30	26	55	565	14	3.5	7.7
2	9.0	20	15	4.6	2.8	30	25	52	210	10	3.3	9.6
3	8.6	20	14	4.5	2.6	25	27	45	102	9.5	3.1	18
4	9.1	20	11	4.7	2.3	25	30	38	66	7.8	3.0	27
5	8.8	20	11	4.6	2.2	25	31	34	54	6.7	2.8	303
6	10	23	9.1	4.8	2.2	25	30	31	44	6.0	2.6	464
7	15	23	8.9	4.7	2.4	30	23	33	36	5.3	2.4	235
8	19	24	9.6	4.7	2.3	40	19	29	30	5.0	2.2	128
9	19	23	11	4.5	2.2	40	16	21	25	4.7	2.2	76
10	17	22	12	4.2	2.1	50	15	16	21	4.1	2.4	57
11	17	20	13	3.9	2.1	550	16	14	21	3.8	2.5	47
12	16	20	13	3.9	2.1	850	16	14	22	3.2	7.6	40
13	16	19	12	3.9	2.2	700	18	16	22	3.6	20	59
14	16	21	11	3.3	2.1	400	23	23	19	4.0	21	76
15	28	23	10	3.3	2.2	450	28	44	17	4.1	15	65
16	59	20	11	3.0	2.4	550	27	70	15	4.2	10	51
17	88	19	10	3.0	2.4	346	22	79	12	3.8	16	43
18	73	18	10	3.0	2.5	197	21	62	11	3.9	16	38
19	144	16	9.5	3.0	3.0	154	24	42	10	3.6	11	32
20	170	15	9.0	3.0	25	125	29	31	9.8	3.4	8.4	27
21	142	16	9.0	3.0	150	95	44	24	9.1	3.1	6.9	24
22	76	16	7.9	3.0	200	74	745	19	8.2	2.8	6.6	23
23	50	17	7.0	3.0	125	66	1030	17	7.5	2.9	8.9	27
24	40	19	6.5	3.0	65	65	387	15	6.8	5.0	11	28
25	37	20	6.3	3.0	40	60	174	15	6.5	6.2	11	26
26	35	23	6.3	3.0	35	49	115	14	11	5.9	10	24
27	34	23	6.0	3.0	30	45	91	14	21	5.1	8.2	23
28	31	18	6.0	3.0	40	42	78	14	26	4.5	8.1	21
29	28	18	6.0	3.0	---	38	67	26	22	3.9	8.9	20
30	25	17	5.5	3.0	---	35	59	69	17	3.5	8.2	22
31	24	---	5.2	2.9	---	31	---	727	---	3.5	7.7	---
TOTAL	1273.8	595	298.8	112.2	754.9	5242	3256	1703	1446.9	157.1	250.5	2041.3
MEAN	41.1	19.8	9.64	3.62	27.0	169	109	54.9	48.2	5.07	8.08	68.0
MAX	170	24	17	4.8	200	850	1030	727	565	14	21	464
MIN	8.6	15	5.2	2.9	2.1	25	15	14	6.5	2.8	2.2	7.7
AC-FT	253	1180	593	223	1500	10400	6460	3380	2870	312	497	4050
CAL YR 1984	TOTAL	25496.6		MEAN	69.7	MAX	2050	MIN	5.0	AC-FT	50570	
WTR YR 1985	TOTAL	17131.5		MEAN	46.9	MAX	1030	MIN	2.1	AC-FT	33980	



## 06481000 BIG SIOUX RIVER NEAR DELL RAPIDS, SD

LOCATION.--Lat 43°47'25", long 96°44'42", in NW¼NW¼ sec.29, T.104 N., R.49 W., Minnehaha County, Hydrologic Unit 10170203, on left bank at downstream side of highway bridge, 0.2 mi downstream from confluence of divided channels, and 3.0 mi southwest of Dell Rapids.

DRAINAGE AREA.--4,483 mi<sup>2</sup>, approximately, of which about 1,479 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--May 1948 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,455.99 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 11, 1949, nonrecording gage and Nov. 11, 1949, to Sept. 30, 1951, water-stage recorder, at present site at datum 0.04 ft lower.

REMARKS.--Records good except those for winter period, Nov. 26 to Mar. 17, which are poor. National Weather Service gage-height telemeter at station.

AVERAGE DISCHARGE.--37 years, 297 ft<sup>3</sup>/s (215,200 acre-ft/yr); median of yearly mean discharges, 200 ft<sup>3</sup>/s (145,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 41,300 ft<sup>3</sup>/s Apr. 9, 1969 (gage height, 16.47 ft); no flow Aug. 25 to Oct. 17, 1976.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 24	1630	2,460	9.80	May 31	2330	2,180	9.08
Mar. 21	1030	*8,600	*13.57	Sept. 7	1630	1,050	6.65
Apr. 24	0745	3,780	11.42	Sept. 17	1030	1,070	6.64

Minimum daily discharge, 65 ft<sup>3</sup>/s Feb. 1-19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	193	803	290	140	65	550	2410	1720	2100	247	151	168
2	183	739	270	130	65	500	2260	1540	1800	236	142	176
3	175	689	220	130	65	470	2110	1400	1450	226	140	183
4	170	639	200	120	65	420	2070	1290	1320	214	141	193
5	163	618	200	120	65	350	1960	1190	1150	203	132	255
6	165	601	220	110	65	320	1820	1110	961	196	124	690
7	170	591	250	110	65	250	1710	1030	822	190	118	1000
8	180	565	300	110	65	250	1610	970	718	180	116	950
9	207	543	330	100	65	250	1530	915	628	170	115	880
10	239	516	320	100	65	250	1460	852	563	162	115	831
11	263	496	310	100	65	400	1390	801	517	155	115	768
12	276	474	300	95	65	600	1330	741	485	149	141	729
13	275	450	300	90	65	1000	1270	721	463	144	150	756
14	276	440	300	90	65	1500	1240	716	442	145	162	850
15	315	421	300	85	65	2500	1220	769	424	140	206	965
16	363	425	310	85	65	3600	1190	851	406	137	225	1030
17	471	411	320	80	65	5000	1170	921	374	137	235	1060
18	662	375	320	80	65	4620	1150	955	351	136	240	1070
19	1020	342	310	80	65	5200	1120	933	337	131	217	1040
20	1360	349	290	75	100	7620	1090	859	322	121	202	972
21	1580	321	270	75	150	8430	1160	781	303	119	189	904
22	1810	374	250	75	300	7530	1420	717	290	121	180	836
23	2110	359	240	75	400	6130	3090	669	276	135	185	765
24	2400	352	220	75	300	5090	3710	629	262	217	173	717
25	2370	365	210	70	300	4520	3090	585	254	217	168	686
26	1990	330	200	70	400	4150	2790	548	263	193	165	654
27	1530	320	180	70	500	3750	2700	521	253	188	165	633
28	1240	310	170	70	600	3450	2470	497	249	185	175	616
29	1070	310	160	70	---	3100	2180	542	257	181	181	604
30	945	300	150	70	---	2810	1940	681	257	169	175	589
31	861	---	140	70	---	2590	---	1540	---	160	169	---
TOTAL	25032	13828	7850	2820	4285	87200	55660	27994	18297	5304	5112	21570
MEAN	807	461	253	91.0	153	2813	1855	903	610	171	165	719
MAX	2400	803	330	140	600	8430	3710	1720	2100	247	240	1070
MIN	163	300	140	70	65	250	1090	497	249	119	115	168
AC-FT	4965	27430	15570	5590	8500	173000	110400	55530	36290	10520	10140	42780
CAL YR 1984	TOTAL	429424		MEAN	1173	MAX	16500	MIN	64	AC-FT	851800	
WTR YR 1985	TOTAL	274952		MEAN	753	MAX	8430	MIN	65	AC-FT	545400	



LOCATION.--Lat 43°50'53", long 96°50'10", in NE¼NW¼NE¼ sec.4, T.104 N., R.50 W., Minnehaha County, Hydrologic Unit 10170203, on right bank near downstream side of county highway bridge, 5.6 mi southeast of Chester.

PERIOD OF RECORD.--Aug. 16, 1984, to Sept. 30, 1984.

REMARKS.--Records good. Two observations of water temperature and specific conductance were made during the period.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft<sup>3</sup>/s and maximum (\*) during period of August to September 1984:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Aug. 16	1215	*29	*2.95				

Minimum daily discharge, 3.0 ft<sup>3</sup>/s Sept. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND. WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984  
MEAN VALUES

[illegible]

## BIG SIOUX RIVER BASIN

223

06481480 SKUNK CREEK NEAR CHESTER, SD

LOCATION.--Lat 43°50'53", long 96°50'10", in NE¼NW¼NE¼ sec.4, T.104 N., R.50 W., Minnehaha County, Hydrologic Unit 10170203, on right bank near downstream side of county highway bridge, 5.6 mi southeast of Chester.

DRAINAGE AREA.--53.2 mi<sup>2</sup>.

PERIOD OF RECORD.--Aug. 16, 1984, to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,557.23 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for winter period, Jan. 6 to Mar. 16, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 898 ft<sup>3</sup>/s Mar. 18, 1985 (gage height, 6.71 ft); minimum daily discharge, 0.49 ft<sup>3</sup>/s Aug. 8, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 50 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 20	1100	87	3.69	May 15	0900	75	3.17
Mar. 18	0930	*898	*6.71	May 30	2030	150	3.98
Apr. 23	1600	335	5.31				

Minimum daily discharge, 0.49 ft<sup>3</sup>/s Aug. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	28	7.0	4.1	2.0	25	300	155	94	5.9	.82	1.1
2	3.0	30	7.0	3.3	2.0	20	288	144	75	5.1	.68	1.2
3	2.7	24	7.0	3.1	2.0	15	285	145	67	4.2	.70	1.3
4	2.6	23	7.0	3.0	2.0	10	283	140	63	3.7	.78	1.3
5	2.6	22	6.0	3.3	2.0	9.0	275	116	56	3.0	.76	1.4
6	3.1	20	6.0	3.3	2.0	10	268	106	50	2.6	.61	1.4
7	3.4	20	6.0	3.0	2.0	10	263	90	45	2.3	.58	1.8
8	4.5	19	7.4	3.0	2.0	15	253	84	40	2.2	.49	3.0
9	4.9	18	9.5	3.0	2.0	20	242	76	33	2.0	.63	3.2
10	5.7	18	11	3.0	2.0	30	228	67	31	1.5	.87	3.0
11	6.0	18	12	3.0	2.0	50	213	64	31	1.3	.64	2.5
12	6.1	20	11	3.0	2.0	80	205	61	26	1.2	3.4	2.9
13	6.2	17	9.5	3.0	2.0	120	194	50	23	1.2	1.9	4.4
14	7.0	16	8.5	3.0	2.0	200	183	56	21	1.4	1.4	4.6
15	13	15	8.7	3.0	2.0	300	173	73	19	1.6	1.2	5.8
16	23	14	9.0	3.0	4.0	440	157	71	18	1.4	1.4	5.9
17	27	13	9.0	3.0	6.0	746	156	64	16	1.2	1.4	5.0
18	29	12	8.5	3.0	8.0	774	139	61	15	1.2	1.2	3.6
19	69	10	7.1	3.0	10	652	132	57	13	1.1	1.2	2.8
20	84	9.0	7.1	3.0	15	556	135	52	11	.83	.80	2.2
21	73	10	7.1	2.5	20	491	138	48	10	.83	.79	1.6
22	68	10	6.5	2.5	25	445	169	43	9.0	.83	.83	1.7
23	62	11	5.7	2.5	30	434	313	39	8.0	.78	1.4	1.8
24	55	11	5.4	2.5	25	416	282	35	6.9	3.4	1.1	1.6
25	50	12	4.4	2.5	20	401	259	31	6.1	1.6	.94	1.5
26	45	13	4.6	2.5	20	390	241	27	7.5	1.1	.91	1.5
27	42	10	5.0	2.5	20	373	225	26	7.8	.84	.83	1.4
28	37	8.8	4.5	2.5	25	360	197	25	7.8	.83	1.5	1.3
29	34	8.0	4.5	2.5	---	346	180	38	7.7	.83	1.8	1.3
30	30	8.0	4.5	2.0	---	330	165	69	6.8	.83	1.2	1.5
31	29	---	4.4	2.0	---	310	---	112	---	.83	1.1	---
TOTAL	831.1	467.8	220.9	88.6	258.0	8378.0	6541	2225	824.6	57.63	33.86	73.6
MEAN	26.8	15.6	7.13	2.86	9.21	270	218	71.8	27.5	1.86	1.09	2.45
MAX	84	30	12	4.1	30	774	313	155	94	5.9	3.4	5.9
MIN	2.6	8.0	4.4	2.0	2.0	9.0	132	25	6.1	.78	.49	1.1
AC-FT	165	928	438	176	512	16620	12970	4410	1640	114	67	146
WTR YR 1985	TOTAL	20000.09		MEAN	54.8	MAX	774	MIN	.49	AC-FT	39670	

LOCATION.--Lat 43°40'03", long 96°55'47", in SW<sup>1</sup>/<sub>4</sub>SW<sup>1</sup>/<sub>4</sub>NW<sup>1</sup>/<sub>4</sub> sec.2, T.102 N., R.51 W., Minnehaha County, Hydrologic Unit 10170203, on right bank near downstream side of bridge, 0.8 mi upstream from Skunk Creek, and 3.5 mi northeast of Hartford.

PERIOD OF RECORD.--Aug. 2, 1984, to Sept. 30, 1984.

REMARKS.--Records good. Several observations of water temperature and specific conductance were made during the year.

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Aug. 2	1200	*7.6	*3.04				

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984  
MEAN VALUES

[illegible]

## 06481489 WEST BRANCH SKUNK CREEK NEAR HARTFORD, SD

LOCATION.--Lat 43°40'03", long 96°55'47", in SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$  sec.2, T.102 N., R.51 W., Minnehaha County, Hydrologic Unit 10170203, on right bank near downstream side of bridge, 0.8 mi upstream from Skunk Creek, and 3.5 mi northeast of Hartford.

DRAINAGE AREA.--80.5 mi<sup>2</sup>.

PERIOD OF RECORD.--Aug. 2, 1984, to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,505 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Feb. 10 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD --Maximum discharge, 740 ft<sup>3</sup>/s Mar. 16, 1985 (gage height, 6.79 ft); minimum daily discharge, 0.09 ft<sup>3</sup>/s Feb. 9, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	0315	*740	a*6.79	Apr. 23	1130	324	5.65
Apr. 5	0300	108	4.58				

a Backwater from ice.

Minimum daily discharge, 0.09 ft<sup>3</sup>/s Feb. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	5.4	3.6	1.8	.22	4.0	11	25	23	1.5	.68	1.2
2	2.4	5.0	3.5	1.1	.19	3.0	12	19	8.9	1.3	.59	1.4
3	2.3	5.6	3.0	1.1	.16	3.0	11	16	6.5	1.3	.58	1.6
4	2.1	5.8	2.3	1.2	.15	2.0	47	13	6.2	1.0	.65	1.3
5	1.9	5.6	2.1	1.2	.15	2.0	83	12	6.1	.98	.70	1.9
6	2.0	5.5	1.5	1.2	.15	5.0	52	11	5.3	.86	.73	2.0
7	2.3	5.6	2.1	1.1	.14	10	34	9.5	4.8	.76	.85	1.6
8	3.5	5.5	2.4	.80	.10	15	23	8.2	4.1	.74	.68	1.4
9	3.1	5.3	2.7	.60	.09	20	16	7.5	3.6	.73	.75	1.3
10	2.2	3.6	3.0	.60	.12	30	15	6.9	3.4	.56	.75	1.4
11	2.3	4.4	3.1	.60	.15	50	14	6.7	3.7	.52	.81	1.3
12	2.5	4.0	3.4	.55	.20	100	12	6.2	3.7	.56	3.3	1.5
13	2.7	4.2	3.6	.56	.25	150	11	5.9	3.5	.76	2.4	3.9
14	2.3	4.6	3.5	.59	.30	180	11	7.5	3.3	1.2	1.2	3.4
15	9.1	4.2	3.7	.52	.40	300	14	17	2.9	1.1	.84	2.4
16	12	3.5	5.4	.51	.50	606	14	24	2.6	.91	.96	1.7
17	9.6	4.6	4.5	.42	1.0	309	11	16	2.7	.67	1.2	1.7
18	9.3	3.8	3.6	.40	1.5	229	9.8	11	1.9	.71	1.2	1.6
19	60	3.4	3.4	.40	2.0	157	8.8	8.5	1.9	.62	.98	1.4
20	65	3.3	3.4	.40	3.0	114	9.4	7.3	1.8	.57	.92	1.1
21	29	3.2	3.5	.40	5.0	86	19	6.2	1.6	.57	.72	.91
22	16	3.5	3.0	.40	8.0	60	49	5.7	1.5	.62	.74	1.1
23	12	3.5	3.1	.40	10	52	265	5.3	1.3	.56	1.5	1.2
24	11	3.7	2.5	.38	6.0	42	178	4.8	1.2	5.0	1.3	1.1
25	9.6	4.4	2.2	.40	5.0	30	101	4.2	1.0	2.5	.98	1.2
26	8.9	4.4	2.4	.33	5.0	22	76	3.9	1.9	1.3	1.0	1.2
27	8.6	3.8	2.6	.32	4.0	17	66	3.7	2.2	.77	.98	1.2
28	7.5	3.7	3.0	.33	5.0	15	53	3.5	1.8	.60	1.5	.98
29	7.0	3.8	2.6	.25	---	13	40	8.6	1.9	.70	2.5	1.0
30	6.2	3.1	2.2	.23	---	10	30	26	1.7	.60	1.5	1.2
31	5.9	---	1.9	.21	---	9.1	---	24	---	.64	1.4	---
TOTAL	320.6	130.0	92.8	19.30	58.77	2645.1	1296.0	334.1	116.0	31.21	34.89	46.19
MEAN	10.3	4.33	2.99	.62	2.10	85.3	43.2	10.8	3.87	1.01	1.13	1.54
MAX	65	5.8	5.4	1.8	10	606	265	26	23	5.0	3.3	3.9
MIN	1.9	3.1	1.5	.21	.09	2.0	8.8	3.5	1.0	.52	.58	.91
AC-FT	63	258	184	38	117	5250	2570	663	230	62	69	92

WTR YR 1985 TOTAL 5124.96 MEAN 14.0 MAX 606 MIN .09 AC-FT 10170

## BIG SIOUX RIVER BASIN

06481500 SKUNK CREEK AT SIOUX FALLS, SD

LOCATION.--Lat 43°32'01", long 96°47'26", in NW¼SW¼ sec.24, T.101 N., R.50 W., Minnehaha County, Hydrologic Unit 10170203, on right bank 5 ft downstream from bridge on Marion Road, 1.3 mi upstream from mouth, 1.8 mi downstream from small right-bank tributary, and 4.0 mi southwest of Sioux Falls.

DRAINAGE AREA.--622 mi<sup>2</sup>, approximately, of which about 8.51 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD --May 1948 to current year. May 1948 to September 1971 (published as "near Sioux Falls").

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,405.10 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Oct. 24, 1949, nonrecording gage, and Oct. 24, 1949, to Apr. 28, 1972, water-stage recorder, both at site 1.9 mi upstream at datum 10.19 ft higher.

REMARKS.--Records good except those for winter period, Jan. 10 to Mar. 12, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--37 years, 63.4 ft<sup>3</sup>/s (45,930 acre-ft/yr); median of yearly mean discharges, 32 ft<sup>3</sup>/s (23,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,400 ft<sup>3</sup>/s June 17, 1957 (gage height, 17.78 ft), site and datum then in use, from rating curve extended above 8,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in many years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 16	1115	2,690	8.76	Apr. 23	0100	*3,750	*10.00
Apr. 5	0030	1,100	6.02				

Minimum daily discharge, 5.1 ft<sup>3</sup>/s Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	61	26	10	7.0	40	376	312	165	23	9.1	12
2	17	44	25	9.5	7.0	20	382	272	193	21	7.7	11
3	17	52	25	9.4	7.0	15	353	240	160	18	7.0	11
4	16	59	25	9.7	6.5	15	665	214	134	16	6.7	11
5	16	62	25	10	6.5	15	873	200	118	15	6.4	20
6	18	54	21	9.8	6.5	10	611	190	105	13	5.9	16
7	20	52	22	9.7	6.0	15	467	172	94	12	5.6	13
8	21	49	23	9.4	6.0	15	392	154	85	11	5.4	11
9	24	48	25	9.4	6.0	20	354	139	76	9.9	5.2	10
10	25	45	26	9.0	6.0	50	329	129	70	9.4	5.7	10
11	22	32	28	9.0	6.0	200	311	128	73	8.9	5.1	10
12	24	36	29	9.0	6.5	850	289	118	69	8.6	14	13
13	25	40	27	9.0	6.5	768	274	109	64	8.8	14	29
14	28	46	26	9.0	7.0	974	270	125	58	11	16	43
15	43	43	25	9.0	7.5	1470	260	197	54	11	13	45
16	70	28	25	9.0	8.0	1750	244	221	50	9.6	11	40
17	71	32	25	8.5	10	1530	224	188	44	8.8	12	31
18	79	34	25	8.5	15	1280	206	153	40	8.0	10	24
19	228	29	23	8.5	20	1280	196	131	37	7.3	8.4	19
20	260	28	22	8.0	30	1010	202	118	34	7.1	8.0	17
21	198	28	20	8.0	35	843	299	106	31	6.8	6.7	14
22	152	36	18	8.0	30	712	939	96	27	6.5	6.6	14
23	129	34	18	8.0	30	658	3060	90	25	6.1	12	17
24	113	34	16	8.0	35	609	1620	84	22	21	7.6	17
25	103	35	15	8.0	70	550	857	78	21	27	7.5	16
26	98	34	15	8.0	50	511	649	72	32	19	6.9	18
27	93	30	14	8.0	40	489	589	68	33	16	6.4	17
28	84	27	14	8.0	30	469	491	62	33	11	22	16
29	78	27	14	8.0	---	444	407	121	31	9.3	25	17
30	74	26	13	8.0	---	412	350	155	27	8.7	16	19
31	69	---	12	7.5	---	375	---	145	---	9.4	14	---
TOTAL	2232	1185	667	270.9	501.0	17399	16539	4587	2005	378.2	306.9	561
MEAN	72.0	39.5	21.5	8.74	17.9	561	551	148	66.8	12.2	9.90	18.7
MAX	260	62	29	10	70	1750	3060	312	193	27	25	45
MIN	16	26	12	7.5	6.0	10	196	62	21	6.1	5.1	10
AC-FT	443	2350	1320	537	994	34510	32810	9100	3980	750	609	1110
CAL YR 1984	TOTAL	149774	MEAN	409	MAX	7570	MIN	12	AC-FT	297100		
WTR YR 1985	TOTAL	46632.0	MEAN	128	MAX	3060	MIN	5.1	AC-FT	92490		



## 06482020 BIG SIOUX RIVER AT NORTH CLIFF AVENUE, AT SIOUX FALLS, SD

LOCATION.--Lat 43°34'01", long 96°42'39", in SW¼NW¼ sec.10, T.101 N., R.49 W., Minnehaha County, Hydrologic Unit 10170203, on right bank 20 ft downstream from bridge on North Cliff Avenue and 4.1 mi upstream from Slip Up Creek.

DRAINAGE AREA.--5,216 mi<sup>2</sup>, approximately, of which about 1,487 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--March 1962 to September 1971 (gage heights and discharge measurements only in files of U.S. Army Corps of Engineers). October 1971 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,294.18 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Dec. 15, 1971, nonrecording gage 20 ft upstream at same datum.

REMARKS.--Records good except those for period of no gage-height record, Oct. 1-16, which are poor. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--14 years, 468 ft<sup>3</sup>/s (339,100 acre-ft/yr); median of yearly mean discharges, 310 ft<sup>3</sup>/s (225,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,600 ft<sup>3</sup>/s June 22, 1984 (gage height, 25.40 ft); minimum daily discharge, 0.81 ft<sup>3</sup>/s Feb. 13, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 10, 1969, reached a stage of 27.45 ft, discharge, 40,700 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 25	1400	2,290	11.98	Apr. 23	2100	6,510	17.09
Mar. 22	1315	*8,230	*18.67	June 1	1915	2,140	11.28
Apr. 4	1330	3,750	13.94	Sept. 19	0015	1,020	8.62

Minimum daily discharge, 71 ft<sup>3</sup>/s Feb. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	220	968	440	194	90	795	2980	2340	2030	319	213	210
2	210	894	374	190	87	685	2850	2100	2060	303	202	212
3	200	850	223	166	85	568	2690	1920	1720	289	198	212
4	190	810	223	159	83	401	3310	1780	1490	283	198	212
5	180	779	225	140	84	342	3260	1660	1360	266	185	283
6	180	754	248	149	83	294	2800	1570	1190	253	179	335
7	190	735	290	150	80	292	2490	1460	1030	246	172	679
8	200	713	349	144	76	288	2270	1350	907	243	167	933
9	200	695	384	138	74	348	2130	1270	804	233	179	815
10	250	662	374	132	72	462	2020	1190	731	223	182	765
11	270	628	370	117	71	892	1930	1180	704	218	169	729
12	290	606	345	128	71	1730	1850	1070	633	214	250	746
13	300	606	309	130	72	2340	1770	1010	593	228	202	858
14	300	576	317	127	76	2970	1730	1090	563	238	189	832
15	300	563	339	122	77	4370	1680	1150	540	223	207	909
16	350	533	420	115	81	6100	1630	1210	521	210	232	987
17	463	542	350	110	85	5900	1590	1220	488	206	265	1010
18	717	530	314	105	92	6310	1550	1220	430	205	255	1010
19	1170	475	337	100	99	5960	1510	1190	397	199	244	1010
20	1410	426	327	100	114	6420	1500	1120	412	195	232	988
21	1550	401	325	95	221	7610	1600	1010	381	192	218	938
22	1700	452	316	93	299	8080	2530	933	352	192	209	880
23	1890	487	283	100	480	7780	5790	877	342	191	260	832
24	2140	491	306	108	534	6700	5800	827	325	273	214	748
25	2250	493	297	106	525	5750	4760	771	320	279	197	712
26	2100	518	229	103	500	5150	3870	720	473	256	195	675
27	1740	506	219	103	610	4660	3570	681	368	231	190	646
28	1400	473	227	100	773	4200	3270	636	330	230	341	628
29	1230	433	214	100	---	3810	2940	820	327	231	252	616
30	1120	444	203	98	---	3440	2630	874	328	231	220	594
31	1030	---	205	91	---	3190	---	1090	---	228	210	---
TOTAL	25740	18043	9382	3813	5594	107837	80300	37339	22149	7328	6626	21004
MEAN	830	601	303	123	200	3479	2677	1204	738	236	214	700
MAX	2250	968	440	194	773	8080	5800	2340	2060	319	341	1010
MIN	180	401	203	91	71	288	1500	636	320	191	167	210
AC-FT	5106	35790	18610	7560	11100	213900	159300	74060	43930	14540	13140	41660
CAL YR 1984	TOTAL	587170		MEAN	1604	MAX	20700	MIN	65	AC-FT	1165000	
WTR YR 1985	TOTAL	345155		MEAN	946	MAX	8080	MIN	71	AC-FT	684600	

## BIG SIOUX RIVER BASIN

06482610 SPLIT ROCK CREEK AT CORSON, SD

LOCATION.--Lat 43°36'59", long 96°33'54", in NE¼NW¼ sec.26, T.102 N., R.48 W., Minnehaha County, Hydrologic Unit 10170203, on left bank 6 ft downstream from highway bridge, 0.3 mi east of Corson, and 3.4 mi upstream from mouth.

DRAINAGE AREA.--464 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1965 to current year. February 1951 to September 1965 (gage heights and discharge measurements only in files of U.S. Army Corps of Engineers).

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,304.22 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Aug. 15, 1964, nonrecording gage at datum 0.15 ft higher and Aug. 15, 1964, to Sept. 3, 1970, nonrecording gage at present site and datum.

REMARKS.--Records good except those for winter period, Dec. 3 to Mar. 16, which are poor. Several observations of water temperature and specific conductance were made during the year.

AVERAGE DISCHARGE.--20 years, 94.2 ft<sup>3</sup>/s (68,250 acre-ft/yr); median of yearly mean discharges, 54 ft<sup>3</sup>/s (39,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,800 ft<sup>3</sup>/s Apr. 8, 1969 (gage height, 15.00 ft); no flow at times some years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1951, 15.41 ft June 17, 1957, discharge, 19,300 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 13	2300	3,100	a8.70	Apr. 22	1915	*4,100	*9.72

a Backwater from ice.

Minimum daily discharge, 7.8 ft<sup>3</sup>/s Aug. 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	87	59	25	10	70	99	211	282	74	25	39
2	28	80	55	23	10	60	97	182	286	67	23	40
3	28	75	50	23	10	50	93	158	278	59	20	38
4	26	81	50	25	10	50	165	139	253	54	15	37
5	26	82	51	24	10	60	225	131	200	48	13	51
6	31	78	45	20	10	60	175	123	147	41	11	62
7	45	76	51	18	10	60	138	114	126	39	8.7	54
8	56	76	51	16	10	60	121	106	112	37	7.8	71
9	52	71	51	18	10	90	110	97	95	31	11	103
10	53	68	51	18	11	250	102	90	84	30	11	142
11	54	67	52	17	12	900	97	92	83	26	10	134
12	52	63	53	16	13	1200	97	87	81	25	28	105
13	51	63	44	15	13	2000	99	80	75	24	46	134
14	48	70	45	15	13	2100	100	96	70	29	48	167
15	87	68	44	15	13	1300	100	177	65	31	43	148
16	133	60	60	15	13	1220	99	174	62	30	46	143
17	117	57	60	15	13	791	96	159	57	27	50	140
18	125	59	50	15	15	598	95	167	53	25	45	126
19	388	57	50	15	20	429	93	167	51	22	40	107
20	319	63	50	15	50	315	95	151	47	17	40	94
21	224	53	50	15	40	330	120	128	42	16	42	83
22	207	57	37	15	30	245	1030	109	41	14	39	79
23	200	62	34	15	50	156	2490	95	40	13	44	88
24	174	60	25	15	100	145	1910	87	37	49	41	87
25	145	64	30	15	150	132	1360	83	35	62	36	84
26	129	65	29	15	125	124	762	78	61	45	32	80
27	120	63	26	15	100	129	518	91	98	33	32	78
28	112	64	45	15	85	125	375	181	98	31	43	77
29	103	54	45	14	---	121	299	321	87	32	54	81
30	98	59	35	13	---	108	250	303	81	30	47	87
31	90	---	30	12	---	103	---	316	---	29	42	---
TOTAL	3349	2002	1408	522	956	13381	11410	4493	3127	1090	993.5	2759
MEAN	108	66.7	45.4	16.8	34.1	432	380	145	104	35.2	32.0	92.0
MAX	388	87	60	25	150	2100	2490	321	286	74	54	167
MIN	26	53	25	12	10	50	93	78	35	13	7.8	37
AC-FT	664	3970	2790	1040	1900	26540	22630	8910	6200	2160	1970	5470
CAL YR 1984	TOTAL	130850		MEAN	358	MAX	7320	MIN	18	AC-FT	259500	
WTR YR 1985	TOTAL	45490.5		MEAN	125	MAX	2490	MIN	7.8	AC-FT	90230	

## BIG SIOUX RIVER BASIN

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06482848 BEAVER CREEK AT CANTON, SD

LOCATION.--Lat 43°17'12", long 96°35'46", in SW¼SW¼SE¼ sec.23, T.98 N., R.49 W., Lincoln County, Hydrologic Unit 10170203, on left bank about 1,000 ft downstream from county highway bridge, 1.0 mi southwest of Canton, and 2.2 mi upstream from mouth.

DRAINAGE AREA.--124 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1982 to current year.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 1,225 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for missing record period, Oct. 17 to Nov. 14, and those for winter period, Nov. 29 to Mar. 9, which are poor. Several observations of water temperature and specific conductance were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,570 ft<sup>3</sup>/s June 17, 1984 (gage height, 13.72 ft); maximum gage height, 14.61 ft June 20, 1983; minimum daily discharge, 1.7 ft<sup>3</sup>/s Feb. 5, 6, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 10	0200	364	5.85	May 31	0300	327	5.40
Apr. 24	0930	*603	*7.24				

Minimum daily discharge, 1.7 ft<sup>3</sup>/s Feb. 5, 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	9.0	8.2	4.0	2.0	17	17	79	47	8.7	4.0	6.8
2	6.6	9.0	8.5	4.0	1.9	15	18	55	27	7.2	3.3	6.6
3	6.4	9.0	9.0	4.5	1.8	12	18	42	20	6.5	4.5	6.4
4	6.4	9.0	10	5.0	1.7	11	22	31	17	5.5	5.0	6.0
5	6.6	9.0	10	7.0	1.7	10	25	26	14	4.4	4.1	26
6	8.6	9.0	11	6.0	1.8	15	39	23	12	4.9	3.6	14
7	9.9	9.0	12	5.0	1.8	30	30	19	10	4.7	3.2	10
8	10	9.0	10	5.0	1.9	100	22	16	8.9	3.9	3.1	8.7
9	9.5	13	8.5	5.0	2.0	200	20	15	7.3	4.3	2.8	8.4
10	8.9	12	7.8	5.0	2.1	272	20	13	7.2	4.1	2.7	8.2
11	8.0	11	7.9	5.0	2.2	267	18	14	9.0	3.8	2.8	7.2
12	8.8	10	8.6	6.0	2.3	260	17	14	8.1	3.6	18	8.3
13	8.3	9.0	8.5	5.5	2.4	238	16	15	7.0	3.6	16	20
14	8.1	9.0	8.0	5.0	2.4	210	15	22	6.4	4.5	6.7	26
15	19	8.3	8.0	5.0	2.4	153	14	32	5.9	5.2	5.4	20
16	12	7.4	8.0	5.0	2.6	106	13	35	5.5	4.1	5.3	19
17	11	9.1	7.0	4.8	2.6	75	11	31	5.5	3.9	9.2	19
18	10	8.7	7.0	4.5	2.7	52	11	24	5.1	3.9	7.3	17
19	9.0	7.9	7.0	4.5	2.7	40	11	19	4.9	3.8	5.3	14
20	15	7.7	7.0	4.0	2.8	31	11	16	4.8	3.3	4.9	12
21	10	12	7.0	4.0	3.5	25	12	17	4.8	3.5	4.9	11
22	10	8.8	7.0	4.0	4.0	22	48	19	4.3	3.7	4.9	11
23	10	8.3	7.0	4.0	4.5	21	260	14	4.1	3.6	10	15
24	10	8.3	6.0	4.0	5.0	21	550	12	3.9	3.4	9.0	15
25	10	8.5	6.0	4.0	7.0	20	336	10	4.1	3.6	6.2	15
26	10	8.5	6.0	3.5	8.0	20	184	9.6	27	3.5	5.7	13
27	10	8.2	6.0	3.5	10	20	128	8.7	33	3.1	5.4	13
28	10	7.0	6.0	3.5	20	20	103	7.1	22	3.1	6.1	11
29	10	7.4	5.0	3.5	---	19	76	14	17	2.8	11	13
30	10	8.0	4.5	3.5	---	18	60	45	12	3.1	9.7	15
31	10	---	4.0	2.5	---	18	---	170	---	3.9	7.4	---
TOTAL	298.8	270.1	236.5	139.8	105.8	2338	2125	867.4	364.8	131.2	197.5	395.6
MEAN	9.64	9.00	7.63	4.51	3.78	75.4	70.8	28.0	12.2	4.23	6.37	13.2
MAX	19	13	12	7.0	20	272	550	170	47	8.7	18	26
MIN	6.4	7.0	4.0	2.5	1.7	10	11	7.1	3.9	2.8	2.7	6.0
AC-FT	59	536	469	277	210	4640	4210	1720	724	260	392	785
CAL YR 1984	TOTAL	37144.8		MEAN	101	MAX	2280	MIN	4.0	AC-FT	73680	
WTR YR 1985	TOTAL	7470.5		MEAN	20.5	MAX	550	MIN	1.7	AC-FT	14820	

## BIG SIOUX RIVER BASIN

06485500 BIG SIOUX RIVER AT AKRON, IA  
(National stream-quality accounting network station)

LOCATION.--Lat 42°49'42", long 96°33'45", in NW¼SW¼ sec.31, T.93 N., R.48 W., Plymouth County, Hydrologic Unit 10170203, on left bank at west edge of Akron, 0.6 mi downstream from bridge on State Highway 48, and 2.3 mi upstream from Union Creek.

DRAINAGE AREA.--8,424 mi<sup>2</sup>, approximately, of which about 1,487 mi<sup>2</sup> is probably noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1928 to current year.

REVISED RECORDS.--WSP 1309: 1929(M), 1931-33(M), 1936(M), 1938(M), 1940(M). WSP 1389: Drainage area. WDR SD-84-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,118.90 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 3, 1934, nonrecording gage at bridge 300 ft upstream at same datum.

REMARKS.--Records good except those for winter period, Dec. 13 to Mar. 8, which are poor, and May 30 to July 17, which are fair. U.S. Army Corps of Engineers satellite data-collection platform at station.

AVERAGE DISCHARGE.--57 years, 982 ft<sup>3</sup>/s (711,500 acre-ft/yr); median of yearly mean discharges, 750 ft<sup>3</sup>/s (543,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,800 ft<sup>3</sup>/s Apr. 9, 1969 (gage height, 22.99 ft); minimum daily, 4.0 ft<sup>3</sup>/s Jan. 17, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 14	0800	10,100	17.03	June 1	1900	5,180	14.13
Apr. 6	1800	5,400	14.48	Aug. 29	1100	4,120	12.98
Apr. 26	0630	*21,000	*20.29	Sept. 7	1845	3,880	12.71
May 18	1400	3,720	12.56				

Minimum daily discharge, 290 ft<sup>3</sup>/s Feb. 6-17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	620	2090	1090	1100	330	1400	4310	6480	4850	2210	701	1310
2	640	1940	1070	1000	320	1500	3890	5910	5050	1930	689	1150
3	660	1850	963	960	310	1600	3670	5120	4680	1740	677	1050
4	652	1770	672	900	310	1700	3590	4440	3870	1580	671	983
5	646	1700	700	800	300	1300	3700	3920	3370	1450	652	1090
6	669	1650	699	760	290	1200	4830	3530	3110	1340	631	2410
7	714	1600	903	730	290	1200	4830	3310	2910	1230	610	3640
8	733	1550	983	700	290	1400	4560	3150	2700	1140	589	3140
9	764	1530	955	650	290	2460	3800	3000	2490	1070	569	2630
10	751	1520	996	620	290	3080	3380	2870	2300	996	558	2490
11	774	1470	1020	600	290	3540	3180	2770	2180	927	550	2300
12	792	1410	1040	570	290	4640	3060	2740	2110	869	591	2140
13	815	1360	1050	540	290	8480	2950	2870	2040	828	680	2310
14	869	1330	1040	520	290	9810	2880	2820	1910	793	776	2480
15	958	1320	1020	500	290	8290	2820	2900	1810	769	833	2760
16	1050	1300	1000	490	290	7860	2770	3230	1730	766	798	2960
17	1560	1250	1100	480	290	7640	2710	3530	1660	752	766	2850
18	2170	1210	1200	470	295	8240	2660	3700	1580	728	765	2710
19	2270	1190	1300	470	300	8670	2600	3540	1510	756	780	2610
20	2480	1160	1300	460	330	7960	2580	3430	1430	764	767	2510
21	3120	1080	1300	450	360	7660	2580	3200	1360	745	735	2390
22	3300	999	1300	440	400	7220	4780	3020	1310	719	708	2310
23	3140	1060	1300	440	490	7740	7190	2860	1250	698	699	2300
24	3080	1090	1300	440	600	8800	9630	2700	1170	686	702	2320
25	3150	1130	1270	430	750	9090	16200	2600	1100	681	765	2330
26	3270	1140	1250	420	1100	8570	18800	2520	1170	695	800	2280
27	3350	1140	1200	410	1500	7440	13700	2390	1490	764	716	2180
28	3190	1150	1170	390	1400	6370	10100	2260	2100	768	679	2070
29	2820	1150	1150	370	---	5870	8500	2190	2450	735	2520	2000
30	2470	1110	1150	350	---	5340	7340	2370	2480	701	1460	2010
31	2240	---	1150	340	---	4820	---	3250	---	702	1530	---
TOTAL	53717	41249	33641	17800	12575	170890	167590	102620	69170	30532	24967	67713
MEAN	1733	1375	1085	574	449	5513	5586	3310	2306	985	805	2257
MAX	3350	2090	1300	1100	1500	9810	18800	6480	5050	2210	2520	3640
MIN	620	999	672	340	290	1200	2580	2190	1100	681	550	983
AC-FT	10650	81820	66730	35310	24940	339000	332400	203500	137200	60560	49520	134300
CAL YR 1984	TOTAL	1631900		MEAN	4459	MAX	49000	MIN	440	AC-FT	3237000	
WTR YR 1985	TOTAL	792464		MEAN	2171	MAX	18800	MIN	290	AC-FT	1572000	



## BIG SIOUX RIVER BASIN

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06485500 BIG SIOUX RIVER AT AKRON, IA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1966 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to September 1981.

WATER TEMPERATURE: October 1974 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,310 microsiemens, Jan. 20, 1977; minimum daily, 260 microsiemens, Mar. 20, 23, 1978.

WATER TEMPERATURE: Maximum daily, 31.0°C, Feb. 19, 1975, July 23, 1976, July 11, 1981; minimum daily, 0.0°C on many days during winter periods.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE, AIR (DEG C)	TEMPER- ATURE (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
NOV 1984												
15...	11:15	1320	1000	8.2	2.0	5.0	22	736	11.6	94	180	1400
FEB 1985												
12...	12:45	291	1190	7.4	-6.0	0.0	2.6	737	7.9	56	570	1200
MAY												
23...	10:15	2860	950	8.2	25.0	20.0	57	734	7.4	85	1100	1700
AUG												
14...	12:30	781	830	8.8	22.0	21.5	65	735	10.1	119	2700	700

DATE	HARD- NESS (MG/L AS CACO3)	HARD- NESS, NONCAR- BONATE (MG/L CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
NOV 1984												
15...	530	220	130	50	30	11	0.6	5.7	309	220	27	0.4
FEB 1985												
12...	560	230	140	51	50	16	1	6.7	334	250	60	0.4
MAY												
23...	510	220	120	50	25	10	0.5	5.5	282	190	22	0.4
AUG												
14...	380	150	83	41	39	18	0.9	7.4	227	190	46	0.3

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS TOTAL (MG/L AS PO4)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)
NOV 1984												
15...	19	714	670	0.97	2540	5.00	0.05	0.06	1.5	0.32	--	0.20
FEB 1985												
12...	21	794	780	1.1	624	7.20	0.28	0.36	1.4	0.57	--	0.54
MAY												
23...	14	589	600	0.8	4550	6.20	0.06	0.08	1.6	0.43	1.3	0.17
AUG												
14...	5.2	546	550	0.74	1150	1.50	0.03	0.04	3.4	0.90	2.8	0.03



## BIG SIOUX RIVER BASIN

06485500 BIG SIOUX RIVER AT AKRON, IA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 1984												
15...	0.19	<10	2	96	<0	<1	<1	<3	14	9	3	42
FEB 1985												
12...	0.50	<10	<1	94	<0.5	2	<1	<3	5	12	<1	42
MAY												
23...	0.12	<10	3	110	<0.5	1	<2	<3	8	7	2	39
AUG												
14...	0.03	<10	5	79	<0.5	<1	<1	<3	2	6	<1	35
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 1984												
15...	26	<0.1	<10	<1	3	<1	450	<6	24	130	463	88
FEB 1985												
12...	220	<0.1	<10	5	5	<1	510	<6	17	27	21	76
MAY												
23...	9	<0.1	<10	4	3	<1	420	<6	11	384	2970	95
AUG												
14...	40	<0.1	<10	4	3	<1	370	<6	11	616	1300	98

## BIG SIOUX RIVER BASIN

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06485696 BRULE CREEK NEAR ELK POINT, SD

LOCATION.--Lat 42°48'32", long 96°41'11", in SW¼SW¼ sec.6, T.92 N., R.49 W., Union County, Hydrologic Unit 10170203, on right bank 10 ft upstream from county highway bridge, 8.8 mi upstream from mouth, and 8.5 mi north of Elk Point.

DRAINAGE AREA.--204 mi<sup>2</sup>.

REVISED RECORDS.--WDR SD-84-1: Drainage area.

PERIOD OF RECORD.--October 1982 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,150 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for winter period, Dec. 12 to Mar. 12, which are poor. Several observations of specific conductance and water temperature were made during the year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,290 ft<sup>3</sup>/s June 28, 1983 (gage height, 22.39 ft); minimum daily discharge, 6.8 ft<sup>3</sup>/s Feb. 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 23	0815	*2,310	*15.91	June 27	0630	678	9.57
June 26	0815	544	8.81				

Minimum daily discharge, 6.8 ft<sup>3</sup>/s Feb. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	33	36	15	9.0	20	41	204	99	80	12	55
2	18	32	34	15	8.8	20	66	144	60	68	12	43
3	18	31	36	15	8.5	25	76	107	54	59	11	57
4	18	31	42	15	8.3	100	74	89	50	51	15	42
5	18	30	33	20	8.2	300	118	79	48	44	21	44
6	21	30	28	25	7.9	200	95	71	45	39	13	246
7	28	30	26	25	7.7	250	76	64	41	35	12	94
8	43	30	30	20	7.5	250	60	59	38	33	11	51
9	31	35	37	20	7.2	150	52	54	33	31	10	41
10	28	40	36	15	7.1	100	51	51	31	29	11	37
11	26	40	37	15	7.0	70	51	55	37	25	11	35
12	26	40	35	15	7.0	100	50	69	48	23	24	35
13	24	40	30	15	6.8	73	50	55	44	21	96	123
14	23	41	30	15	7.0	54	52	115	40	21	47	432
15	34	39	30	15	8.0	56	52	227	37	20	24	377
16	98	33	35	15	15	45	49	198	34	19	19	151
17	68	34	35	15	10	42	44	126	26	17	23	106
18	70	36	30	15	10	39	41	87	28	16	30	90
19	206	47	30	15	10	40	39	73	28	15	25	72
20	216	54	30	15	15	41	43	235	34	14	17	53
21	88	49	30	10	20	41	60	119	29	15	15	47
22	61	37	30	10	25	41	433	66	27	15	15	48
23	51	35	25	10	30	45	1770	61	23	14	25	80
24	46	35	25	10	26	55	955	58	22	13	26	167
25	45	37	25	10	25	44	364	52	25	12	26	96
26	44	36	25	10	23	44	317	48	390	12	18	68
27	45	34	25	10	22	86	431	44	595	11	16	58
28	43	29	30	10	21	69	259	44	378	11	20	50
29	39	35	25	10	---	54	187	71	153	10	82	51
30	37	36	20	9.5	---	45	165	267	103	10	190	89
31	35	---	20	9.2	---	43	---	210	---	11	118	---
TOTAL	1565	1089	940	443.7	368.0	2542	6121	3202	2600	794	995	2938
MEAN	50.5	36.3	30.3	14.3	13.1	82.0	204	103	86.7	25.6	32.1	97.9
MAX	216	54	42	25	30	300	1770	267	595	80	190	432
MIN	17	29	20	9.2	6.8	20	39	44	22	10	10	35
AC-FT	310	2160	1860	880	730	5040	12140	6350	5160	1570	1970	5830
CAL YR 1984	TOTAL	59888		MEAN	164	MAX	2080	MIN	15	AC-FT	118800	
WTR YR 1985	TOTAL	23597.7		MEAN	64.7	MAX	1770	MIN	6.8	AC-FT	468101	

## MISSOURI RIVER MAIN STEM

06486000 MISSOURI RIVER AT SIOUX CITY, IA  
(National stream-quality accounting network station)

LOCATION.--Lat 42°29'09", long 96°24'49", in NW¼SE¼ sec.16, T.29 N., R.9 E., sixth principal meridian, Dakota County, Nebraska, Hydrologic Unit 10230001, on right bank on upstream side of bridge on U.S. Highway 20 and 77 at South Sioux City, Nebraska, 1.9 mi downstream from Big Sioux River, and at mile 732.2.

DRAINAGE AREA.--314,600 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--October 1897 to current year in reports of Geological Survey. Prior to October 1928 and October 1931 to September 1938, monthly discharges only, published in WSP 1310. January 1879 to December 1890 (monthly discharges only) in House Document 238, 73rd Congress, 2d session, Missouri River. Gage-height records collected in this vicinity September 1878 to December 1899 are contained in reports of Missouri River Commission and since July 1889 are contained in reports of U.S. Weather Bureau.

REVISED RECORDS.--WSP 716: 1929-30. WSP 876: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,056.98 ft above National Geodetic Vertical Datum of 1929. Sept. 2, 1878, to Dec. 31, 1905, nonrecording gages at various locations within 1.7 mi of present site and at various datums. Jan. 1, 1906, to Feb. 14, 1935, nonrecording gage, and Feb. 15, 1935, to Sept. 30, 1969, water-stage recorder at site 227 ft downstream at datum 19.98 ft higher, and Oct. 1, 1969, to Sept. 30, 1970, at datum 20.00 ft higher. Oct. 1, 1970, to Jan. 30, 1981, water-stage recorder at site 227 ft downstream at present datum.

REMARKS.--Estimated daily discharges: Dec. 25, 30, Jan. 1, 2, 11, 12, 15, 16, 20-22, 25, Jan. 28 to Feb. 5 and Feb. 9, 10. Records good except for estimated daily discharges, which are poor. Flow regulated by upstream main-stem reservoirs. U.S. National Weather Service gage-height telemeter at station. U.S. Army Corps of Engineers rain-gage and gage-height satellite data-collection platform at station.

AVERAGE DISCHARGE.--88 years, 32,050 ft<sup>3</sup>/s (23,220,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 441,000 ft<sup>3</sup>/s Apr. 14, 1952 (gage height, 24.28 ft), datum then in use; minimum, 2,500 ft<sup>3</sup>/s Dec. 29, 1941; minimum gage height, 9.00 ft Jan. 8, 1980, based on gage readings at site 14 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharges, 56,600 ft<sup>3</sup>/s Apr. 23 (gage height, 23.94 ft); minimum daily discharge, 17,000 ft<sup>3</sup>/s Jan. 31; minimum gage height not determined, occurred during period of no gage-height record Jan. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46200	48700	45800	19600	18600	23200	32800	32100	33600	35000	32900	31900
2	46400	48000	44000	19000	20300	23300	32800	31800	35700	34500	32700	32900
3	46100	47800	40500	20600	20600	24000	33000	31800	36100	33900	33000	33000
4	45600	47800	36700	21900	20400	27900	33800	31200	35300	33700	32600	32600
5	46000	47800	33800	21700	20300	24400	33000	30800	33600	33300	32300	32800
6	46500	47800	31700	21200	20000	23400	32700	30800	32700	32500	32200	33000
7	47200	47700	31000	20800	20100	23900	32900	31400	34000	31700	32300	33500
8	46600	47600	29800	20700	20300	24300	33000	32400	34600	31000	32300	33000
9	46500	48000	27100	20600	20300	25200	32000	32800	34000	31200	32300	31400
10	46700	48200	26500	20800	20400	26800	31400	33300	33600	31200	32400	31800
11	46600	47300	26300	20500	19900	27800	31700	33100	33700	31500	32000	31800
12	46800	47000	26300	20300	20400	28900	31800	33500	33500	31600	33000	32000
13	46700	47100	24900	21100	20800	29200	31200	33100	33200	31800	32700	33700
14	46700	47500	25400	22200	20600	30200	30900	34400	33300	32000	32400	33600
15	47700	47600	26700	19800	20800	32200	30800	33400	33600	32200	32400	32200
16	47200	46900	27100	19900	21100	32200	30600	31800	33700	32400	32500	32900
17	46800	46500	25800	20900	21300	32100	30600	31100	33400	33500	33200	32800
18	47200	46400	24200	21500	21300	32400	30100	31300	32300	34300	32600	31600
19	49400	46300	25000	20500	21400	33000	30400	32500	32400	34500	32400	31900
20	49000	46300	24900	18500	21400	33700	30600	32200	32500	34000	32200	32200
21	48800	46200	24800	18400	22300	33600	31700	32200	32900	32400	32500	31900
22	49000	46100	22600	19700	22100	33500	37900	32100	33100	32000	32300	31800
23	48900	46000	21700	22000	22100	33500	49500	32100	32900	32200	32500	32100
24	49200	46300	21200	23500	22400	33300	43200	31900	32800	32500	32500	32000
25	49400	46500	19100	22900	23000	33600	30600	32600	33000	32700	32000	32000
26	49700	46600	21800	21900	23900	33900	31300	32700	35400	32600	31800	32000
27	50200	46300	22400	23500	23900	34600	33700	32400	39100	32600	31900	31800
28	50000	46000	23200	23500	23400	33600	31000	32100	36000	32600	31800	31800
29	49800	46000	21600	22600	---	33000	27400	32300	35500	32500	33400	32000
30	49300	46000	19500	23100	---	32600	26400	32700	35300	32600	34900	32200
31	48900	---	20700	17000	---	32800	---	33200	---	32800	31600	---
TOTAL	1481100	1410300	842100	650200	593400	926100	978800	1001100	1020800	1013300	1007600	970200
MEAN	47780	47010	27160	20970	21190	29870	32630	32290	34030	32690	32500	32340
MAX	50200	48700	45800	23500	23900	34600	49500	34400	39100	35000	34900	33700
MIN	45600	46000	19100	17000	18600	23200	26400	30800	32300	31000	31600	31400
AC-FT	2938000	2797000	1670000	1290000	1177000	1837000	1941000	1986000	2025000	2010000	1999000	1924000
CAL YR 1984	TOTAL 14184800			MEAN 38760	MAX 103000	MIN 16800	AC-FT28136000					
WTR YR 1985	TOTAL 11895000			MEAN 32590	MAX 50200	MIN 17000	AC-FT23594000					

## MISCELLANEOUS WATER QUALITY DATA

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The following water-quality data are for sewage lagoons and a reservoir at EROS Data Center, and private wells downgradient of EROS Data Center near Garretson, South Dakota. The water samples were collected by USGS personnel and analyzed by the USGS laboratory in Arvada, Colorado.

STATION NAME	STATION NUMBER	DATE	TEMPER- ATURE (DEG C)	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	PH LAB (STAND- ARD UNITS)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	CYANIDE TOTAL (MG/L AS CN)
LAGOON 1	434415096371501	05-08-85	17.0	1028	80020	2900	7.1	7.3	14.0	*0.4
LAGOON 2	434415096371502	05-08-85	18.5	1028	80020	2810	8.5	7.2	11.0	*0.15
LAGOON 3	434415096371501	05-08-85	19.0	1028	80020	2120	7.8	7.7	4.40	*0.02
LAGOON 4	434415096371504	05-08-85	21.0	1028	80020	2140	9.0	8.7	2.80	*0.02
EROS LAKE	434405096365501	05-08-85	19.0	1028	80020	1540	8.7	8.5	<0.10	<0.01
WELL 1	434508096372701	10-03-84	9.0	1028	80020	1140	7.6	7.3	0.62	<0.01
WELL 7	434400096362201	10-03-84	10.0	1028	80020	2310	7.3	7.3	94.0	*0.02
WELL 9	434332096371501	10-03-84	10.0	1028	80020	900	7.9	7.3	0.16	<0.01

STATION NUMBER	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SULFATE DIS- SOLVED (MG/L AS SO4)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	BORON, DIS- SOLVED (UG/L AS B)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)
434415096371501	60	47	420	58	600	240	1.1	14	1700	20
434415096371502	59	44	400	29	570	230	1.1	14	1500	10
434415096371501	60	42	300	22	400	320	0.9	<1.0	1100	10
434415096371504	59	38	300	24	400	330	0.9	3.7	1100	<10
434405096365501	59	39	190	19	260	190	0.6	0.4	880	<10
434508096372701	150	36	17	3.5	2.2	230	0.8	25	200	<10
434400096362201	200	110	48	3.9	110	150	0.6	25	70	<10
434332096371501	130	30	23	3.3	3.6	160	0.8	19	290	<10

STATION NUMBER	IRON, DIS- SOLVED (UG/L AS FE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	IODIDE, DIS- SOLVED (MG/L AS I)	BROMIDE DIS- SOLVED (MG/L AS BR)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	ELEV. OF LAND SURFACE DATUM (FT. ABOVE NGVD)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	ALKA- LITY LAB (MG/L AS CaCO3)
434415096371501	710	3	80	70	0.095	9.0	0.3	--	2960	8.0
434415096371502	150	2	80	30	0.09	9.0	<0.1	--	2830	8.0
434415096371501	50	<1	20	<10	0.066	6.6	<0.1	--	2110	91
434415096371504	50	<1	20	20	0.089	6.6	0.3	--	2120	85
434405096365501	29	<1	17	<10	0.082	4.3	<0.1	--	1540	190
434508096372701	60	<1	2600	30	0.001	<0.01	0.6	1590	850	313
434400096362201	50	<1	140	<10	<0.001	0.15	<0.1	1520	1640	347
434332096371501	160	<1	20	<10	<0.001	<0.01	<0.1	1560	2220	342

\*Concentration is at or above alert limit of 0.02 mg/L.

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06354860 - SPRING CR NEAR HERREID SD (LAT 45 48 52 LONG 100 06 28)					
MAR 1985					
12...	1515	7.4	.0	.0	770
26...	1645	9.0	4.0	4.5	405
MAY					
01...	1545	.05	26.0	--	--
06354882 - OAK CR NEAR WAKPALA SD (LAT 45 42 43 LONG 100 33 32)					
NOV 1984					
07...	1330	.70	2.5	12.5	1380
DEC					
05...	0830	.34	.0	-16.0	--
JAN 1985					
10...	0815	.60	.0	-22.0	1040
MAR					
13...	0800	1.3	.0	.0	760
26...	1400	23	--	6.5	380
MAY					
02...	0815	3.2	16.0	17.5	790
29...	1215	.08	23.0	25.0	1100
06355500 - NORTH FORK GRAND R NEAR WHITE BUTTE SD (LAT 45 48 10 LONG 102 21 45)					
OCT 1984					
11...	1400	14	19.0	--	4900
NOV					
08...	1630	4.9	2.5	--	3280
DEC					
05...	1515	2.4	.0	--	--
JAN 1985					
10...	1515	3.3	.0	--	3700
MAR					
13...	1445	3.6	.0	--	--
20...	0730	222	1.0	--	--
27...	1230	132	3.0	--	1440
MAY					
02...	1545	21	18.0	--	2580
30...	1215	9.6	18.0	--	3200
JUN					
27...	1615	1.9	18.0	--	3350
SEP					
26...	1215	1.3	8.0	--	2890
06356500 - SOUTH FORK GRAND R NEAR CASH SD (LAT 45 38 56 LONG 102 38 27)					
OCT 1984					
11...	1230	19	17.0	24.0	1380
NOV					
08...	1500	17	2.5	10.5	2180
DEC					
05...	1345	6.3	.0	-15.0	--
JAN 1985					
10...	1315	--	.0	-4.0	--
FEB					
06...	1445	.61	.0	-17.0	--
MAR					
19...	1630	1380	1.0	6.0	--
27...	1030	58	3.5	.0	1060
MAY					
02...	1415	17	17.0	29.0	2250
30...	1030	107	18.0	18.5	1300
JUN					
27...	1445	31	17.5	16.5	1480
JUL					
24...	1045	5.2	23.0	27.0	1040
AUG					
21...	1230	13	23.0	28.0	--
SEP					
26...	1100	13	5.5	13.5	2250



## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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06357500 - GRAND R AT SHADEHILL SD (LAT 45 45 25 LONG 102 11 41)

OCT 1984					
11...	1515	19	--	24.0	2700
NOV					
09...	0745	14	3.0	-3.0	1930
DEC					
05...	1615	16	.0	-16.0	--
JAN 1985					
10...	1630	15	.0	-20.5	2000
FEB					
07...	0915	13	.0	-23.0	--
MAR					
14...	0700	13	--	-1.0	2200
27...	1400	110	3.0	2.5	1730
MAY					
03...	0700	45	14.0	15.0	1580
30...	1345	31	18.0	15.0	1700
JUN					
28...	0715	51	15.0	10.5	1750
JUL					
24...	1245	44	25.0	29.0	1740
AUG					
21...	1630	45	29.0	23.0	1800
SEP					
26...	1400	32	15.5	18.5	2250

06359500 - MOREAU R NEAR FAITH SD (LAT 45 11 52 LONG 102 09 22)

OCT 1984					
12...	0800	14	15.0	18.0	2000
NOV					
09...	0945	11	1.5	-2.0	2000
DEC					
06...	0815	4.9	.0	-12.0	--
JAN 1985					
11...	0915	.00	--	-5.0	--
MAR					
14...	0900	65	--	.0	1400
19...	1330	3320	.0	5.5	--
22...	1045	2750	.0	-1.0	--
27...	0830	338	3.5	.0	861
MAY					
03...	0830	19	16.5	16.0	2050
30...	1615	102	15.0	15.0	1900
JUN					
28...	0900	8.5	14.5	11.0	2070
JUL					
24...	1400	.02	29.0	30.0	--
AUG					
22...	0745	21	20.0	19.0	1660
SEP					
26...	1615	2.8	16.5	21.0	2950

06439000 - CHERRY CR NEAR PLAINVIEW SD (LAT 44 44 38 LONG 102 03 11)

DEC 1984					
06...	0915	.00	--	-10.0	--
JAN 1985					
11...	0945	.00	--	-3.0	--
MAR					
28...	0615	118	2.5	-.5	1080
MAY					
03...	0945	3.4	17.0	17.0	2400

MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS  
WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06441500 - BAD R NEAR FORT PIERRE SD (LAT 44 19 36 LONG 100 23 02)					
FEB 1985					
22...	0915	224	.0	2.0	--
MAR					
01...	1400	--	1.0	--	--
06...	0845	--	--	.0	--
15...	1015	946	1.0	7.0	--
15...	1015	--	1.0	--	--
25...	1330	107	7.5	22.0	--
APR					
23...	1500	2.1	18.5	19.0	3950
MAY					
10...	1415	--	25.0	--	--
17...	1545	--	27.0	28.0	--
JUN					
04...	1330	--	17.0	22.0	--
21...	1445	--	--	21.0	--
24...	1430	--	--	34.5	--
28...	1430	--	21.0	20.0	--
JUL					
24...	1430	--	22.5	28.0	--

06442000 - MEDICINE KNOLL CR NEAR BLUNT SD (LAT 44 33 46 LONG 099 54 50)

NOV 1984					
28...	1245	.14	--	--	1400

06442500 - MEDICINE CR AT KENNEBEC SD (LAT 43 54 17 LONG 099 52 35)

MAR 1985					
20...	1600	299	6.0	16.0	471
JUN					
14...	1415	.62	20.5	23.0	1550
SEP					
13...	1645	2.4	20.0	20.0	--

06447000 - WHITE R NEAR KADOKA SD (LAT 43 45 09 LONG 101 31 28)

OCT 1984					
03...	1030	2.1	16.0	17.5	850
30...	1100	12	2.5	4.5	850
NOV					
19...	1115	11	.5	-3.0	740
JAN 1985					
21...	1145	9.9	.0	-8.0	610
FEB					
19...	1115	24	.0	3.5	600
MAR					
18...	1145	634	4.0	18.0	390
APR					
17...	1045	47	21.0	27.5	680
MAY					
14...	1015	13	--	15.0	750
JUN					
12...	1045	335	18.0	21.5	610
JUL					
09...	1100	2.6	26.0	29.0	740
SEP					
11...	1115	175	17.0	19.0	435

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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06447500 - LITTLE WHITE R NEAR MARTIN SD (LAT 43 10 00 LONG 101 37 47)

OCT 1984					
03...	1545	9.8	12.5	23.0	215
30...	1345	12	4.0	4.5	260
NOV					
19...	1615	21	.5	-5.0	248
JAN 1985					
04...	0845	6.7	.0	-2.5	370
21...	1600	9.2	.0	-9.0	220
FEB					
19...	1430	7.9	.0	4.5	193
MAR					
18...	1645	64	1.0	13.0	175
APR					
17...	1430	21	18.0	29.0	435
MAY					
14...	1530	12	15.0	17.5	310
JUN					
13...	0745	7.7	17.5	15.0	280
JUL					
09...	1630	17	28.0	33.0	379
AUG					
08...	0715	5.4	23.0	19.5	--
SEP					
12...	0715	12	17.5	17.0	--

06449000 - LAKE CR BELOW REFUGE NEAR TUTHILL SD (LAT 43 08 46 LONG 101 30 38)

OCT 1984					
03...	1415	.83	16.5	20.5	620
30...	1245	1.6	4.0	6.0	730
NOV					
19...	1300	.06	4.5	-2.5	715
JAN 1985					
03...	1415	27	1.5	.5	650
21...	1345	12	.5	-8.0	600
FEB					
19...	1315	8.9	.5	4.5	630
MAR					
18...	1530	18	5.0	16.0	367
APR					
17...	1245	28	18.5	29.0	395
MAY					
14...	1415	13	15.0	17.0	410
JUN					
12...	1245	.00	22.0	21.5	510
JUL					
09...	1500	2.6	31.0	37.0	550
AUG					
08...	0745	.25	--	25.0	--
SEP					
11...	1615	8.6	18.0	19.0	635

MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS  
 WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06449400 - ROSEBUD CR AT ROSEBUD SD (LAT 43 14 09 LONG 100 51 12)					
OCT 1984					
04...	1045	6.8	12.0	23.0	340
31...	1130	7.3	5.0	8.0	410
NOV					
20...	1100	9.1	2.0	6.0	340
JAN 1985					
04...	1145	6.2	.0	.5	340
22...	1445	7.4	.0	-1.5	380
FEB					
20...	1000	16	.0	3.5	210
MAR					
19...	1015	8.4	7.0	15.0	325
APR					
18...	1230	7.4	26.0	30.0	360
MAY					
15...	1000	6.5	14.0	12.0	350
JUN					
13...	1200	5.9	18.0	21.0	330
JUL					
10...	1000	3.8	24.0	31.0	318
AUG					
08...	1200	4.3	25.0	31.5	302
SEP					
12...	1230	7.4	18.0	17.5	345

06450500 - LITTLE WHITE R BELOW WHITE RIVER SD (LAT 43 36 04 LONG 100 44 52)

OCT 1984					
04...	1500	59	19.0	25.0	310
31...	1345	76	7.5	11.5	440
NOV					
20...	1400	98	1.5	10.0	309
JAN 1985					
07...	1445	51	.0	1.5	360
23...	1315	60	.0	2.5	310
FEB					
20...	1400	--	--	15.0	--
MAR					
19...	1415	228	9.0	18.5	361
APR					
18...	1530	115	20.0	31.5	360
MAY					
15...	1330	86	17.5	19.0	360
JUN					
18...	0845	43	18.5	19.0	--
JUL					
10...	1315	65	28.0	40.0	328
AUG					
08...	1445	66	28.5	38.0	304
SEP					
12...	1545	66	22.0	23.0	285

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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## 06453255 - CHOTEAU CR NR AVON SD (LAT 42 55 24 LONG 098 06 21)

OCT 1984					
19...	0940	20	6.0	6.5	1730
NOV					
16...	0910	6.4	3.0	6.5	1800
DEC					
06...	1230	6.8	1.0	2.0	2150
JAN 1985					
11...	0920	5.1	0.5	-20.0	1900
FEB					
22...	0905	17	0.5	2.5	1110
MAR					
14...	0855	271	2.5	2.0	900
22...	1620	93	10.0	8.0	900
APR					
19...	0925	12	18.0	25.0	1530
MAY					
16...	1105	40	13.0	17.5	1690
JUN					
25...	0845	4.0	23.0	30.0	1560
JUL					
25...	1340	2.7	25.0	34.0	1500
AUG					
08...	0835	2.0	22.0	22.0	1550
SEP					
26...	1315	2.1	12.0	16.0	1500

## 06464100 - KEYA PAHA R NEAR KEYAPAHA SD (LAT 43 07 45 LONG 100 06 24)

OCT 1984					
05...	0845	17	15.0	15.5	440
NOV					
01...	0830	11	1.0	-12.0	430
21...	1100	18	.5	--	450
DEC					
27...	1245	15	.0	-1.0	490
JAN 1985					
23...	1730	14	.0	2.0	430
FEB					
21...	1000	34	.0	-.5	410
MAR					
19...	1745	80	8.5	13.5	380
APR					
19...	0915	32	17.0	24.0	460
MAY					
15...	1700	21	18.0	19.0	480
JUN					
14...	0845	11	18.5	19.0	450
JUL					
10...	1630	7.7	27.0	39.0	420
AUG					
12...	1015	14	18.5	16.5	410
SEP					
13...	0830	17	16.5	14.0	405



MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS  
WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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06464500 - KEYA PAHA R AT WEWELA SD (LAT 43 01 42 LONG 099 46 45)

OCT 1984					
05...	1015	35	15.0	16.0	440
NOV					
01...	1000	42	.5	-12.0	410
21...	1330	53	2.0	7.0	445
DEC					
27...	1515	34	.0	-.5	480
JAN 1985					
24...	1045	31	.0	.0	430
FEB					
20...	1130	36	.0	1.0	--
MAR					
20...	0845	158	--	3.0	401
APR					
19...	1045	--	18.5	25.0	--
22...	1245	112	16.0	17.5	460
MAY					
15...	1845	50	17.0	18.0	480
JUN					
14...	0930	--	--	19.0	--
18...	1345	28	20.5	19.0	470
JUL					
10...	1830	15	27.0	37.0	--
AUG					
12...	1145	75	18.0	17.0	335
SEP					
13...	1015	45	16.0	14.0	390

06467500 - MISSOURI R AT YANKTON SD (LAT 42 51 58 LONG 097 23 37)

OCT 1984					
03...	1840	45500	14.5	21.0	800
NOV					
14...	1005	48100	7.0	12.5	810
DEC					
11...	1030	23400	1.0	9.0	770
JAN 1985					
15...	1025	20900	0.5	-3.0	760
FEB					
20...	1000	21900	2.5	7.0	800
MAR					
27...	1525	19900	8.0	13.0	730
APR					
30...	1025	21400	14.5	20.0	830
MAY					
22...	1105	29600	16.0	25.0	740
JUN					
19...	1010	31800	20.0	0.0	750
JUL					
16...	1115	31600	24.0	21.0	790
AUG					
15...	1500	33500	23.0	2323.0	780
SEP					
10...	0955	31300	--	12.0	760

06471200 - MAPLE R AT ND-SD STATE LINE (LAT 45 56 20 LONG 098 27 08)

MAR 1985					
21...	0930	64	1.0	5.0	830
27...	1600	18	2.0	5.0	418
JUN					
18...	1245	1.7	17.0	20.0	860

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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## 06471500 - ELM R AT WESTPORT SD (LAT 45 39 22 LONG 098 29 48)

OCT 1984					
24...	1315	4.4	7.5	12.5	640
NOV					
27...	1100	14	.0	-4.0	660
JAN 1985					
04...	1130	4.9	.0	-1.0	--
29...	1430	1.1	.0	-11.0	750
FEB					
28...	1045	5.8	1.0	9.0	755
MAR					
21...	1130	43	6.0	10.0	380
28...	0815	20	--	-3.0	716
APR					
24...	1530	1.8	17.0	18.0	800
MAY					
23...	0845	5.0	18.0	19.5	850
JUN					
18...	1045	2.8	17.5	17.5	960
JUL					
18...	0645	7.2	24.5	20.5	591
AUG					
14...	1500	3.3	22.5	27.0	--
SEP					
11...	0815	.37	14.5	--	--

## 06475000 - JAMES R NEAR REDFIELD SD (LAT 44 54 33 LONG 098 27 34)

OCT 1984					
23...	1500	52	6.5	6.5	910
NOV					
28...	0845	--	--	-5.0	920
JAN 1985					
03...	1015	13	.0	-8.0	1790
FEB					
06...	1130	--	.0	-20.0	--
27...	1145	12	.0	8.0	--
MAR					
20...	1145	1230	1.5	4.0	800
28...	1700	597	1.0	3.0	575
APR					
23...	1715	142	17.0	17.0	990
MAY					
24...	0845	27	17.0	19.5	1170
JUN					
17...	1600	8.6	20.0	19.0	1440
JUL					
19...	0715	1.4	26.0	24.5	1400
AUG					
13...	1445	1.8	24.0	25.0	--
SEP					
11...	1345	19	16.0	17.5	1600

## 06476500 - SAND CR NEAR ALPENA SD (LAT 44 09 15 LONG 098 26 06)

NOV 1984					
21...	1600	0.35	5.0	8.0	2200
DEC					
10...	1430	0.47	4.5	10.0	2600
FEB 1985					
27...	1510	2.2	1.0	8.5	730
MAR					
14...	0920	8.1	0.0	4.0	950
17...	1725	374	2.0	11.0	340
19...	1645	463	7.5	17.0	450
22...	1100	203	8.0	12.5	--
APR					
25...	1505	3.5	15.0	16.0	1370
MAY					
17...	1150	0.66	17.0	19.0	1790
JUN					
20...	1445	0.02	26.0	29.0	1900

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06477000 - JAMES R NEAR FORESTBURG SD (LAT 43 58 26 LONG 098 04 14)					
OCT 1984					
17...	1300	56	10.0	13.5	1300
NOV					
21...	1310	142	1.0	10.0	1130
DEC					
07...	1440	90	1.5	9.5	1120
JAN 1985					
03...	1305	36	0.0	9.0	1500
FEB					
14...	1345	9.7	0.5	0.0	1640
27...	1300	50	0.5	8.0	900
MAR					
14...	1510	158	1.0	8.0	1050
17...	1545	2390	3.0	13.0	510
19...	1505	3360	5.5	17.0	460
26...	1100	2920	7.0	10.0	660
APR					
25...	1125	335	13.0	15.0	1080
MAY					
22...	0950	137	20.5	24.5	1140
JUN					
20...	1140	39	22.0	25.0	1310
JUL					
26...	1140	15	26.0	23.0	1780
AUG					
08...	1250	5.8	28.0	33.0	1680

## 06477500 - FIRESTEEL CR NEAR MOUNT VERNON SD (LAT 43 46 30 LONG 098 14 33)

OCT 1984					
17...	1005	2.1	7.5	10.5	1670
NOV					
21...	1025	2.1	3.0	5.0	2010
DEC					
07...	1115	1.4	1.5	8.0	2450
JAN 1985					
03...	1015	0.84	0.5	-1.0	2680
FEB					
14...	1035	0.24	0.5	-4.0	3100
27...	1050	6.2	0.5	7.0	940
MAR					
14...	1230	7.2	0.0	6.0	1080
17...	1110	2020	2.5	10.0	340
19...	1145	777	6.5	17.0	350
APR					
25...	0900	17	12.0	12.0	1620
MAY					
17...	1000	4.2	16.0	19.0	1700
JUN					
20...	0935	2.3	19.5	20.0	1410
AUG					
02...	1140	0.15	24.0	26.0	2100
29...	1445	0.35	27.0	26.0	1700
SEP					
19...	0925	0.87	23.0	25.0	1480

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06478052 - ENEMY CR NEAR MITCHELL SD (LAT 43 38 33 LONG 097 59 09)					
OCT 1984					
19...	1500	13	8.0	11.5	2350
NOV					
16...	1420	3.0	2.0	9.0	1980
DEC					
06...	1550	1.1	1.0	-3.5	2680
JAN 1985					
11...	1230	0.24	0.5	-12.0	2850
FEB					
22...	1340	14	0.5	10.5	1030
MAR					
13...	1030	39	1.0	2.0	1120
15...	1445	250	1.5	17.0	900
17...	1325	234	3.0	8.0	640
29...	1115	12	4.5	1.0	1980
APR					
19...	1450	13	21.0	28.0	2340
MAY					
16...	1400	43	14.0	20.0	1630
JUN					
25...	1120	0.43	27.0	36.0	2050
JUL					
26...	0945	0.16	25.0	29.0	2040
SEP					
27...	1250	0.33	13.0	13.0	1320

## 06478513 - JAMES RIVER NR YANKTON SD (LAT 42 59 45 LONG 097 22 10)

OCT 1984					
09...	1635	182	17.5	18.0	1650
NOV					
14...	1335	212	7.0	11.5	1920
DEC					
11...	1225	216	0.5	10.5	1550
JAN 1985					
15...	1450	86	0.0	-5.0	1950
FEB					
20...	1310	98	0.5	9.0	2030
MAR					
13...	1430	1120	3.0	6.0	940
28...	1005	3580	8.0	9.5	610
APR					
30...	1420	936	--	21.0	1570
MAY					
22...	1400	435	22.0	30.0	--
JUN					
19...	1305	175	21.0	24.0	1540
JUL					
16...	1450	32	25.0	27.5	1640
AUG					
15...	1135	46	21.5	20.0	1690
SEP					
10...	1210	87	20.0	12.0	1440

## 06478540 - LITTLE VERMILLION R NEAR SALEM SD (LAT 43 47 39 LONG 097 22 02)

FEB 1985					
23...	1800	13	0.5	0.5	690
MAR					
14...	1520	226	1.0	6.0	360
15...	1220	319	--	10.0	340
19...	1425	122	12.0	15.0	410
APR					
22...	1135	1.5	15.0	17.0	1140
MAY					
23...	1135	0.08	21.0	22.0	1200

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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06478690 - WEST FORK VERMILLION R NEAR PARKER SD (LAT 43 24 55 LONG 097 12 18)

OCT 1984					
16...	1245	5.8	8.5	8.0	1480
NOV					
19...	1310	3.5	2.5	2.0	1700
DEC					
10...	1110	2.7	1.0	1.0	1850
JAN 1985					
03...	0910	1.1	1.0	-5.0	2120
FEB					
14...	1235	1.7	0.0	-7.0	3900
27...	1725	15	0.5	8.0	1050
MAR					
12...	1235	389	1.0	0.0	430
14...	1330	1020	1.0	6.0	440
26...	1205	83	8.0	19.0	730
APR					
22...	1420	29	16.5	16.0	1570
MAY					
23...	0950	8.7	19.0	21.0	1800
JUN					
18...	1150	6.2	17.0	19.0	1620
JUL					
22...	1430	0.63	24.5	27.0	1370
AUG					
14...	1140	0.72	20.0	21.0	1230

06479010 - VERMILLION RIVER NR VERMILLION SD (LAT 42 49 02 LONG 096 55 26)

OCT 1984					
10...	1105	117	14.5	19.0	1460
NOV					
14...	1555	138	7.0	11.0	1630
DEC					
11...	1510	106	3.0	10.0	1520
JAN 1985					
16...	0905	64	0.0	-8.0	1550
FEB					
20...	1510	46	1.0	6.0	1420
MAR					
13...	0840	1320	--	1.5	710
27...	0920	831	8.0	6.0	830
MAY					
01...	0920	1690	16.5	15.0	1300
23...	1700	265	22.0	26.5	--
JUN					
19...	1615	114	20.0	25.0	1460
JUL					
17...	1215	75	21.0	30.0	1460
AUG					
15...	0935	66	17.0	20.5	1500
SEP					
10...	1455	84	19.0	20.0	1520



## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06479215 - BIG SIOUX RIVER NR FLORENCE SD (LAT 45 10 51 LONG 097 11 09)					
OCT 1984					
10...	1335	0.18	14.5	15.0	700
NOV					
08...	1120	5.0	4.0	10.0	700
DEC					
05...	1040	3.6	0.0	--	500
JAN 1985					
09...	0940	0.15	0.0	-12.0	350
FEB					
08...	0915	0.03	0.0	-24.0	740
22...	1045	0.39	0.5	1.0	350
MAR					
19...	1110	185	2.0	12.5	180
20...	0920	220	2.5	2.0	210
21...	1025	143	5.0	12.0	230
22...	0840	102	4.5	5.0	230
APR					
17...	1630	6.7	17.0	27.0	570
MAY					
16...	1610	11	16.0	--	610
JUN					
12...	1450	1.8	19.0	17.0	570
JUL					
09...	1445	0.01	26.0	26.0	705
AUG					
06...	1405	0.01	24.5	27.5	675
SEP					
04...	0925	13	19.0	16.0	420
10...	0915	15	15.0	12.0	--

## 06479438 - BIG SIOUX R NEAR WATERTOWN SD (LAT 45 00 22 LONG 097 09 53)

OCT 1984					
10...	1135	3.6	14.0	14.0	630
NOV					
07...	1655	18	5.0	4.0	680
DEC					
05...	1325	8.8	0.0	--	590
JAN 1985					
09...	1140	2.7	0.0	-13.0	500
FEB					
22...	1225	1.0	0.5	4.0	600
MAR					
19...	1335	1180	3.5	19.5	170
20...	1110	992	2.0	6.5	190
21...	1310	574	6.0	16.0	220
APR					
17...	1355	25	12.0	23.0	580
MAY					
16...	1300	46	11.0	20.0	510
JUN 1985					
12...	1240	7.7	17.0	16.0	550
JUL					
09...	1315	0.93	26.0	26.0	560
AUG					
06...	1225	2.7	24.0	26.0	625
SEP					
04...	1135	30	20.0	17.5	530
10...	1135	95	15.0	16.0	--

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06479515 - WILLOW CR NEAR WATERTOWN SD (LAT 44 54 17 LONG 097 03 31)					
OCT 1984					
10...	0945	4.6	14.0	14.0	940
NOV					
07...	1540	11	6.0	12.0	990
DEC					
04...	1650	6.8	0.0	-6.0	680
JAN 1985					
08...	1600	2.2	0.0	-12.0	880
FEB					
07...	1245	0.27	0.0	-20.0	1580
22...	1345	67	0.5	4.0	250
MAR					
19...	0840	658	0.5	4.0	190
21...	0750	327	1.0	3.0	240
APR					
17...	0945	38	11.0	22.0	630
MAY					
17...	0945	23	13.0	13.0	740
JUN					
12...	0950	6.5	17.0	15.0	770
JUL					
09...	1120	1.0	25.0	26.0	830
AUG					
06...	1605	1.7	27.5	27.5	820
SEP					
04...	1300	71	20.0	22.0	400
06479525 - BIG SIOUX R NEAR CASTLEWOOD SD (LAT 44 43 54 LONG 097 02 39)					
OCT 1984					
09...	1730	22	16.5	15.5	910
NOV					
07...	1400	46	7.0	12.0	960
DEC					
04...	1455	28	0.0	-5.0	900
JAN 1985					
08...	1425	15	0.0	-12.0	800
FEB					
07...	1035	2.2	0.0	-29.0	1210
22...	1510	164	0.5	4.0	550
MAR					
18...	1715	1560	3.0	12.0	250
21...	1620	931	6.0	14.0	260
APR					
18...	1015	191	14.0	23.0	610
MAY					
15...	1450	83	10.0	12.0	720
JUN					
13...	0915	33	16.0	16.0	650
JUL					
10...	0920	7.4	19.5	21.0	790
AUG					
07...	0905	14	19.5	24.5	780
SEP					
03...	1600	196	22.0	24.5	440
09...	1800	323	16.0	19.0	--

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06479529 - STRAY HORSE CR NEAR CASTLEWOOD SD (LAT 44 43 52 LONG 096 57 23)					
OCT 1984					
09...	1520	2.9	16.0	17.0	930
NOV					
07...	1245	8.8	5.5	10.5	1200
DEC					
04...	1250	4.2	0.5	-5.0	890
JAN 1985					
08...	1140	0.97	0.0	-12.0	900
FEB					
06...	1415	0.14	0.0	-19.0	1680
22...	1620	72	0.0	4.0	310
MAR					
18...	1515	462	2.0	15.0	250
19...	1650	470	2.0	14.0	270
20...	1710	234	3.0	11.0	300
22...	1140	195	4.0	11.0	340
APR					
18...	1345	7.3	20.0	32.0	900
MAY					
15...	1140	11	11.0	12.0	1000
JUN					
13...	1200	2.0	19.0	21.0	960
JUL					
10...	1055	0.26	23.0	24.0	1180
AUG					
07...	1305	0.38	25.0	30.5	875
SEP					
03...	1345	305	20.5	25.5	420

## 06479640 - HIDEWOOD CR NEAR ESTELLINE SD (LAT 44 36 42 LONG 096 54 17)

OCT 1984					
09...	1305	11	15.0	16.5	1080
NOV					
07...	1120	45	5.0	10.5	940
DEC					
04...	1105	21	0.0	-5.0	950
JAN 1985					
08...	0940	5.9	0.0	-6.0	520
FEB					
22...	1755	78	0.5	4.0	290
MAR					
15...	1040	200	0.0	8.0	280
18...	1220	630	1.5	9.0	210
20...	1500	672	3.0	12.0	300
22...	1425	680	5.0	11.5	350
APR					
16...	1655	58	11.0	13.0	670
MAY					
15...	0950	33	10.0	--	860
JUN					
11...	1540	12	18.0	15.0	890
JUL					
10...	1235	3.0	23.0	25.0	880
AUG					
07...	1445	2.5	25.5	31.5	1000
SEP					
03...	1200	79	20.5	24.0	760
09...	1420	183	16.0	19.0	--
24...	1120	2.1	8.0	9.0	1370

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06479980 - MEDARY CR NEAR BROOKINGS, SD (LAT 44 13 27 LONG 096 46 06)					
OCT 1984					
18...	1110	179	7.0	7.0	880
NOV					
07...	0915	77	4.5	8.0	970
DEC					
04...	0905	42	0.0	-8.0	860
JAN 1985					
07...	1550	16	0.0	2.0	610
FEB					
06...	0900	5.5	0.0	-20.0	880
23...	0845	322	0.5	0.0	280
MAR					
15...	1645	1530	3.0	16.0	280
16...	0900	1110	1.0	2.0	260
19...	0910	595	5.0	4.0	320
APR					
16...	1355	66	11.0	12.0	730
MAY					
14...	1500	38	13.0	--	--
JUN					
11...	1225	48	17.0	19.0	870
JUL					
10...	1445	5.7	24.0	27.0	815
AUG					
09...	--	--	--	--	--
09...	0940	2.0	23.0	25.0	780
SEP					
04...	1625	47	21.0	23.0	820

## 06480000 - BIG SIOUX RIVER NEAR BROOKINGS SD (LAT 44 10 48 LONG 096 44 55)

OCT 1984					
18...	0925	769	7.0	10.0	920
NOV					
06...	1615	510	5.0	8.5	1040
DEC					
03...	1635	174	0.0	-8.0	940
JAN 1985					
07...	1415	91	0.0	3.0	920
FEB					
05...	1710	46	0.5	-17.0	1110
23...	1035	450	0.5	2.0	430
MAR					
15...	1430	1200	2.0	11.0	410
18...	1815	6650	6.0	8.0	620
APR					
16...	1120	934	12.0	12.0	840
MAY					
14...	1225	566	--	11.0	930
JUN					
11...	1025	350	16.0	17.0	980
JUL					
11...	0900	109	23.0	21.0	1010
AUG					
08...	0915	91	24.5	24.5	1000
SEP					
05...	0805	447	19.5	17.5	760
30...	1545	506	8.0	5.5	960

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06480400 - SPRING CR NEAR FLANDREAU SD (LAT 44 07 18 LONG 096 35 19)					
OCT 1984					
17...	1815	38	7.0	--	740
NOV					
06...	1355	14	4.5	12.0	820
DEC					
03...	1155	8.9	0.0	-10.0	550
JAN 1985					
07...	1245	7.6	0.0	0.0	500
FEB					
05...	1505	3.7	0.0	-15.0	710
23...	1150	44	0.0	2.0	340
MAR					
13...	1145	231	--	--	--
15...	1205	252	1.5	9.0	250
16...	1115	290	1.0	3.0	230
18...	1535	112	6.0	11.0	340
APR					
15...	1645	17	17.0	28.0	700
MAY					
13...	1550	7.2	15.0	19.0	720
JUN					
10...	1455	7.3	19.0	14.0	760
JUL					
11...	1035	2.6	22.0	23.0	730
AUG					
08...	1105	2.6	23.5	27.0	730
SEP					
05...	1015	123	17.5	21.5	380
30...	1325	9.9	6.5	4.5	770

## 06480650 - FLANDREAU CR ABOVE FLANDREAU SD (LAT 44 03 45 LONG 096 29 14)

OCT 1984					
17...	1655	89	8.0	9.5	800
NOV					
06...	1150	24	3.5	10.0	910
DEC					
03...	1340	15	0.5	-6.0	590
JAN 1985					
07...	1135	4.9	0.0	-2.0	490
FEB					
05...	1245	2.2	0.0	-17.0	920
23...	1315	120	0.5	2.0	280
MAR					
12...	1320	795	--	6.0	220
15...	1005	414	1.0	2.0	260
18...	1410	186	6.5	8.0	320
APR					
15...	1300	30	15.0	25.0	730
MAY					
13...	1250	16	14.0	23.0	820
JUN					
10...	1155	21	19.0	15.0	830
JUL					
11...	1205	3.7	23.0	26.0	740
AUG					
08...	1405	2.3	27.5	27.5	810
SEP					
05...	1200	346	18.5	21.5	350
30...	1205	22	7.0	7.0	860



## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06481000 - BIG SIOUX R NEAR DELL RAPIDS SD (LAT 43 47 25 LONG 096 44 42)					
OCT 1984					
17...	1245	474	9.0	11.0	980
NOV					
20...	1500	441	0.5	2.0	1040
DEC					
11...	1115	310	0.5	4.5	1120
JAN 1985					
02...	1420	131	0.0	-5.0	1120
FEB					
13...	1500	66	0.0	-2.0	1170
MAR					
16...	1425	3900	2.0	7.0	320
18...	1020	4730	2.0	5.0	350
22...	1300	7610	8.0	12.0	380
APR					
25...	0920	3180	11.0	15.5	780
MAY					
21...	1320	775	19.0	21.0	960
JUN					
19...	0945	334	17.5	21.0	980
JUL					
23...	1745	145	26.5	33.5	870
AUG					
15...	1525	216	23.0	25.0	850
SEP					
26...	1230	654	10.5	9.0	915

06481480 - SKUNK CR NR CHESTER SD (LAT 43 50 53 LONG 096 50 10)

OCT 1984					
17...	1435	26	8.0	11.0	1300
NOV					
21...	0900	9.2	0.0	-2.0	1460
DEC					
11...	1305	12	1.0	4.5	1510
JAN 1985					
02...	1220	3.6	0.0	-7.0	1280
FEB					
11...	1305	1.9	0.0	-13.0	1630
23...	1515	32	0.0	2.0	1360
MAR					
16...	1830	464	2.0	6.0	770
17...	1150	817	3.0	13.0	700
18...	1155	728	3.0	6.0	610
23...	1225	442	6.5	6.0	910
APR					
04...	1355	281	9.5	7.0	1130
25...	1210	257	11.0	15.5	1110
MAY					
21...	1110	48	18.0	17.0	1260
JUN					
20...	0825	12	17.5	17.0	1240
JUL					
23...	1405	0.77	24.5	27.5	790
AUG					
16...	0920	1.2	16.0	17.0	790
SEP					
26...	1450	1.5	12.0	12.0	1140
19...	1300	115	25.0	30.0	1470

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06481489 - WEST BRANCH SKUNK CR NR HARTFORD SD (LAT 43 40 03 LONG 096 55 47)					
OCT 1984					
16...	1520	12	5.0	7.0	1320
NOV					
19...	1505	3.9	1.5	1.0	1330
DEC					
10...	1250	2.8	1.0	4.5	1180
JAN 1985					
03...	1105	1.0	1.0	-3.0	1160
FEB					
14...	1040	0.34	0.5	-10.0	830
23...	1630	10	0.0	1.5	800
MAR					
14...	1430	156	1.0	5.0	490
16...	1625	496	5.0	8.0	390
17...	0930	329	1.5	3.0	410
19...	1210	170	6.0	12.0	560
23...	1030	51	6.0	5.0	770
APR					
24...	0930	187	9.0	13.0	1100
MAY					
21...	1450	6.0	21.0	22.0	1420
JUN					
18...	1435	2.1	18.5	20.0	1220
JUL					
23...	1130	0.61	23.0	25.0	750
AUG					
14...	1345	1.2	24.0	22.5	820

## 06481500 - SKUNK CR AT SIOUX FALLS SD (LAT 43 32 01 LONG 096 47 26)

OCT 1984					
16...	1750	71	7.0	4.0	1140
NOV					
20...	0845	20	0.5	2.0	1210
DEC					
10...	1615	26	1.0	5.5	1330
JAN 1985					
03...	1520	11	0.0	-1.0	1380
FEB					
14...	0910	6.8	0.0	-15.0	1320
28...	0900	29	0.0	2.0	870
MAR					
14...	0815	788	0.0	1.0	540
APR					
24...	1630	1440	12.0	20.0	860
MAY					
22...	0900	96	19.0	14.0	1220
JUN					
18...	1605	40	18.5	21.5	1130
JUL					
23...	0855	6.3	20.5	22.0	930
AUG					
14...	1635	17	23.0	25.0	860
SEP					
26...	0845	16	8.0	2.5	1070

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
06482020 - BIG SIOUX R AT NORTH CLIFF AVE AT SIOUX FALLS SD (LAT 43 34 01 LONG 096 42 39)					
OCT 1984					
17...	0925	463	9.0	3.0	1000
NOV					
20...	1050	438	0.5	1.0	1180
DEC					
11...	0850	371	0.5	5.0	1160
JAN 1985					
03...	1335	161	0.5	-2.0	1280
FEB					
13...	1625	73	1.0	-3.0	1500
28...	1050	667	1.0	4.0	560
MAR					
14...	1025	2750	1.0	3.0	410
22...	1525	8390	8.0	12.0	440
APR					
24...	1355	5730	12.0	16.0	750
MAY					
22...	1215	963	--	16.5	1020
JUN					
19...	1440	384	21.0	25.0	1080
JUL					
25...	1135	277	24.0	24.0	1040
AUG					
15...	1250	203	22.0	26.5	1050
SEP					
25...	1130	719	11.5	13.0	920

## 06482610 - SPLIT ROCK CR AT CORSON SD (LAT 43 36 59 LONG 096 33 54)

OCT 1984					
17...	1055	116	7.0	8.5	730
NOV					
20...	1300	99	0.5	0.5	850
DEC					
10...	1430	52	1.0	8.0	830
JAN 1985					
02...	1635	23	0.0	-7.0	840
FEB					
13...	1045	13	0.0	-10.0	900
28...	1315	85	0.5	12.0	430
MAR					
13...	1340	2140	1.0	7.0	340
15...	0930	1250	2.0	5.0	270
17...	1635	724	6.5	14.0	320
APR					
24...	1135	1810	11.0	18.0	500
MAY					
22...	1425	107	19.5	21.0	800
JUN					
19...	1155	51	20.0	20.5	660
JUL					
24...	1515	68	25.0	28.5	510
AUG					
14...	1505	44	23.0	23.0	600
SEP					
25...	1640	82	11.0	9.5	810

## MISCELLANEOUS TEMPERATURE MEASUREMENTS AND FIELD DETERMINATIONS

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	TEMPER- ATURE (DEG C)	TEMPER- ATURE, AIR (DEG C)	SPE- CIFIC CON- DUCT- ANCE (US/CM)
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06485696 - BRULE CREEK NR ELK POINT SD (LAT 42 48 32 LONG 096 41 11)

OCT 1984					
10...	1340	27	15.0	19.0	1180
NOV					
15...	0830	40	4.0	-1.5	1080
DEC					
11...	1655	37	0.5	5.0	950
JAN 1985					
16...	1130	16	0.0	-8.0	1160
FEB					
12...	1010	7.0	0.0	-8.0	1240
27...	1255	22	0.5	4.0	860
MAR					
12...	1730	89	2.0	4.0	840
27...	1105	85	9.0	12.0	880
APR					
23...	1230	1910	12.0	12.0	550
MAY					
01...	1200	199	16.0	20.0	1060
23...	1440	62	22.0	30.5	1070
JUN					
20...	0855	39	18.5	20.0	1020
JUL					
17...	1625	18	29.0	34.5	965
AUG					
14...	0925	49	20.0	17.5	755
SEP					
11...	0825	34	17.0	16.0	1080

## MISCELLANEOUS RAINFALL DATA

434002103214500 CUSTER STATE PARK, SD

ACCUMULATED RAINFALL, IN INCHES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
SUMMATION VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.02	.00	.00	.00	.05	.00	.00
2	.00	.00	.00	.00	.00	.32	.00	.00	.00	.00	.00	.05
3	.00	.00	.00	.00	.00	.18	.45	.00	.00	.00	.00	.00
4	.03	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00
5	.15	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.20	.00	.15	.00	.00	.00	.00	.00	.00	.00	.43
9	.00	.28	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.16	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00
11	.00	.00	.06	.00	.00	.00	.02	.10	.15	.00	.08	.27
12	.00	.00	.03	.00	.00	.00	.00	.00	.00	.00	.03	.35
13	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.06	.00	.00	.00	.00	.00	.00	.00	.03	.17
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.90	.00	.07
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.05
17	.00	.00	.11	.00	.00	.00	.00	.33	.00	.00	.00	.00
18	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.09	.05	.00	.00	.90	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.05	.08	.05	.00	.00	.00	.00	.00
23	.00	.00	.08	.00	.04	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.04	.00	.00	.00	.00	.25	.00	.00
25	.00	.00	.00	.00	.03	.00	.15	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.30	.00	.35	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00
28	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.13	---	.00	.00	.04	.00	1.20	.70	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.05	.00	---

434444103282000 CUSTER STATE PARK, SD

ACCUMULATED RAINFALL, IN INCHES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
SUMMATION VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.45	.09	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.45	.25	.00	.00	.00	.00	.00
4	.05	.00	.00	.02	.00	.00	.08	.00	.00	.00	.00	.10
5	.41	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05
8	.00	.25	.00	.19	.00	.00	.00	.00	.00	.00	.00	.60
9	.00	.30	.00	.04	.00	.00	.00	.00	.00	.00	.20	.00
10	.00	.12	.00	.00	.00	.00	.00	.00	.25	.00	.00	.00
11	.00	.00	.14	.00	.00	.00	.00	.00	.15	.00	.00	.33
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	1.25
13	.00	.00	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.03	.00	.00	.08	.00	.05	.00	.10	.00	.20
15	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00	.05
16	.00	.00	.06	.00	.00	.00	.00	.00	.00	.15	.00	.05
17	.00	.00	.03	.00	.00	.00	.00	.80	.00	.00	.00	.00
18	.24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.25	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.23	.00	.00
21	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.10	.18	.00	.00	.00	.00	.00
23	.00	.00	.23	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.08	.00	.15	.00	.05	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.30	.00	.40	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.00	.00
28	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.13	---	.00	.00	.25	.00	1.20	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.10	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.05	.00	---



## MISCELLANEOUS RAINFALL DATA

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441037103292701 OX BOW RANCH NEAR NEMO, SD

ACCUMULATED RAINFALL, IN INCHES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
SUMMATION VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.03	.00	.00	.05	.00	.00	.03	.00	.01	.00
2	.00	.00	.00	.00	.00	.05	.00	.00	.05	.00	.00	.30
3	.00	.00	.00	.00	.00	.10	.30	.00	.20	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.30	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.20	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.60	.00
8	.00	.44	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.56	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.20	.00	.00	.00
11	.00	.00	.00	.00	.00	.10	.00	.00	.05	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.48
13	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.20	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.12	.00	.00	.00	.00	.00	.20	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.08	.00	.00	.05	.00	.00	.00	.00	.10	.00	.00	.01
19	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00	.76	.02
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.10	.00	.00	.10	.00	.00
23	.00	.00	.15	.00	.05	.00	.00	.00	.00	.10	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.10	.15	.00	.00
25	.00	.02	.00	.00	.07	.00	.00	.50	.00	.15	.00	.10
26	.00	.03	.00	.00	.00	.00	.22	.80	.24	.00	.00	.08
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.20	.00	1.80	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.15	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.40	.00	.00	.00
31	.00	---	.00	.00	---	.22	---	.00	---	.00	.00	---

441859103385600 ADAMS RANCH NR LEAD, SD

ACCUMULATED RAINFALL, IN INCHES, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985  
SUMMATION VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.10	.00	.03	.10	.05	.00	.03	.07	.00	.00
2	.00	.00	.00	.00	.00	.10	.00	.00	.05	.00	.00	.17
3	.00	.00	.00	.00	.00	.53	.40	.00	.25	.00	.00	.00
4	.00	.00	.00	.00	.00	.07	.25	.00	.00	.00	.00	.00
5	.60	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.05	.00	.00	.00	.00	.00	.03	.00	.00	.00	.08	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.15	.00
8	.00	.23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.34	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00
10	.00	.30	.00	.00	.00	.00	.00	.00	.50	.00	.00	.00
11	.00	.00	.00	.00	.00	.20	.00	.15	.10	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.23	.00	.00	.00	.00	.30
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.20	.00	.00	.00	.00	.00	.04	.00	.00
15	.05	.00	.07	.10	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.05	.00	.00
18	.00	.00	.00	.08	.00	.00	.00	.30	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.35	.00	.00	.00	.54	.02
20	.00	.00	.05	.00	.00	.00	.00	.00	.05	.00	.00	.00
21	.00	.00	.00	.00	.04	.00	.00	.00	.45	.00	.00	.00
22	.00	.00	.20	.00	.00	.13	.02	.08	.00	.05	.00	.10
23	.12	.00	.00	.00	.08	.00	.00	.00	.00	.04	.00	.10
24	.05	.00	.00	.00	.00	.00	.00	.00	.00	.13	.00	.47
25	.00	.08	.00	.00	.10	.00	.00	.20	.00	.00	.00	.62
26	.00	.40	.00	.00	.00	.00	.15	.50	.50	.00	.00	.05
27	.22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.15
28	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.23	.04
29	.00	.00	.03	.00	---	.00	.00	.00	.02	.10	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.20	.00	.00	.00	.04
31	.00	---	.00	.00	---	.58	---	.00	---	.00	.00	---

## GROUND-WATER LEVELS

The ground-water observation well network in South Dakota is used to monitor quantitative and at times qualitative changes in the glacial and bedrock aquifers. Federal, state, and local agencies monitor approximately 2,000 wells throughout the state. These wells are a sample of the South Dakota observation well network. All measurements are in feet above or below land-surface datum. Wells in Hughes and Sully Counties are measured periodically with chalked tape by USGS personnel.

## AURORA COUNTY

435039098263403.

LOCATION.--Lat 43°50'39", long 98°26'34", in SW¼SW¼SW¼NW¼ sec.6, T.104 N., R.63 W., Hydrologic Unit 10160011, 8.5 mi north-northeast of Plankinton. Owner: South Dakota Department of Water and Natural Resources.

AQUIFER.--Niobrara.

INSTRUMENTATION.--Digital water-level recorder -- 60-minute punch.

WELL CHARACTERISTICS.--Drilled artesian observation well, diameter 6 in, depth 134 ft, perforated 114 to 134 ft.

DATUM.--Elevation of land-surface datum is 1,418 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing 2.0 ft above land-surface datum.

PERIOD OF RECORD.--April 1979 to current year.

## WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	---	58.92	57.13	56.82	55.75	56.07	54.44	54.64	---	---	---	62.47
10	---	59.16	56.26	55.26	55.69	56.20	54.43	54.71	---	---	---	61.63
15	---	56.50	56.41	55.46	55.87	56.29	54.49	54.52	---	---	---	60.89
20	---	56.60	56.52	55.41	55.93	56.23	54.70	54.41	---	---	---	60.26
25	58.37	57.04	56.48	55.56	55.91	54.27	54.57	54.51	---	---	---	59.73
EOM	58.74	57.04	56.56	55.61	55.94	54.29	54.60	53.93	---	---	63.76	59.37
MAX	---	59.45	57.13	56.87	55.94	56.32	54.70	54.72	---	---	---	63.50

WTR YR 1985 HIGH 53.39 JUN 1

NOTE: Instantaneous observations are the maximum depths below land surface.

## BEADLE COUNTY

442112098174001.

LOCATION.--Lat 44°21'12", long 98°17'40", in SW¼SW¼SW¼NW¼ sec.9, T.110 N., R.62 W., Hydrologic Unit 10160006, at southwest corner of city well field, 3.5 mi west of Huron. Owner: City of Huron.

AQUIFER.--Glacial Outwash.

INSTRUMENTATION.--Digital water-level recorder -- 60-minute punch.

WELL CHARACTERISTICS.--Drilled unused public supply artesian well, diameter 12 in, depth 74 ft, perforated 38 to 74 ft.

DATUM.--Elevation of land-surface datum is 1,306.93 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of platform 2.00 ft above land-surface datum.

PERIOD OF RECORD.--February 1954 to current year.

## WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	40.41	39.35	40.02	39.39	38.81	50.97	39.77	38.70	38.27	39.47	39.90	39.53
10	40.15	39.64	39.63	39.87	38.79	49.17	39.59	38.52	38.20	39.78	40.60	47.16
15	39.64	39.38	39.47	39.57	38.72	49.47	39.28	38.62	38.15	39.78	40.89	48.04
20	39.82	38.30	39.23	39.35	44.19	41.99	38.98	38.61	38.26	40.09	40.82	49.14
25	39.82	37.81	39.16	39.14	46.70	40.94	38.83	38.58	39.22	39.84	40.69	43.14
EOM	39.55	37.85	39.17	38.96	47.18	40.39	38.83	38.20	39.52	39.75	40.22	40.88
MAX	40.73	39.68	40.02	40.03	47.46	51.41	40.22	38.93	39.58	40.09	40.99	49.17

WTR YR 1985 HIGH 37.55 NOV 26

NOTE: Instantaneous observations are the maximum depths below land surface.

## FALL RIVER COUNTY

432015103535801.

LOCATION.--Lat 43°20'15", long 103°53'58", in SW¼SW¼NE¼SE¼ sec.20, T.8 S., R.2 E., Hydrologic Unit 10120106, 5 mi northwest of Edgemont. Owner: D. Heldman.

AQUIFER.--Lakota.

INSTRUMENTATION.--Periodically measured with chalked tape by USGS personnel.

WELL CHARACTERISTICS.--Drilled artesian stock well, diameter 5 in, depth 410 ft.

DATUM.--Elevation of land-surface datum is 3,532 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of casing 0.60 ft above land-surface datum.

PERIOD OF RECORD.--September 1956 to current year.

## WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

MAY 08, 1985 40.7

## GROUND-WATER LEVELS

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## HUGHES COUNTY

SITE NUMBER 442451100155501 LOCAL NUMBER 111N78W18DCBA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20, 1985	53.67	JUN 06, 1985	50.76	AUG 15, 1985	52.50

SITE NUMBER 442504100160001 LOCAL NUMBER 111N78W18DBBB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20, 1985	17.90	JUN 06, 1985	18.41	AUG 15, 1985	19.68

SITE NUMBER 442504100163201 LOCAL NUMBER 111N78W18CBBA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20, 1985	16.80	JUN 06, 1985	16.39	AUG 15, 1985	17.57

SITE NUMBER 443018099580301 LOCAL NUMBER 112N76W16DAAA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	11.90	JUN 06, 1985	10.84	AUG 15, 1985	15.75

SITE NUMBER 443018099594901 LOCAL NUMBER 112N76W17DBBB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	20.70	JUN 06, 1985	20.29	AUG 15, 1985	21.19

SITE NUMBER 443026099592101 LOCAL NUMBER 112N76W17ADDB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	9.25	JUN 06, 1985	9.11	AUG 15, 1985	10.75

SITE NUMBER 443039099575901 LOCAL NUMBER 112N76W15BBBC

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	9.40	JUN 06, 1985	8.14	AUG 15, 1985	8.65

SITE NUMBER 443039099575902 LOCAL NUMBER 112N76W15BBBC2

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	9.40	JUN 06, 1985	8.18	AUG 15, 1985	10.02

## GROUND-WATER LEVELS

## HUGHES COUNTY--Continued

SITE NUMBER 443049099565901 LOCAL NUMBER 112N76W10DDCD

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19, 1985	8.80	JUN 06, 1985	7.70	AUG 15, 1985	9.80

SITE NUMBER 443049099585801 LOCAL NUMBER 112N76W 9CCDD

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20, 1985	0.70	JUN 06, 1985	2.40	AUG 15, 1985	5.01

SITE NUMBER 443102099594401 LOCAL NUMBER 112N76W 8DBCD

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	12.83	JUN 06, 1985	12.74

SITE NUMBER 443108099585801 LOCAL NUMBER 112N76W 9CBAA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	11.00	JUN 06, 1985	11.57	AUG 15, 1985	15.96

SITE NUMBER 443134099575801 LOCAL NUMBER 112N76W10BBB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	9.25	JUN 06, 1985	9.04	AUG 15, 1985	9.65

SITE NUMBER 443142099472901 LOCAL NUMBER 112N75W 1DCDC

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	5.80	JUN 06, 1985	6.58	AUG 15, 1985	6.31

SITE NUMBER 443157099565001 LOCAL NUMBER 112N76W 3DADA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	16.25	JUN 06, 1985	14.47	AUG 15, 1985	16.37

SITE NUMBER 443226099550501 LOCAL NUMBER 112N76W 1BAAB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	9.80	JUN 06, 1985	9.84	AUG 15, 1985	10.40

## GROUND-WATER LEVELS

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## HUGHES COUNTY--Continued

SITE NUMBER 443226099560401 LOCAL NUMBER 112N76W 2ABBA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19, 1985	5.50	JUN 06, 1985	5.52	AUG 15, 1985	4.02

SITE NUMBER 443226099560501 LOCAL NUMBER 112N76W 2ABBB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	1.35	JUN 06, 1985	2.59	AUG 15, 1985	2.89

SITE NUMBER 443226099563701 LOCAL NUMBER 112N76W 2BBAB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	6.20	JUN 06, 1985	5.17	AUG 15, 1985	6.33

SITE NUMBER 443226099564601 LOCAL NUMBER 112N76W 2BBBB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	5.90	JUN 06, 1985	5.30	AUG 15, 1985	6.48

SITE NUMBER 443255099472401 LOCAL NUMBER 113N76W35CCDC

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	35.35	JUN 06, 1985	34.90	AUG 15, 1985	35.11

## LAWRENCE COUNTY

443515103513901.

LOCATION.--Lat 44°35'15", long 103°51'39", in SE¼NE¼NW¼ sec.10, T.7 N., R.2 E., Hydrologic Unit 10120203, 4.5 mi north of Spearfish. Owner: South Dakota Department of Water and Natural Resources.

AQUIFER.--Minnelusa.

INSTRUMENTATION.--Pressure recorder.

WELL CHARACTERISTICS.--Drilled artesian observation well, diameter 5 in, depth 1,306 ft, perforated 1,266 to 1,306 ft.

DATUM.--Elevation of land-surface datum is 3,205 ft above National Geodetic Vertical Datum of 1929. Measuring point: Base of gage 2.5 ft above land-surface datum.

PERIOD OF RECORD.--April 1963 to current year.

## WATER LEVEL, IN FEET ABOVE LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	276.80	DEC 05	280.90	FEB 05	281.5	APR 05	281.5	JUN 15	265.3	AUG 20	258.4
10	279.10	10	279.70	10	282.6	10	283.8	20	266.5	25	263.0
15	280.30	15	278.00	15	284.9	15	283.8	25	260.7	31	264.2
20	280.30	20	276.80	20	284.9	20	279.1	30	263.0	SEP 05	267.6
25	282.60	25	276.80	25	283.8	25	281.5	JUL 05	263.0	10	267.6
31	281.50	31	276.80	28	286.1	30	280.3	10	261.8	15	265.3
NOV 05	281.50	JAN 05	279.1	MAR 05	281.5	MAY 05	278.0	15	258.4	20	258.4
10	281.50	10	279.1	10	286.1	20	267.6	20	258.4	25	265.3
15	281.50	15	279.1	15	282.6	25	264.2	25	259.5	30	264.1
20	279.10	20	280.9	20	283.8	31	263.0	31	256.1		
25	279.10	25	281.5	25	283.8	JUN 05	262.4	AUG 05	257.8		
30	281.50	31	281.5	31	284.1	10	263.0	10	256.1		

NOTE: Instantaneous observations are minimum height above land surface.



## GROUND-WATER LEVELS

## LINCOLN COUNTY

431619096460202.

LOCATION.--Lat 43°16'19", long 96°46'02", in NE¼NE¼NE¼ sec.32, T.98 N., R.50 W., Hydrologic Unit 10170102, 4 mi south of Worthing. Owner: South Dakota Department of Water and Natural Resources.

AQUIFER.--Dakota.

INSTRUMENTATION.--Digital water-level recorder -- 60-minute punch.

WELL CHARACTERISTICS.--Drilled observation artesian well, diameter 6 in, depth 383 ft, screened 363 to 383 ft.

DATUM.--Elevation of land-surface datum is 1,320 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder platform 3.0 ft above land-surface datum.

PERIOD OF RECORD.--August 1979 to current year.

## WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	161.30	161.21	161.48	161.26	161.78	162.01	162.22	162.47	162.94	163.26	164.88	165.11
10	161.32	161.27	161.24	161.35	161.82	162.07	162.42	162.54	162.99	163.41	164.97	165.17
15	161.22	161.35	161.18	161.36	161.89	162.08	162.46	162.57	163.02	163.55	164.96	165.23
20	161.12	161.53	161.11	161.53	161.92	162.13	162.41	162.66	163.15	164.57	165.03	165.14
25	161.21	161.41	161.17	161.58	161.94	162.19	162.42	162.76	163.17	164.63	165.06	---
EOM	161.21	161.35	161.22	161.67	162.03	162.26	162.48	162.74	163.22	164.84	165.11	---
MAX	161.33	161.53	161.48	161.45	162.03	162.26	162.48	162.79	163.22	164.84	165.19	---

WTR YR 1985 HIGH 159.35 JAN 18

NOTE: Instantaneous observations are the maximum depths below land surface.

## MARSHALL COUNTY

454745097450401.

LOCATION.--Lat 45°47'45", long 97°45'04", in SE¼NE¼SE¼ sec.23, T.127 N., R.58 W., Hydrologic Unit 09020105, within city limits of Britton. Owner: City of Britton.

AQUIFER.--Dakota.

INSTRUMENTATION.--Digital water-level recorder -- 60-minute punch.

WELL CHARACTERISTICS.--Drilled unused public supply artesian well, diameter 8 in, depth 1,060 ft.

DATUM.--Elevation of land-surface datum is 1,360 ft above National Geodetic Vertical Datum of 1929. Measuring point: Top of recorder platform 2.50 ft above land-surface datum.

PERIOD OF RECORD.--July 1970 to current year.

## WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	43.32	42.85	43.08	43.11	43.52	---	42.95	43.10	43.07	42.91	43.13	42.92
10	43.32	42.92	42.98	43.53	43.42	---	43.18	43.07	43.11	43.19	43.45	43.07
15	43.13	42.92	42.91	43.32	43.35	---	43.10	43.07	42.86	43.35	43.21	43.02
20	42.94	43.09	42.94	43.49	43.30	---	42.94	42.97	42.98	43.42	43.23	43.09
25	43.12	42.94	43.11	43.37	43.20	---	43.02	43.10	42.99	43.23	43.15	42.98
EOM	43.14	42.79	43.20	43.49	---	43.19	43.14	42.89	43.05	43.45	43.01	43.11
MAX	43.41	43.15	43.20	43.56	---	---	43.29	43.28	43.11	43.72	43.45	43.12

WTR YR 1985 HIGH 42.75 NOV 27

NOTE: Instantaneous observations are the maximum depths below land surface.

## SULLY COUNTY

SITE NUMBER 443340099550801 LOCAL NUMBER 113N76W31BBBB

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 24, 1985	4.40	JUN 06, 1985	4.11	AUG 15, 1985	4.46

SITE NUMBER 443433099551201 LOCAL NUMBER 113N76W25AAAA

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 20, 1985	38.60	JUN 06, 1985	33.18	AUG 15, 1985	44.34

SITE NUMBER 443439099535901 LOCAL NUMBER 113N75W19DDDD

## WATER LEVELS, IN FEET BELOW LAND SURFACE DATUM

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19, 1985	14.85	JUN 06, 1985	14.74	AUG 15, 1985	15.16

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## FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI). This report contains both the inch-pound and SI unit equivalents in the station manuscript descriptions.

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	$2.54 \times 10^1$	millimeters (mm)
	$2.54 \times 10^{-2}$	meters (m)
feet (ft)	$3.048 \times 10^{-1}$	meters (m)
miles (mi)	$1.609 \times 10^0$	kilometers (km)
<i>Area</i>		
acres	$4.047 \times 10^3$	square meters (m <sup>2</sup> )
	$4.047 \times 10^{-1}$	square hectometers (hm <sup>2</sup> )
	$4.047 \times 10^{-3}$	square kilometers (km <sup>2</sup> )
square miles (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometers (km <sup>2</sup> )
<i>Volume</i>		
gallons (gal)	$3.785 \times 10^0$	liters (L)
	$3.785 \times 10^0$	cubic decimeters (dm <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic meters (m <sup>3</sup> )
million gallons	$3.785 \times 10^3$	cubic meters (m <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
cubic feet (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeters (dm <sup>3</sup> )
	$2.832 \times 10^{-2}$	cubic meters (m <sup>3</sup> )
acre-feet (acre-ft)	$1.233 \times 10^3$	cubic meters (m <sup>3</sup> )
	$1.233 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
	$1.233 \times 10^{-6}$	cubic kilometers (km <sup>3</sup> )
<i>Flow</i>		
cubic feet per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liters per second (L/s)
	$2.832 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$2.832 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
gallons per minute (gal/min)	$6.309 \times 10^{-2}$	liters per second (L/s)
	$6.309 \times 10^{-2}$	cubic decimeters per second (dm <sup>3</sup> /s)
	$6.309 \times 10^{-5}$	cubic meters per second (m <sup>3</sup> /s)
million gallons per day	$4.381 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$4.381 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
<i>Mass</i>		
tons (short)	$9.072 \times 10^{-1}$	megagrams (Mg) or metric tons



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